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ASSISTANCE TO THE TEXTILE LABORATORIES AND DESIGN CENTRE*

DP/SYR/72/010

SYRIA.

Technical report: Fabric design

Prepared for the Government of Syria by the
United Nations Industrial Development Organization
executing agency for the United Nations Development Programme

Based on the work of D.R. Hargraeves, expert in fabric design

United Nations Industrial Development Organisation
Vienna

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SUMMARY

Concentrated effort throughout the year has effectively provided the impetus to get the initial training and fabric development programme off the ground. It is now necessary for an effective and conscientious follow-up to ensure continued growth and expansion. First priority must be given to instruction in sample production, as a nine-month delay in providing looms at the Centre has hampered the start of training in practical work. However, this can be compensated for somewhat by an intensive effort in the first few months of 1978.

An interest in the artistic side of textile designing is very pronounced, but determined measures along the lines already indicated are required so that basic contributions to an improvement in both quality and production standards, can be made in the initial stages of fabric development in the design studio.

The local market, although quite traditional in many ways, gives indications of rapid changes. Therefore, much more attention is necessary in the development of new designs and the projection of style and colour trends.

The general administration of the Project as a whole has indicated decision making, which either lacks the necessary

experience for an undertaking of this magnitude, or is encountering obstacles which are proving very difficult to overcome. Under the circumstances it would appear imperative that specialised guidance is made available in order to ensure that the programme of fabric development, research and testing, develops along the right lines and that the Centre reaches its full potential in two years or less.

Opportunity for self-expression should be allowed to find its way into the designing programme, and the copying of styles must gradually give way to the creation of designs from ideas originating with visits to markets, both locally and overseas. Merchandise meetings, open discussions and the total involvement of each designer in the planning of new season's ranges will be found to constitute the best method of developing personal initiative, and also allow the young designer to learn from the more experienced.

When pilot production machinery is in full operation and sample manufacturing has been established on a regular and permanent basis, new styles will be prepared and woven according to a planned schedule. After finishing, they will be tested and evaluated. Any designs which cause problems at any stage during sample production will be either modified or not included in the new range. The same procedure will be followed for knitted and printed fabrics. All apparel fabrics whether woven, knitted or printed, should be planned in a co-ordinated colour range each season so that each set of

designs will enhance the sales appeal and marketability of the others.

Lack of communication between individual firms, senior management and the various Government departments has apparently been causing major difficulties for several years. Indications are that efforts being made to overcome this are meeting with considerable resistance to change. Seminars should be held at the Centre attended by top management, and every effort made to create an atmosphere of close collaboration with a free and open discussion and exchange of ideas. In this way the barriers to a free-flow of information, beneficial to the industry as a whole, will be quickly broken down.

The long delays experienced since the project was first conceived during the latter part of 1973 are certain to have created a bad public image, and lack of information with regard to the reasons for the delays and disruptions has not helped the situation. Strenuous efforts must now be made to change this position quickly. The planned objectives of increasing productivity and improving existing technology can only be achieved if the Centre assumes its rightful role of leadership and becomes a showplace for the Union of Textile Industries.

The manual on Woven Fabric Design and Development was completed on December 31, 1977. **It has been issued as a separate technical report (DP/TD/SER.A/123).**

Arrangements are already in hand for the translation of the manual and a letter has been sent to the Director General of the Centre suggesting how the manual can be put to best use.

In concluding this final report it should be mentioned that the first of the Diedrich sample looms started sample production on December 31, 1977. A cotton warp suitable for weaving small twills and herringbones has been mounted in the loom and trials carried out so that final adjustments to the loom can be made. The second warp is in the process of being entered in the Verdol jacquard loom and this should be weaving very soon. This is a very good start to the new year and will certainly mean that in the last two weeks of the assignment some training in practical weaving can take place.

INTRODUCTION

In compiling this final report all the factors which have influenced the progress and implementation of both the immediate and long-term objectives of the project have been taken into consideration.

The main features deal with the work in the Design Studio and inter-related areas, and also the activities of the Fabric Design Expert, Mr. D. R. Hargreaves, L.T.I., since his arrival at the Textile Laboratories and Design Centre towards the end of January, 1977.

Basic Reasons for Establishing the Project:

The project Assistance to the Textile Laboratories and Design Centre (SYR/72/010/A/01/37) was conceived during the latter part of 1973. At that time the Syrian textile industry was facing major difficulties. There was a lack of standards from raw materials, through all production stages to the finished product. Apparently, absence of communication in terms of assessing results correctly between individual firms, senior management and the various government departments, was seen as being one of the major contributory factors.

National planning had focused attention on the development of the textile industry. In previous years the textile sector

had shown a growth of ten per cent per annum and was accounting for forty per cent of the total industrial output. Quite naturally, therefore, the problems being encountered were becoming more acute and required immediate attention if the rate of growth was to be sustained and improved.

Action Planned to Remedy the Situation:

It was decided after an intensive study of the industry as a whole that the way to get at the root of the problem was to establish a textile laboratory and design centre. The new project would meet the needs for quality control in the industry, establish standards and ensure that they were met and maintained. It would also provide technical education facilities for the training of personnel. Experimental work would be carried out on pilot production machinery and a design studio established, which would be involved in fabric development work, the production of samples in both woven and knitted cloth and the styling of new print designs. The new centre would also be responsible for the corelation of results and the selective dissemination of technical information throughout the industry.

Project Inception:

As a result of this decision funds were allocated from the U.N.D.P. Country Programme for the establishment of the new centre and the Project Document drawn up and signed by representatives of the Syrian Government and the U.N.D.P. on

actual date of signing was June 22, 1974 and work on the construction of the buildings was expected to commence exactly four months later in October.

All details for the layout of the building had been given to the consulting engineers before Mr. Midsvik compiled his report, and specifications had been drawn up for power, water, steam and lighting requirements. Data regarding the floor space necessary and the weight of each of the different pieces of equipment had also been worked out and included.

Machinery and Equipment Selection:

A comprehensive list of equipment required throughout the centre was also ready in July, 1974 and recommendations were made that orders should be placed as soon as possible, especially as some of the machines recommended for the pilot plant were not ordinary production units and, therefore, delivery may take more than one year. In light of subsequent delays in the delivery of new machinery it would appear that these recommendations were not taken seriously.

It was estimated in Mr. Midsvik's report that the building of the centre would be completed and ready for occupation by the end of 1975 and delivery of pilot machinery and equipment could commence at that time. However, the Project Document indicates a starting date for the erection of the building as June, 1973, with the new premises ready by January, 1975.

So, even at the planning stage, discrepancies in the timing had already started to arise.

Arrival of U.N.I.D.O. Experts:

The Fabric Design Expert and the Textile Dyeing and Finishing Expert, who were to provide technical assistance and help in supervising the centre's activities, were scheduled to arrive during January, 1975 on a one-year assignment. Their planned date of arrival was postponed several times, however, and the Fabric Design Expert finally arrived at the duty station on January 27, 1977, followed about two weeks later by Mr. Alan Thorp, the Textile Dyeing and Finishing Expert.

At the pre-mission briefing in Vienna with Mr. Antero Eraneva, Senior Industrial Development Officer, Agro Industries Section, the Fabric Design Expert was shown a letter from Mr. Jack Woolfenden, A.T.I., Expert in Textile Testing, Standardization and Quality Control. Mr. Woolfenden who was working at the Industrial Research and Development Centre in Nezza (Proj. SYR/72/006/11-05/08 (06)) which also has physical and chemical testing facilities for textiles, had visited the new Textile Laboratories and Design Centre at the beginning of December, 1976 in company with his project manager, Dr. Shaaban. They met Mr. Djubrini, the director of the centre, who explained in detail the situation at that time. Mr. Woolfenden's letter was very helpful in preparing the way and gave a good indication of the progress which had been made.

the thirteenth of January, 1974.

The Project Document clearly stated both the immediate objectives of the scheme and the long-term targets. The Government's plan for the rationalization and modernization of the industry over a number of years being entirely dependent on the rapid establishment of consistent testing and quality control methods. Also, realistic standards must be set up, taking into account the raw materials and machinery available in the industry.

Preliminary Survey:

U.N.D.P. and Government inputs are clearly outlined and the assignment of international staff by the former was planned to commence with the arrival of Mr. Ola J. Eidsvik, a Textile Engineering Expert from Canada, in January, 1974. He was the consultant responsible for equipment selection and his duties involved the drawing up of neutral specifications for the equipment to be purchased under the U.N.D.P. contribution to the project. Mr. Eidsvik was in Syria during the month of June, 1974 to do this preliminary survey work and his findings and recommendations were submitted to the Government in a detailed report dated July 2, 1974.

At that time the contract between the Union of Textile Industry in Syria and the contractors who were to erect the Textile Laboratories and Design Centre had already been signed. The

Location of Centre:

The buildings for the new research centre are sited in Ghouta, about 15 kilometres outside Damascus. The area is semi-rural with several textile mills operated by the Union spread out among intensively cultivated farmland. As the area is also quite heavily forested the various industrial establishments are not immediately obvious, even though some of them are quite large. Also, quite a lot of attention is made to landscaping and this feature hasnot been overlooked at the centre, although it will obviously take several seasons for the gardens to establish themselves.

SITUATION AT THE COMMENCEMENT OF THE ASSIGNMENT JANUARY 27, 1977

According to the starting dates quoted in the Project Document on pages 13 and 14 activities were moving very slowly and the scheme was about two years behind schedule. The structural work of the main buildings was complete but mains electricity had not been connected. Work was proceeding on the laying of an underground cable to the centre from the nearest supply point about 4 kilometres away. It was said that the work was in its final stages but it still took a considerable length of time to complete. During the time that the centre was without mains power arrangements were made for a connection with the nearby nylon plant which has its own generators. An auxilliary mobile generator was also in use.

The Design Studio:

In the Design Studio the room was completely vacant. An office with three small desks was provided for the use of the Design Expert, the Director of Weaving and Design, Mr. Haitham Kabakibo, and the lady in charge of Print Design, Mrs. Theran Bellan. In the rest of the building most rooms were empty, apart from the carding room which contained carding and spinning machinery still crated. The physical and chemical testing laboratories were also full of U.N.D.P.-supplied equipment but this was still standing on the floor unpacked.

Recruitment of local staff was underway but a competent English typist had not been found, nor was there a typewriter available other than the one with Arabic script. Stationery was almost unobtainable and most things in general were completely disorganized.

Transport and Communications:

No telephone communication was available other than the internal system, and there was no project car, even though the centre is a considerable distance from the city. Obviously, no thought was given to the position of the Experts in the event of an emergency and the Design Expert had no possibility of communicating with his family while away at the centre in the event of such circumstances arising.

WORK PLANNED AND IMPLEMENTATION OF PROJECT OBJECTIVES DURING THE YEAR

January 27 - February 26, 1977:

1) Equipping the Design Studio:

The first priority was to get the equipment for the Design Studio in order that a practical programme of fabric development could be started. Immediately, a list of the necessary items was drawn up and after discussions the Director of Weaving and Design took the list in order to start procurement procedure. Among the equipment ordered were 2 drawing boards with stools, 4 examining tables illuminated from underneath, 2 desks, 2 filing cabinets and a cupboard, and all the necessary graph paper, tracing paper, drawing instruments, coloured pens, paints, brushes and other small items.

2) Preliminary Evaluation of Counterparts:

The next step was to spend some time evaluating the capabilities of local counterpart personnel, in light of their proposed duties and responsibilities. All had had some technical education in the elementary principles of textile manufacturing and this was a good base on which to expand their knowledge. All the people who are involved in Design Studio work were tested for colour-blindness at the Design Expert's suggestion and this procedure is to be followed when any new people are recruited.

Sample books were obtained from one of the mills. These had

originated in France in 1971 and, although the styles were outdated, they did serve a useful purpose in giving practice in the analysis of fabrics. Approximately 60 different designs were analysed for weave and construction details by local counterparts under the supervision of the Fabric Design Expert. Discussions were held about each style and any particular features or characteristics explained. Any mistakes were corrected and a system for checking for errors in the weave and draft instituted in order to eliminate future problems.

3) Planning Meeting to Discuss Work Objectives:

Also in February a meeting was held, together with Mr. Djubrini the Director of the centre and Mr. Thorp, the Dyeing and Finishing Expert, to discuss various problems, areas of responsibility and work objectives. It was also suggested to the Director of the centre that, due to the lack of equipment and the delays it was causing, it would be a good idea if the Experts were to visit all the Syrian textile mills in Damascus, Homs, Hama, Aleppo, Latakia, Idlib and Deir el Zoor. The proposed visits were to enablean assessment of production and quality control problems to be made. Then recommendations could be made as to what should be the first priorities when the centre starts to fulfil its projected functions.

The question of transport being provided for the Experts was discussed, but the Director stated that he thought the bus provided was adequate and strongly opposed the provision of a project car, which could have been provided with money available in the I.P.F.

4) Meeting at State Planning Commission:

On February 17 a meeting was held at the offices of the Syrian State Planning Commission to discuss the progress being made at the centre. The U.N.D.P. was represented by the Resident Representative a.i. Mr. H. Basri Danisman, Dr. Yehya Kassab, Programme Officer responsible for the project, and Dr. M. A. Shaaban, Project Manager from the Industrial Research and Development Centre. Both the Fabric Design Expert and the Dyeing and Finishing Expert attended and were required to give detailed reports of their activities and work progress. Again the subject of a project car was raised and again the director of the centre made it quite clear that he did not think it was necessary.

5) Mill Visits:

Also during the month a visit was made to Khoumassieh Mill which is on the outskirts of Damascus, on the road to Aleppo. This is the largest manufacturing unit in Damascus and is completely vertical, having its own opening, carding and spinning, preparation, weaving, dyeing and finishing, and printing.

A wide variety of designs were being produced including shirtings and dress fabrics, household linen, and lightweight bedfords and twills for printing. Gauze fabrics were also being woven in a special lightweight tent fabric for use during the hot summer months. Yarn counts employed were in the range 2/30s English cotton to 5/8s English cotton count, the latter being used in the manufacture of heavy canvas ducking.

The plant also has a large design studio for the production of prints and has equipment for the photographic processing of print designs.

February 27 - March 26, 1977:

6) Training in Fabric Analysis:

During this period theoretical training of Syrian counterparts continued with more instruction given on fabric analysis. The importance of this work was explained and how concentration and attention to detail enabled the designer to build up a wide knowledge of weave construction and a thorough understanding of fabric design. Fabrics were also being prepared for weaving at this time, although the work was still hampered by the lack of proper facilities and it was the end of March before the equipment ordered for the Design Studio was finally delivered and put to use.

7) Preparation of Preliminary Report:

At the beginning of March a letter was forwarded to the Director of the centre requesting:-

a) A complete list of all machinery and equipment which had been delivered.

b) A complete list of machinery on order and expected date of delivery.

c) A list of machinery for which orders still needed to be placed and an approximate date on which these were expected to be finalised.

d) A date when dyeing, finishing and printing machinery was expected to be delivered and ready for use. This was in order to draw up a timetable for the commencement of print design production in the Design Studio.

e) A date when the equipping of the chemical laboratory with benches, fume cupboard, and other apparatus would be completed.

f) Expected completion date for the physical testing laboratory and when practical work could commence.

g) A prospective date when an itinery could be worked out for the Experts to visit millsoutside of Damascus.

At the end of the letter the Fabric Design Expert volunteered to assist Mrs. Tharan in the typing of the Director's reply, as she was taking care of the translation of all information and discussions involving the sample and design area.

The reason the above was requested was that the Fabric Design Expert was preparing his preliminary report and wanted to provide a clearer picture of the situation at the centre. Unfortunately, no reply was ever received and this has not helped in the planning of work schedules.

e) First Delays in Obtaining Basic Equipment:

At the beginning of the assignment the Experts were told that workbenches for the physical laboratory would be delivered shortly, but they did not arrive until the end of May. Benches

for the chemistry laboratory, which have been promised at various times throughout the year, have still not arrived.

9) Possibility of borrowing Weaving Machinery from Local Mills:
On March 21 a discussion was held with the Director of Weaving and Design regarding the training programme and work plan in the sample and design area. The following day a memo was passed to him to clarify the points discussed. Again, specific information was requested regarding delivery dates of production machinery, but it was not forthcoming.

It seemed a good idea that if the new looms and preparation machinery for the weave room were going to be a long time in arriving, the centre should try and borrow two or three looms, a warping machine and a pirn winder from one of the mills. According to what had been said during visits to mills, there were looms standing at several plants due to a labour shortage. The urgency of the matter was pressed very strongly and it was pointed out very clearly how much more could be accomplished in the way of practical work and training in sample production once looms were obtained for the centre. It appeared certain that these could be obtained within two weeks and be in place and running by the end of the month.

10) The Design Programme and Fabric Samples:
Samples of fabric and yarns from local mills were requested. These were to be used as a basis for the design programme and to familiarise the designers with the types of fabrics already

in production. Immediate objectives were then to produce similar types of fabric, improve design and quality and gradually introduce changes in styling. If the design studio suddenly started to produce fabrics completely different and using yarn counts which were not being spun, the abrupt change in direction would cause complete chaos in the mills.

March 27 - April 26, 1977:

11) Arrival of Equipment for the Design Studio:

The design studio was now fully equipped and work proceeded with the analysis of worsted suitings, shirtings, dress fabrics and leisurewear. New books containing samples of currently popular designs in France and Italy had been bought by the centre and these were to be the basis of all future fabric developments. According to information available, the question mentioned earlier of getting looms on loan from one of the mills, had been gone into and machinery would be arriving shortly. So plans were made to start sample production and details prepared for several new designs so that they would be ready for weaving trials to commence. At this time, early on in the assignment, it appeared quite possible that serious attempts were being made locally to obtain production machinery and that the intention was to get this in place and running as quickly as possible.

12) Further Visits to Local Mills and Attempts to Obtain a SWL Sample Loom on Loan:

More visits were made to local mills by the Experts. Two

worsted mills were seen, one running on the production of piece-dyed semi-plain fabrics in both 100% wool and 55% polyester/45% wool blends. This particular mill had an SWM sample loom which is a very versatile piece of equipment for producing a wide range of fancy designs. It represents a most ideal method of pattern weaving with the capacity of producing an unlimited number of predetermined textures in widths of 2" to 20". The design can be changed quickly by simply cutting new design cards and changing the position of the different contact plugs on the electrically operated selecting board or matrix.

This sample loom was not being used too frequently, as its greatest advantage is in the production of fancy designs. Whilst the mill where it was located was running almost its entire production on plain or semi-plain styles. A suggestion was made by the Fabric Design Expert that if the loom could be moved to the Centre on loan for a little while it would be an excellent opportunity to give local counterparts some practical experience in sample production. The loom is only 170cm x 160cm x 135cm and weighs 325 Kgms, so it would be a simple matter to transport it to the Centre, a distance of about 4 kilometres. It was agreed that this was a good idea, especially as the Director of Weaving and Design was planning to buy one of these looms. It would also certainly be prudent to have the opportunity of evaluating one at first hand and to understand its full capabilities before placing an order.

given that by far the biggest problem was shortage of labour.

16) Project Audit and Inspection:

At the beginning of May Mr. J. A. Lucas, an auditor of the United Nations Internal Audit Service, arrived in Damascus to carry out a 3-day audit and inspection of the project; and audit and inspection questionnaire having been filled out by the Experts previously in preparation for this visit. A check of U.N.D.P. non-expendible equipment was carried out first; then a long meeting was held in the library at U.N.D.P. offices to discuss the progress made in implementing the project work plan.

It was very obvious at this time that the need to more closely align the timing of inputs such as Experts' services, with the ability of the project to utilise them, was an important item warranting management level attention. This was emphasised in Mr. Lucas's subsequent report. However, the changes in the work schedule being made by the Experts in order to overcome the severe problems being cause by the delay in Government inputs were found to be moves in the right direction and met with full approval.

17) Submission of First Quarterly Report:

The Fabric Design Expert submitted his first quarterly report on May 16 and at this time work in the Design Studio was going well and producing meaningful results. It was still, however, rather too early in the project as far as the Experts' assignments were concerned to assess the progress being made towards achieving the project's objectives. Also, it was already felt that considerable

obstacles were going to be encountered before the Centre could build up to full capability. Since explanations for the delays in Government contributions were not forthcoming, the experts' services were being made available in whatever manner they would assist the project best and adjusted weekly to meet the changing circumstances.

18) Reference books and Technical Magazines required:

A list of books and technical magazines dealing with designing, fabric development, and textile manufacturing, was drawn up and given to the Director of the Centre. It was suggested that these should be obtained for the new library which was being planned. They would also prove to be very useful in the training programme and for future reference.

19) Erection of First Machinery:

Technicians arrived to erect the opening and blending line for cotton, the Nergeth Sample Warper and Slasher, the high-speed intersecting gill-box. This work was quickly completed and all the machinery was test run except for the cotton opening and blending line. This was found to be damaged and is still awaiting spares at the time of writing.

Mr. A. G. Shagashirov one of the design technicians at the Centre, was trained in the operation of the Nergeth sample warper, which is quite a complicated piece of electronic machinery. It can dress automatically any pattern in any colour combination up to ten

13) Preparation of Samples for Weaving:

Accordingly, preparations were made in order that some designs would be ready for weaving trials when the loom arrived. It would certainly have boosted morale to quite an extent if at that time the trainee designers had been able to get away from the paperwork for a while and see some of the designs they had analysed and worked on reach the production stage. A period of three to four weeks went by without any further news and then after the arrival of the loom had been expected any day, the Director of Weaving and Design announced that the loom would not be coming to the Centre as an order had already been placed for a new one.

14) Print Designing:

The two designers working on prints were kept very busy copying designs. Sample books, again from France and Italy, had been bought and styles which were thought to be suitable for the local market were selected. The outline of the print was carefully traced and then various colourways painted out. The finished designs were then sent out to local mills for printing.

April 27 - May 26, 1977:

15) Continued Mill Visits:

The visits to mills by the Experts continued during this period. These served to get an idea of the type of fabrics being manufactured, type of production machinery in use, and the general picture of the industry built up. However, when questions were asked regarding production and quality problems, the answer was

colours and is a very valuable piece of equipment to have in any sample manufacturing operation. Once it has been set up properly it virtually eliminates human error.

This period in the assignment was one of great optimism. Some machinery was now in place and there was every indication that more would be arriving any day. It appeared that it would soon be possible to progress from the theoretical training stage to the more practical aspects of fabric development and sample manufacturing.

2d) Expansion of Design Work:

In the Design Studio work was being expanded to encompassmore complicated fabrics and constructions. The print designers were kept very busy and were also away from the Centre quite often helping with the design work at the local mills. It was at this time that Mr. F. Said, the second of the technicians working of the development of woven fabrics announced that he was leaving the project. This was an unfortunate decision as he had been working in the Design Studio from the very beginning. He had always been very interested in the project and had shown distinct promise in the development of hisdesigning abilities.

Some interruptions to the work schedule were experienced when the contractors who were responsible for the building construction had to be recalled to repair cracked plaster work on

the walls and re-enforce the light fittings, some of which had worked loose.

May 27 - June 26, 1977:

21) Arrangements for new Designs to be woven:

After the departure of Mr. Caid, Mr. Shagashirow worked very hard indeed to ensure that the programme of work did not slow down too much. However, there was only one designer other than the Fabric Design Expert working on the development of woven fabrics, the position of Director of Weaving and Designing apparently being a purely administrative one. Fortunately the Hergeth sample warper was not being used during this period, otherwise Mr. Shagashirow would have been fully occupied operating it.

At this stage quite a large number of new designs which had been analysed and prepared were sent out to be woven in the local mills. Also, arrangements were made by the Director of Weaving and Designing for some new fabrics to be produced at a mill in Aleppo.

22) Evaluation of New Samples:

It was stressed that samples of the new styles should be returned to the Centre for evaluation and testing after they were finished. This was agreed as it was the intention of the Fabric Design Expert to discuss each new sample, suggest further developments and possible improvements, and start a filing system for finished samples. It is essential that complete specifications for all new fabrics are properly recorded and suggestions for a range sheet,

a typical example of which appears on Page 78 of the manual on textile design prepared by the Fabric Design Expert, were put before the Director of Weaving and Design. The keeping of accurately detailed records of all the work done in the Design Studio has been stressed very strongly throughout the assignment.

23) Erection and Test Running of the Rectilinear Comb:

In June a technician came from Heberlein, Hispano S.A., Geneva, to erect and test run the Hispano Rectilinear Comb supplied as part of the U.N.D.P. input. This work was completed within a few days, although the test running proved very difficult due to the presence of large amounts of static electricity. The wool tops provided for the running test were old and very dry, and also the air conditioning and humidification system in the spinning room was not switched on because it had not been tested under summer conditions. The Hispano technician, however, fixed up a system to add oil and anti-static agents to the tops by means of a small bath and immersion roller, the humidification system was turned on and test running was conducted successfully.

As the Fabric Design Expert was now reaching the half-way stage in his assignment, and some of the pilot production machinery was ready to start up, it could be said that satisfactory progress was being made in certain areas. However, despite constant reminders about the looms and promises that they would be arriving soon, it was still a matter for some conjecture and concern as to when practical training in sample manufacture could start.

Also, the sense of urgency regarding this matter expressed quite frequently by the Fabric Design Expert was not apparently shared by the people concerned in obtaining the looms.

24) Origination of Print Designs:

The production of print designs was proceeding at a considerably increased rate. However, the procedure was still to copy. The Fabric Design Expert explained that it was very necessary for the print designers to be given an opportunity to show their abilities in the production oforiginal designs. However, the reply received was that it had always been the policy to copy print designs which have been bought in Europe for that specific purpose, and that this procedure would remain unchanged. It was pointed out that there was a danger of copyright infringements in this method of working. Also, attention was drawn to the notice in the front of the sample books which says that, "All the samples published are the property of the original designer, and cannot be reproduced," but evidently, this is not considered important.

June 27 - July 26, 1977:

25) Training in Sample Warp Dressing:

Plans for the start of sample production and practical training were still being delayed due to the non-arrival of looms which had been promised in March. In the preparation area sample warps were being dressed in order to give Mr. Shagashirow more experience in operating the electronic warping machine. This of

course interrupted the training schedule in the Design Studio as far as the development of woven fabrics was concerned, because a replacement had still not been recruited to fill the vacancy left by the departure of Mr. Caid.

26) Appointment of Project Manager a.i.:

Mr. Thorp, the Textile Dyeing and Finishing Expert, was appointed Project Manager a.i. and assumed the duties of general administration and managerial responsibility for the project during the month of June. This was an excellent move aimed at solving the problems which were being encountered. It also served to prevent duplication of work and the overlapping of areas of responsibility. Up to this point both experts had been sharing the duties which should have been the responsibility of a Project Manager.

A tri-partite meeting was scheduled for early August and a review of the work programme and training schedule in the Design Studio was carried out in preparation for a verbal report which was to be given at this meeting.

27) Crepe Weaves and Production of Prints at Local Mills:

The design of a crepe weave was analysed as it had been decided to use this for curtains which would be woven for the Centre as soon as the looms had arrived and had been installed. While working on crepes, methods of designing special crepe effects and making seersucker fabrics were explained. Also shirting fabrics involving reeded effects and shadow strip were analysed and specifications prepared for manufacture.

A number of print styles which had been designed at the Centre were being produced at one of the local mills and the two designers who had worked on them visited the mills to supervise the first strike offs.

28) Arrival of Counterpart in Knit Technology:

Towards the end of July Eng. Saied Sheik Saied started work at the Centre. He had studied knitting technology for several years in the Soviet Union and will act as assistant to the Director of Weaving and Design in the administration of the sample and design work and also supervise knit designing and the running of the knitting machines.

29) Expansion of the training programme:

The training programme so far, although being mainly theoretical, had been planned in such a manner as to provide as much information as possible covering a wide range of different types of fabrics, bearing in mind the demands of the local market. At the end of June a lot of cloth samples arrived from the United States together with the Fabric Design Expert's books and personal effects. Then a meeting was held to show these swatches to counterparts and to discuss the different types of fabric and end use. The samples included both woven and knitted, apparel and upholstery designs.

July 27 - August 26, 1977:

30) The Tri-partite Review:

Probably the most important occurence during this period was the Tri-partite Review held at the Centre on August 4. During the discussions, which were conducted in Arabic, it was recognised that establishing a new research centre is a very lengthy and time-consuming process, and apparently the majority of the people present were quite satisfied with the progress which had been made. The fact that the project was more than two years behind schedule and further delays in project activities were being experienced due to the delays in the delivery of pilot processing machinery, did not appear to give cause for undue concern. In fact, the Director General of the Centre stated clearly that it would need ten years before activities at the Centre would begin to effect a substantial impact on the textile industry in Syria and other Arab countries. No reason was given for the long delay in obtaining looms from local mills and still no information was available as to when all machinery would be in place and running. Progress in achieving project objectives were generally described as being satisfactory, some notable steps had been taken, and things in general were moving along on the right lines.

The Director General also made it quite clear that no further assistance with respect to expertise would be required from UNDP/UNIDO. This means that there will be no expert supervision available during the vital period when production machinery is being commissioned, to assist in bringing the physical facilities

to such a level where they can provide the necessary assistance to industry in making improvements in quality and standards.

31) The Six-monthly Report:

The preparation of the Fabric Design Expert's 6-monthly report was carried out and this was finalised shortly after the Tripartite Review. Questions which were discussed at the review and which were liable to have a significant effect on progress and achievements in the area of design and fabric development were assessed and taken into account when the report was made out. It was also noted that the transportation situation remained just the same and there was still no means of outside telephone communication. This meant that any business which had to be done at U.N.D.P. or visits to the bank, etc. entailed leaving the Centre.

32) Personnel Changes:

About the middle of August Mr. Shagashirow, who was going on vacation, announced that he would be leaving the project altogether He had been successful in applying for an opening at a university in the Soviet Union where he proposed to spend five years studying Textile Technology. This was a big loss as far as work in the sample and design area was concerned. He had always worked very hard indeed and was easily the most learned of local counterparts as far as styling and fabric development was concerned. With a very good understanding of English and a keen desire to learn, he had always demonstrated great interest in project work and activities.

August 27 - September 26, 1977:

33) Recruitment and Arrival of New Local Counterparts:

As a result of Mr. Shagashirow's departure there was no-one left at the Centre to work with the Design Expert on woven fabric design. However, the production of new print styles continued. Then, in September, after the Design Expert returned from vacation four new people had started work in the Design Studio. Mr. Abdoulah Mukabak and Miss Jada Hadro, both trained in the elementary principles of weaving and designing at the Institute of Weaving Industry in Damascus, were to be the replacements for Mr. Said and Mr. Shagashirow in woven fabric development. Mr. Fareed Barjass and Miss Zenab Dawoud had been added to the strength of the print design team.

34) Preparation of a Manual on Fabric Design and Development:

It was now necessary to start the training programme at the beginning again for the benefit of the newcomers. Due to the changes in personnel at this point the Design Expert decided that a permanent record ought to be provided in the form of a manual on the subject of fabric design and development. This would remain available at the Centre and reference could be made to it at any time when problems were encountered. It would also ensure a continuation of the training programme after the Fabric Design Expert's departure. More important, all the technological and administrative information which had been made available would not be lost with any future changes in personnel.

Work on the preparation of the Design Manual commenced in mid-August, after the idea had been discussed and approved at the tri-partite meeting. Due to the tremendous amount of technical information which needed to be included in the manual and the fact that 68% designs had to be graphed in triplicate, one set for each copy, a lot of the work had to be done during the evenings and at weekends at home.

An english-speaking secretary started work at the Centre in September but as there was also a manual to be typed on the Testing and Evaluation of Chemicals and Dyestuffs and also letters to be done for the project manager a.i. referring to the administration of the project, there was suddenly a tremendous amount of typing work to be got through in a very short time. However, thanks to the very valuable voluntary help of the Design Expert's wife in the layout and typing of the Design Manual the work was completed on time. As the typing was done for the most part on a portable typewriter it is unfortunate that only three copies could be made, but the manual and the designs were all prepared in such a manner as to facilitate foto-copying.

It should also be mentioned at this point that after the arrival of the new english-speaking secretary renewed efforts were made to obtain a project car. However, once again many difficulties were encountered.

35) Arrival of the First Looms and Winding Machinery:

At the beginning of September three Diedrich 125 looms and an

Optima pirn winder with ten spindles were delivered to the Centre from one of the mills in Aleppo operated by the Textile Union. It is regrettable that it took eight months to get these looms; however, they were a very welcome addition to the equipment in the sample and design area. It seemed that, at last, it would be possible to start weaving fabric samples.

Shortly after the looms were delivered several mechanics came from Aleppo to start assembling them. The three looms have a reed space of 125cm and are equipped with two shuttle boxes an one side for weft mixing. One of them is equipped with an old-type Staubli dobby, which has an harness capacity of 20 shafts. Selection is by means of a pattern chain with wooden lags where pegs are inserted when a lift is required. Although the Staubli dobby, which is operated by a continuous roll of card with holes punched for a lift, is much more versatile this loom requires a card-cutting machine, whilst the one delivered to the Centre does not.

The other two looms are fitted with Jacquards, one a Verdol and the other a Grosse, so that card-cutting machines will be required for both of them before designs can be woven.

<u>September 27 - October 26, 1977:</u>

<u>36) Revision of the Fabric Design and Development Programme:</u>

After making an assessment of the capabilities of the new trainees in the Design Studio, the programme of work was revised to meet the new situation. Again, a start was made with the analysis of

fabric samples.

The policy of copying both printed and woven designs was still being followed on the instructions of the Director of Weaving and Design, despite indications being given that fabrics being copied may not be entirely suitable for, and not necessarily related to, local market requirements. The necessity of a more comprehensive method of originating design ideas was discussed in order that the work in the Design Studio could be expanded to encompass a wider field of fashion. Feedback from salesmen is very essential if the designer is to understand the needs of the customer. Also, the designers should have the opportunity to accompany the salesmen occasionally on periodic visits to the market, to meet buyers and to consult with them regarding their current and future styling requirements. A system must be built up where there is a continuous interaction between the Design Studio and the intended market, with continuous feedback from the various marketing departments at the mills operated by the Textile Union.

Towards the end of September Mr. Farouk Said, one of the original designers who had left in May, rejoined the project. His return was very welcome as he is the most experienced of the counterparts now working in the area of weaving, designing and sample production.

37) Third-quarterly Report:

It had appeared certain that by the time the project had reached

this stage more specific information would have been available regarding the arrival of Government-supplied machinery and when that which had already arrived would be running. The Project Document details a definite time-table for the various phases in the build-up of the Centre and allows one year 1973-74 during which machinery and instruments supplied as part of the Government input should arrive. As it is recognised that the project is now two years behind schedule it is not unreasonable to suppose that at the time of the writing of the third quarterly report there would have been sufficient to revise the timetable and that information could have been made available to the Experts in order to facilitate the planning of their work programme during the last quarter of the assignment.

38) Arrival of Knitting Machinery and Assembly of Looms:
Reference was made at the tri-partite meeting to knitting machines being obtained from Syrian companies. Two such machines of the circular type used for the production of socks, were delivered to the knitting room early in October. Also, the team of mechanics from Aleppo were still working on the assembly of the Diedrich looms. This work was held up for several weeks as it was necessary to erect a gantry to support the Jacquard mechanisms above the looms. This consisted of circular pillars about 2.5 metres high with cross girders and anchor bolts had to be cemented into the floor to secure it.

In the meantime, Mr. Saied and Mr. Mukabah were put to cleaning the looms and painting them in order to make them more present-

able. As the Centre will eventually be a showplace for the textile industry as well as performing its functions in the areas of product development and the improvement of quality and production standards, special attention will have to be paid to housekeeping, and all work areas kept neat and tidy and machinery cleaned regularly. This point will be mentioned and enlarged upon in project findings and recommendations.

39) Training Courses in Physical Testing:

Training seminars were organised in the physical testing laboratory and technicians working in the quality control departments at the various mills were required to attend. The object of these courses were to explain how to operate the Uster yarn evenness tester.

It should be noted, however, that it is not sufficient merely to be able to operate the equipment correctly in the physical testing laboratory. The compiling and interpretation of test results is very important as well as the dissemination of these results to industry. A continuous follow-up will also be needed to ensure that test results on raw materials, yarns and fabrics are being used and not just filed away, if improvement is to be made in product quality. It is probably in the use of test results that most problems will be encountered, and the Director of Weaving and Design should work closely with the person in charge of physical testing in order to ensure that all new fabrics being manufactured are thoroughly tested at every stage of development. Then, problems which

may arise later, when the new designs go into full production, can be eliminated.

October 27 - November 26, 1977:

40) The Electronic Pattern Warping Machine:

As Mr. Shigashirow had left in August and he was the only person who had been trained in the operation of the Mergeth electronic pattern warping machine, it was now necessary to start training a replacement. As this machine is quite sophisticated and had been kept locked up most of the time since it arrived, this represented quite a problem. The Director of Weaving and Design had been present during the training session given by the engineer from Mergeth. However, as the instructions for its operation were given in English the language problem was again encountered.

The operating manual for the warping machine was in English so the Fabric Design Expert was asked to explain the operation of the machine in order that it could be translated into Arabic. Working with Mr. Saied, who will be responsible for warp dressing in the future, and Mrs. Tharan, who did the translations from English to Arabic, this work was successfully accomplished. As the Director of Weaving and Design claims to speak German fluently it was suggested that a further manual should be obtained in that language. Also, it was pointed out that there ought to be two people trained to operate the machine in order to avoid problems in the future.

41) Progress on the Fabric Design Manual:

The writing of the manual on Woven Fabric Design and Development is now progressing well on schedule. The first section was devoted entirely to a detailed description of Cloth Analysis with an example given of the analysis of a 15.5oz (490 grams) worsted suiting fabric, all calculations being done in both the English Worsted and metric systems.

This was followed by a section on systems of weave making. Then examples of 70 common weaves were given with notes regarding characteristics and use. The third section in the manual deals with the construction of Sateen Weaves and contains examples of all sateen weaves from 4 to 16 harness. After this the construction of Regular and Irregular Sateen Dirivatives is illustrated. Several pages concentrate on the methods used to design Crepe Weaves, Compound Twills, Weave Stripes and the Rearrangement of Twill Weaves. Drafting calculations are given, the reduction of a design by drafting explained, methods of checking drafts for errors noted, and the operation of the automatic drawing-in machine discussed.

An important feature of the design work is the production of colour and weave effects in fabrics, and the development of these styles is detailed and a standard design procedure for the development of new colour and weave effects laid down. The construction of various classes of designs such as Hopsacks and Barleycorns, Whipcords, Venetians, Honeycombs

and corkscrews has been included and this covers quite a large number of pages in the manual. In each section many examples of each type of design are depicted and technical details, characteristics and the method of construction fully explained.

Later in the manual a section has been devoted to the Planning and Preparation of Seasonal Fabric Ranges. Methods of originating design ideas are outlines and the necessity for a thorough market investigation, the evaluation of salesmen's reports and a continuous interaction between the Design Studio and Sales and Merchandising stressed. Administration in the sample and design area, work control, filing and records and range sheet details have been included so that these will be available when the looms are ready and practical sample production can commence.

42) Arrival of Double Jersey Machines:

Towards the end of November two more knitting machines arrived at the Centre. The larger of the two machines is a Stibbe PSDM 24" diameter 20 gauge interlock with 24 feeds. The smaller machine is a Mellor Bromley 4/ML4 20" diameter 20 gauge interlock with 12 feeds. Both these machines should prove to be useful additions to the equipment in the knitting room, despite their age, and they will enable some knit trials to be carried out in plain fabrics when they have been assembled.

November 27 - December 31, 1977:

43) The continuing Design and Fabric Development Programme:

As the work in preparing the looms for running was progressing, more woven designs were being prepared for the eventual start-up of sample production. These included sateen stripe shirtings on plain weave grounds, linen-type leisurewear fabrics in modified basket weaves, small crepe weaves and figured effects. One of these styles consisted of figuring by means of extra weft. The fabric in question having a black fancy motif on a white ground. The advantages and disadvantages of this type of design were explained and it was compared with a similar effect produced simply by printing a black motif on a plain white ground. It was pointed out that in the woven design the extra black weft showed through the white ground where it wasn't supposed to, making the white in that area appear dirty, or slightly grey. The print, therefore, apart from selling at a much lower price, had a pure white ground and had much more sales appeal. The Fabric Design Expert has tried to explain the characteristics of all designs dealt with throughout the year. Quite often the reproduction of a woven design in a print is completely overlooked, whereas price and other advantages indicate that this is the best way to produce it. As the subjects of woven fabric styling and print designing are distinct areas of technology, college training in one of the disciplines tends to be completely separate from the other. Experience of both can only be gained in industry, but at the Centre both the woven and print designers should try to learn about each other's work and this policy has been impressed upon the people concerned. If this idea is followed through it can only result in an improvement in the work being produced and a greater understanding and

spirit of co-operation. To further emphasise this point, when the production of Jacquard furnishing fabrics starts in the weave room, the print designs and the Jacquard designs must be chosen very carefully to co-ordinate and complement one another. If Jacquard designs are too similar to print designs they will face severe competition, purely from a price point of view. Careful planning of both sample lines will avoid this problem.

44) Visit of expert in Wool Scouring and Co-manager from Hama:

On December 4 Mr. Gordon Bellamy and his co-manager from the wool scouring project in Hama visited the Centre. They came to discuss the weaving and designing of woollen blankets. This is a project for future development and they were provided with details regarding the construction of various types of blankets, some using a cotton warp and a wool weft. Also, the use of ordinary and Brighton honeycomb weaves in these types of blankets was explained.

45) Weaving and Analysis of Lenos:

Information regarding the analysis and weaving of Gauze, Leno Fabrics, and Mock Lenos was requested. So a full explanation of these specialty type fabrics was given. It was demonstrated how in a Gauze fabric the Standard is always under the weft with the Duping end lifted first on the left-hand side and then on the right-hand side of the Standard end. However, in a Leno structure the Standard end is lifted over a pick between a lifting of the Doup on the left and the lifting of the Doup on the right. Also the harness arrangement with the

special loop and slip shafts was detailed in diagrams. Designs for Rock Leno structures using combinations of plain weave and a series of long warp and weft floats were graphed in order to show the difference between a True Leno and a Rock Leno.

46) Progress in Machine Assembly:

The erection of the looms has made very slow progress since they were delivered at the beginning of September. It took until mid-November before the supports for the overhead gantry for the Jacquard mechanisms had been erected and secured to the floor. Then the Jacquard units themselves, which are very heavy, were raised and secured over the looms.

The harness for the looms arrived at the beginning of December and work has just started on hooking this up to the Jacquard selection mechanism. The power supply has been connected and as soon as the harness has been fitted the loom should be ready to run. In early October the Design Expert requested instruction manuals for both the Verdol and Grosse Jacquard mechanisms. This was to find out the pattern capacity of the loom in order to provide some designing information and also to understand the card cutting and hook selection mechanism. These manuals are apparently unavailable but whilst the Jacquard mechanism was still on the weave-room floor an attempt was made to count the number of hooks. However, there were quite a number of hooks broken and missing so that this proved impossible. All the broken hooks will have to be replaced before the looms can run.

47) Provision of Transport:

On December 14, after a further three months of prolonged effort by the Project Manager a.i., a car was finally made available to the project by the U.N.D.P. Apparently, the concern expressed in a UNIDO memo from the Agro-Industries Section, Vienna, dated March 29, regarding the lack of adequate transport was not shared by the people responsible for providing same. Neither were the recommendations made by the Internal Audit Service in their report dated August 4 indicating that the waste of time being caused by the lack of a project car warranted renewed efforts to solve the situation taken seriously. It should not be thought by any means that the Experts were not grateful when a car was finally provided, as it certainly proved a great help in the final weeks of the assignment when the pressure of work was building up. However, the length of time taken to resolve the transport problem certainly had a tendency to detract from the final result. Telephone communication outside the Centre which has also caused innumerable and constantly recurring problems, interrupting the smooth-running and administration of the project activities, is still lacking.

48) Further Additions to the Knitting Room:

On December 20 three more circular knitting machines were delivered to the Centre. These consisted of a Mellor Bromley 4/MMS 18" diameter 12 Guage machine with 8 feeds and a small Jacquard patterning mechanism. The second machine was a Mellor Bromley 4/MM SMS/2 15" diameter 10 Guage machine with 8 feeds.

The third machine in the group was a 18 gauge 15" diameter Supreme Single Jersey machine with 50 feeds. The machines now available in the knitting room will enable an interesting and beneficial knit fabric development programme to be started once they are assembled and ready to run.

43) The Final Days of the Assignment:

This assessment of the work activities and implementation of project objectives has covered the period since the arrival of the Fabric Design Expert at the Centre on January 27, 1977, up the completion of the final report and the manual on Woven Fabric Design and Development on December 31, 1977. It is planned to review the activities in the Design Studio once more before leaving so that any final problems can be dealt with. This work will be carried out in the time remaining before the assignment ends and up to the date of departure of the Design Expert on January 17, 1978.

FINDINGS

F1) Expanding the Technology in Design and Fabric Development:
It has been found that, as with most inexperienced textile designers anywhere, the tendency is to concentrate more interest on the artistic side of the work to the detriment and neglect of the technological aspects. This will not, of course, benefit the objectives of the project with regard to an improvement in product quality and an increase in productivity. It has, however, been stressed very strongly throughout the designing programme that more attention must be paid to the technological side of styling and design.

Cost has always been a very important factor and today it is certainly one of the more essential limiting features of fabric development. Profits based on reduced costs and efficient production should not be looked upon by the designer as hampering work, but should be regarded as representing a tremendous challenge to overcome with ingenuity and expertise the constraints imposed by the budget.

F2) New sources of design ideas and fashion trends:
When it was noticed that the tendency was to copy samples from certain swatch books, which are subscribed to on a yearly basis, the Fabric Design Expert explained the limitations of this practice. It was clearly indicated that the local counterparts needed more exposure to a wider fashion panorama.

overseas visits to the leading international fabric and fashion shows do not appear to be regarded with as much importance as they should be. Competition locally is regarded as being negligible, and the problems which will be encountered in attempting to enter the world markets with the export of fashion fabrics are certainly not understood as they have not been experienced. Throughout the design programme, however, these points have been raised and discussed and an awareness of the matter is now apparent. A section of the Design Manual was devoted to this in order that it should not be overlooked (see Pages 69 through 76 The Planning and Preparation of Seasonal Fabric Ranges).

F3) A Systematic Approach to Research and Development:

In the sample and design area work has continued to expand with positive progress throughout the period of the assignment and rapid adjustments to both the training and work programmes have had the effect of overcoming most of the disruptions caused by bad planning outside the control of the Fabric Design Expert. Every effort has been made to guide the supervisory people concerned away from this haphazard method of working. It has certainly been established, however, that expert guidance will be needed for at least two to three years if progress is to continue in this direction and it will be irresponsible to ignore this fact. It is only necessary to examine the administrative record so far to see how far removed this is from the disciplined and systematically planned approach which will be required when carrying out the research

and development work, and the testing and quality control procedures necessary to achieve the main objectives described in the project document.

F4) Merchandise Meetings - Overall Involvement In the Planning of Ranges:

Generally, as work in the Design Studio progressed it was found that the majority of the designers are not involved in any way in the overall planning of projected styles and pattern ranges. The system being followed is to instruct each designer which designs to do and give each person a share of the work-load. This method of working inhibits the development of personal initiative, and is a big handicap tending to obstruct the flow of new ideas.

F5) Hand-Loom Weaving in the Design Studio:

Some resistance has been encountered to the idea of using hand-looms for experimental work, although this is quite a common method adopted in design studios in many countries. Whether the work is looked upon as being old-fashioned and out-dated due to quite a large number of very ancient hand-looms being in use locally in craft shops, is not quite clear. However, the position has been fully discussed with those concerned in equipping the Design Studio and the advantages and disadvantages pointedout. To students the hand loom is invaluable in enabling them to fully understand the weaving process. To the experienced designer new fabric ideas can be quickly tried out and evaluated without going to the expense of making long warps and interrupting sample production. If

a new idea turns out to be no good, and every new design is not an instant success, then the amount of waste created is very small compared with that which results when carrying out the experiment on a power loom.

F6) Pilot Weaving Plant - Compatibility with Production Units:
The first three looms available at the Centre are very old and in no way compatible with, for example, some of the latest weaving machinery now being installed in local mills. They will, of course, provide an excellent facility for the practical training in weaving and sample production. The design capability of the dobby loom with no capacity for patterning in the weft is very restricted. A further factor to be considered is the fact that a newd esign may weave perfectly on one of these slower, old type, looms. When, however, it goes into one of the new high-speed weaving machines where shedding, picking, and beatup is taking place at twice therate of that at which the original sample was woven, all kinds of problems could and will arise.

F7) Lack of Definitive Information on the Delivery of Pilot Production Machinery:
As the project progressed it was apparent that there was some reluctance to devulge any information regarding thed elivery of the major part of the pilotproduction machinery. Whether this was due to embarrassment on the part of the people concerned, is not quite clear. It did, however, make it very difficult as far as the work programme in the Design Studio was concerned, to plan ahead with any certainty. This situation

continued throughout the year despite intensive efforts to have the position clarified, and even though it was explained very clearly that the information was only required so that adjustments could be made where necessary in the training programme for the benefit of the project as a whole.

F8) Machinery Maintenance - Occupational Safety:

During visits to mills it was noticed that attention to such things as the cleaning of machinery and maintenance had a tendency to be overlooked. This factor can contribute a lot to bad quality, as well as a fall-off in production. Passageways between machinery were quite often blocked, spare parts left lying around, and oil and waste on the floor. This results in a very hazardous situation and can cause frequent accidents.

Another factor, which is important to mention, is thatmost operatives wore open-toed sandals. This is a very dangerous practice when heavy warp beams have to be moved, shuttles with steel points are frequently dropped and heavy hand-trucks with metal-shod wheels are being pushed around. It is quite understandable that the type of footwear worn by the operatives is dictated by economic reasons, but the situation exists nevertheless. Working in a hazardous and accident-prone atmosphere can contribute greatly to work attitudes and this of course can also have a detrimental effect on both output and quality standards.

F9) Industrial Engineering:

In discussions regarding the testing and evaluation of new designs and fabrics it was found that no provisions had been made in the Project Document for the recruitment of any qualified industrial engineering personnel. Laboratory-scale evaluation of raw materials and the testing of yarns and fabrics will provide all the necessary technical data to establish realistic standards for both quality and performance. Pilot production runs, however, will require accurate assessment by qualified work-study people if the Centre is to provide the local textile industry with the first-class service evisaged, Also, the future test running and evaluation of all types of new machinery, which should be carried out at the Centre, would require the proper and accurate measurement of performance and output statistics.

F10) Fashion Design, Garment Production, and Making-Up:

Referring once again to the Project Document, it appears that this area of technical know-how has also been overlooked. To fully evaluate all fabrics before they are released to the market, model garments should be made. To name but a few of the problems which may be encountered:-

a) Seam Slippage - can be checked out in physical testing but it is obviously less critical in loose-fitting styles than when fashion indicates a trend towards a closer fit.

b) Difficult in Matching Patterns During Making-up:- this problem can quite often be resolved after discussions between the fashion designer and the fabric designer.

c) A new Design in a Fabric may cause making-up Problems - again a slight modification to the design may eliminate the problem completely without radically changing the look, and this can be tried out in a model garment.

d) Co-ordination of Fabric Design and Fashion Style. While in the textile industry generally the fashion designer looks for suitable fabrics to create a new trend, the Centre has the ideal situation for bringing both the ideas of the fabric designer and the garment stylist together. In the planning of the new season's range, this is illustrated dramatically and to great effect in the final presentation. This really means that the fabrics are designed with the eventual style of garment in view, whilst the garment design studio is working on new fashion ideas styled in such a way as to present the new fabrics to their greatest advantage.

e) The fashion designer would also be concerned with providing information on such items as the correct linings and inter-linings to be used in the manufacture of the garments, and the correct trim, fasteners, etc. Perhaps the most important function would be planning in conjunction with the fabric designers the seasonal presentation of new designs in the form of a fashion show. This requires a tremendous amount of organisation as all the new fashion styles have to be designed and made up after the new fabrics have been woven, finished and tested for performance.

F11) Achievement of Results:

In a discussion with the Production Manager at one of the Mills, which had just completed a large expansion programme, the question

was put to why they had been able to get their machinery delivered and in production within a very short time of the projected target date. Meanwhile, at the Centre, 10 years was being quoted by the Director General as the time required before it would be in a position to effect a worthwhile impact on the textile industry. The reply was that the mill concerned was a production unit. Apparently, the fact that the Textile Laboratories and Design Centre is also a very important production unit is being overlooked. When this point was mentioned to local counterparts they could not understand why the Centre should be described as a production unit, until it was explained to them that what it must produce is RESULTS, and these as quickly as posible, not ten years from now. This point is included in the findings as an indication of what could be behind the constant delays and disruptions experienced so far.

F12) Plant Modernisation:

It has been found that plant modernisation at some of the mills visited is going ahead far more rapidly than the build-up at the Centre. If a change cannot be effected in the attitude of the administration, and the sense of urgency injected into future planning and experimental work, the prospects of achieving the Project objectives in the long-term are going to receive further setbacks. In order to achieve the twin targets of an improvement in product quality and an increase in productivity in the industry overall, the Centre must assume leadership and set an example in modern, efficient planning.

To create an awareness of the problems existing and the methods needed to overcome them, the Centre must first of all set its own house in order, and there is every indication that this is going to take a very long time if present trends are anything to go by.

F13) Personnel Changes and Adjustments to the Training Programme:

The various changes which occured in the Design Studio personnel during the year were never notified in advance to the Fabric Design Expert. Whether this was because they occurred too suddenly for any notice to be given, was not apparent. Quite often someone would arrive at the Centre and it would not be known whether they were just visiting or there on a permanent basis. This could of course be directly related to the language problem, because at least twice during the course of the project notification of a local holiday was given in Arabic only. As a result the Experts were left waiting for transport early in the morning and wondering what had happened. However, recruitment of staff must have been known about in advance and it would have greatly helped the smooth running of the Design Programme if information regarding new additions to the Design Studio personnel had been made available beforehand.

F14) Development of Library Facilities:

During a visit to the Industrial Research and Development Centre in Nezze, one could not help but admire the excellent

library, which has been built up. The young lady who will eventually be responsible for the efficient administration of the library at the Textile Laboratories and Design Centre has spent several weeks on a training course at the library in Prezze. Delays have been encountered once again, this time in obtaining reference books and technical magazines dealing with design, fabric development, and fashion trends. A list of these was submitted to the Director General in March. It was planned as part of the training programme to explain the process of separating the valuable technical articles from the general newsitems and advertising materials. Then these can be filed and indexed for future reference. The Fabric Design Manual has been compiled in order to fill this gap. However, it is to be hoped that the reading material which was requested is available in the near future, as it is an excellent way of keeping up-to-date with the latest developments in the textile industry all over the world. It is recognised the language difficulty would enter into this, but most important articles appearing are usually translated into various languages as they appear in different countries. Several of the local counterparts speak German and there is certainly no shortage of technical and fashion literature from that source.

F15) Visit of Auditor from U.N. Internal Audit Service:

It was found that the auditor who visited the project at the beginning of May for the purpose of carrying out an audit and inspection, demonstrated a tremendous amount of interest and enthusiasm in finding out the reasons behind the delay, and

showed his appreciation and understanding of the problems being encountered. The items highlighted in his report had already been mentioned previously by the Experts as warranting management-level attention. Also, his recommendations were a welcome indication that the effortsbeing made by the Experts to inject a sense of urgency into the Project and get the work programme moving more rapidly towards achieving Project objectives were well founded.

F16) Discussions at the Tri-partite Review:

During discussions taking place at the Tri-partite Review a definite tendency was encountered to overlook the basic problems which have been the main obstructions to progress, and this is clearly indicated in the report of the meeting. It is recognised that theseproceedings must be conducted with the utmost diplomacy but when serious problems are encountered in any project they must be brought out into the open, discussed objectively by all parties concerned, and action decided upon to overcome them. There was a notable lack of criticism on all sides and it is felt that if more constructive criticism had been forthcoming this could have done nothing but benefit the future of the project.

F17) Non-technical Project-related Problems:

Although the subject of lack of transport and telephone communication has been stressed innumerable times, it has to be mentioned once again in the findings. It must be obvious that with proper application and initiative both

problems could have solved at the very beginning of the Project. However, the concern expressed by the Experts about the waste of valuable Project time caused by this situation apparently were not taken sufficiently seriously as to warrant immediate action. It should be stressed, however, that at no time throughout the Project was the problem allowed to get out-of-hand. At all times the work programme has been kept moving forward, even though it has often been necessary to work at home to cope with the many disruptions.

F18) Assistance in Finding Suitable Accommodation:
Although not directly connected with any technical aspect of the Project, it was decided to mention the following in order that it may assist any future Expert who may be assigned to the Project. On page 21, item 13, of the Project Document, it is stated that, "The Government shall assist all project personnel in finding suitable housing accommodation at reasonable rents." It should be noted that no assistance whatsoever was given to the Fabric Design Expert by the people concerned in this matter.

RECOMMENDATIONS

R1) Concentration on the Improvement in Design Technology:
It is recommended that efforts continue to be concentrated on improving the designers' appreciation of the necessity for considering every new style from the point of view of quality, ease of production, and cost reduction. (See page 45 F1). If this policy is followed it will make very important contributions towards fulfilling the main project objectives in improving quality and increasing production.

R2) More Exposure to the International Fashion Scene:
There must be a gradual movement away from, and a change in, the policy of copying designs. This will not only create a more productive atmosphere from which better styles will emerge, but will also give the design studio personnel a much wider sense of achievement. It is also suggested that as soon as possible arrangements be made for visits to international fabric exhibitions in different parts of the world. It must be emphasised, however, that a fully comprehensive report of these exhibitions has to be presented by the person sent. This is to ensure that all the information gathered is circulated and then the fullest use can be made of it. (See Page 45/46, F2).

R3) Research Planning and Application of Results:
It is very necessary with the Research and Development work projected as the future functional activities of the Centre that there will be available a specialist in Textile Research

and Development with the necessary authority to guide the establishment through the initial stages. This is a very important and involved technical field and if the necessary disciplines are not followed exactly in the interpretation of results, both by the Centre and the industry as a whole, the end results will fall far short of the original objectives. (See Page 46, F3).

R4) The Design Team:

Recommended changes in the method of working in the Design Studio (See Page 47, F4) are aimed at total involvement. It will be found beneficial to stress team-work and a little competitive spirit, which will bring out the best in each designer. The result will be an improvement all round in the styling and development of new ideas.

R5) Sample Production on Hand Looms:

It is definitely recommended that four small hand looms be obtained for the Design Studio as quickly as possible. These can be of the table-top variety but should have at least a 16 to 20 harness capacity. There is one type available where each harness is lifted individually by a lever mechanism and this is very versatile in the production of a wide range of fancy weaves. (See Page 47, F5).

R6) Urgent requirements in the Weave Room:

It is essential that a high-speed weaving machine with a capacity of up to 20 harnesses be obtained as soon as possible.

This is to ensure that the weaving of new samples can take place under similar conditions to those existing when the new designs go into large-scale production. (See Page 48,P6).

K7) Exchange of Information:

It cannot be emphasised too strongly that the lack of communication regarding progress in the ordering and expected delivery of Government-contributed machinery and equipment has been one of themajor factors causing repeated and continuous changes in the training programmes. It is not suggested that confidential information should be made freely available. It is advised that a free exchange of information vital to the smooth running of the Project build up an atmosphere of mutual confidence and collaboration, and this should be noted by all concerned. The Project Document highlights this as one of the main difficulties existing as early as the beginning of 1974 so that it would appear that strenuous efforts are indicated, to break down this barrier. (See Page 48-49, P7).

K8) Housekeeping, Up-keep of Machinery and Safety Standards:

It may not appear at first that this subject has any connection with fabric designing, but the whole question of raising quality and production standards, whether by style and design improvement or other methods, is all inter-related. Attention must be paid to the cleaning and regular maintenance of all production machinery, and the Centre must set an example to the industry. Work areas should be kept tidy and safety

precautions discussed. It is suggested that an accident committee be formed to inspect regularly, especially the particularly hazardous areas, and make recommendations for an all-round improvement. The use of protective clothing, especially footwear, should be encouraged. If these recommendations are followed (See Page 49, F8) it is certain that big improvements will be noticed in work attitudes, and this will reflect in an upgrading in both quality and production.

R9) Work Study:

Although this subject appears to have been overlooked in the Project Document, it will be found necessary to provide personnel to carry out this work (See Page 50, F9). A start can be made in a very small way and probably one suitably qualified person would be sufficient until the Centre shows further expansion in itsactivities.

R10) Model Garment Styling and Making-up:

The establishment of a second design studio with the responsibilities for the design and make-up of model garments, both in men's and ladies wear, is recommended once the production of sample lengths is well under way. The person entrusted with the direction and administration of this work should be competent and have a good background in both the tailoring of woven and knitted fabrics. (See Page 50, R10).

R11) Production Targets at the Design Centre:

It is recommended that the Centre sets itself a target similar to the "Zero Defects" campaign which has been highlighted in many of the leading textile mills throughout the world over the last ten to fifteen years. The present attitude must be substituted by a sense of urgency and a realisation that all the people employed at the Centre are working in a very important production unit which is vital to the improvement of quality and production throughout the rest of the textile industry. The product at the Centre - [illegible] - must be recognised and given its proper priority as the leading factor in the modernisation of the national textile industry, which is now underway. (See Page 51/52, F11). The installation of pilot production machinery at the Centre is proceeding at a much slower rate than at other millswhere new equipment is being installed, (See Page 52, F12), and as the Project objectives indicate, the Centre must complete the requisition and installation of all equipment very, very quickly in order to assume its rightful role of leader in the industry.

R12) Specialised Training and Problems Caused by Changes in Personnel:

As the Textile Laboratories and Design Centre is situated a long way from the main centres which produce textile manufacturing machinery, it is recommended that at least two operatives be trained on any equipment where specialised knowledge is required. This will eliminate the necessity of having instructors return to the Centre from the companies

supplying the particular machinery and will result, not only in savings costwise but will ensure that there are no delays in the sample and design programme. (See Page 53, F13).

R13) Reference Books and Magazines:

The reference books and magazines listed in a memo given to the Director General of the Centre in March should be obtained as soon as possible. (See Page 53/54, F14). As the departure of both Experts is imminent, these will be found to be a valuable addition to the library at the Centre and can be referred to frequently when problems arise.

R14) The Provision of Future Assistance with Respect to Expertise:

In concluding the recommendations it is not possible to agree with the statement that "no further assistance with respect to expertise is required." If the full potential of the Textile Research and Design Centre is to be realised, and the full advantage of the financial investment obtained quickly, expert guidance must be provided for at least two more years. This can only result in continued benefits to both the Project and the administrative personnel involved, and it will ensure a more rapid advancement in reaching the final objectives.

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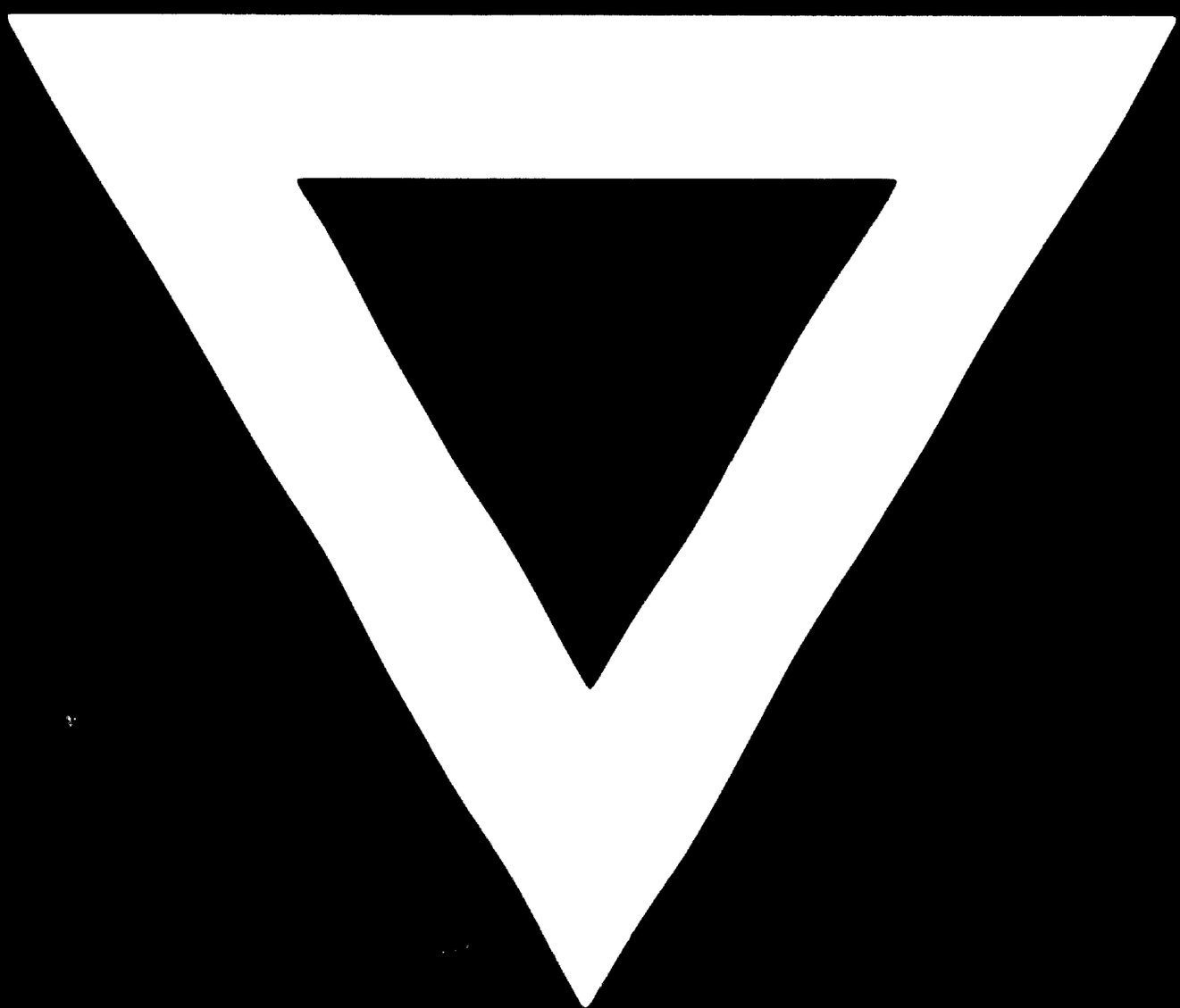

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