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LEATHER RESEARCH AND TRAINING INSTITUTE

DU/TUR/74/007

TURKEY

Technical report: Footwear manufacturing

Prepared for the Government of Turkey by the
United Nations Industrial Development Organization,
as an agency associated with the executing agency,
the Food and Agriculture Organization of the United Nations

Based on the work of R. Lucas, expert in
footwear manufacturing

United Nations Industrial Development Organization
Vienna

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Explanatory notes

References to dollars (\$) are to United States dollars. \$1 = 100 ¢.

The monetary unit of Turkey is the lira. During the period covered by the report, the value of the Turkish lira in relation to the United States dollar was \$US 1 = LT 16.50.

A comma (,) is used to distinguish thousands and millions.

References to pence are to 1/100 pounds sterling (£). In mid 1976, the value of £1 was \$0.628.

PVC is polyvinyl chloride.

LRTI is the Leather Research and Training Institute.

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ABSTRACT

In 1974 the United Nations Development Programme (UNDP) set up the project "Leather Research and Training Institute, Phase II" (DU/TUR/74/007) to assist in promoting the further development of Turkey's leather and allied industries, which are of great and increasing importance in the Turkish economy. The executing agency for the project is the Food and Agriculture Organization of the United Nations (FAO), with the United Nations Industrial Development Organization (UNIDO) as an associated agency.

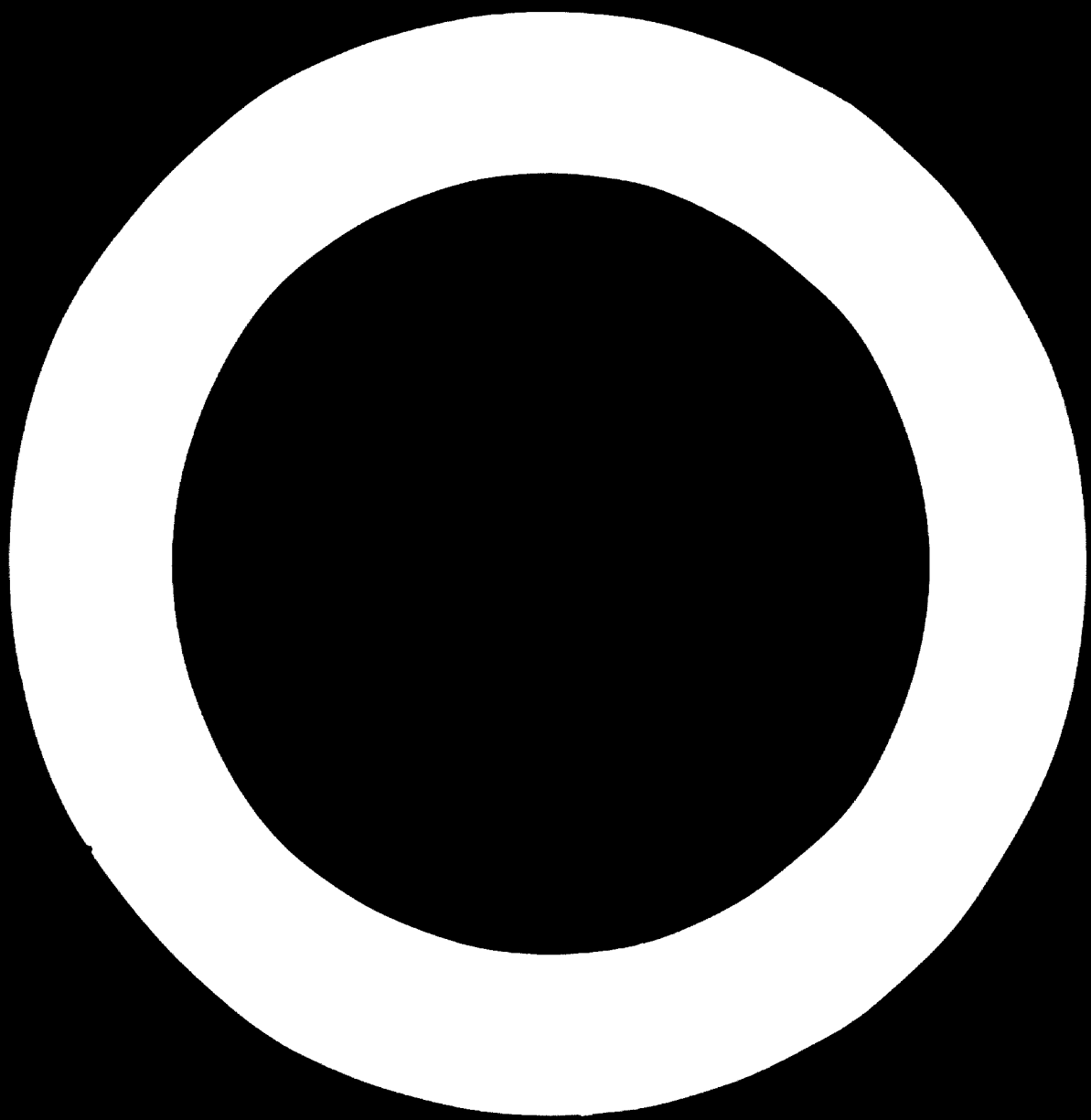
In January 1976, UNIDO assigned an expert in footwear manufacturing to the institute (LRTI) for twelve months, under the general supervision of the FAO Project Manager, to work in the footwear section of LRTI and organize, assist and participate in training courses in the manufacture of footwear. He was also to assess the state of the Turkish footwear industry and of the footwear department of LRTI and make suggestions for their development and expansion.

Upon his arrival, the expert found that the buildings and machinery were basically suitable. However, since electrical power had not yet been installed, he began with short courses in pattern cutting and design and carried out extension services. In March 1977, further machinery was supplied by UNIDO. The expert first installed equipment suited to practical training courses and made the training section fully operational.

Several problems were encountered. Perhaps the most important was that no local expert was made available until the last three months of the assignment, and even then only on a temporary basis. Another major problem was the difficulty in obtaining supplies of the machinery, materials, components and spare parts required for footwear manufacture. Neither LRTI nor the Turkish Government seemed willing to take action to correct this situation. However, a full-time six-month course for shoe technicians was conducted, and shorter courses on design and pattern cutting were also given.

The expert conducted a general study of the Turkish footwear industry, giving production costs and similar data, suggesting that small-scale shoemaking units develop by using small, essential pieces of machinery to substitute for or supplement certain hand methods, thereby increasing production without creating labour redundancy. While the craftsmanship of the Turkish shoemaker was considered to be exceptionally high, modernization of the industry was necessary, and LRTI could assist in this respect, if provided with effective leadership and if enabled to acquire, from abroad if necessary, the machinery, spare parts, materials and components needed.

A general survey of the present state of the Turkish shoemaking industry is appended as annex II.



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INTRODUCTION

The leather goods industry and those related to it are very important to the Turkish economy, particularly in the export trade, where there has been a significant increase in recent years. The United Nations Development Programme (UNDP) has set up the project "Leather Research and Training Institute" (DU/TUR/74/007) to assist in promoting the further development of this industrial sector. The executing agency for the project is the Food and Agriculture Organization of the United Nations (FAO), with the United Nations Industrial Development Organization (UNIDO) as an associated agency. The Leather Research and Training Institute (LRTI) is located at Pendik, near Istanbul.

In January 1976, UNIDO assigned an expert in footwear manufacturing to LRTI for twelve months. Under the general supervision of the FAO Project Manager, he was to work in the footwear section and organize, assist in and conduct training courses in the production of footwear. He was also to assess the state of the Turkish footwear industry and of the footwear section of LRTI and make suggestions for their development and expansion. The work programme of the expert is attached to this report as annex I and his report on the shoemaking industry as annex II.

The Turkish footwear industry is made up of about 15,000 producing units, most of which are small workshops (ateliers) with outputs of only 1 to 1.5 pairs/worker/day. (The norm is 5 pairs/worker/day). These small workshops are, in general, poorly organized and utilize old plant and substandard techniques. Several co-operative schemes have been initiated under the project and are at various stages of implementation. There are also some large footwear factories, 3 in the public sector and 11 in the private sector. The industry produces about 30 to 35 million pairs/year of leather footwear, a major proportion of which have rubber or synthetic soles. It employs about 80,000 workers. Its special problems are poor organization, lack of standard lasts, inferior pattern-cutting techniques and difficulties with the supply and quality of materials and components.

The expert arrived at LRTI on 16 January 1976 after briefing in Vienna and was debriefed in Vienna on 29 and 30 November. From 2 to 10 December he was involved with visits to machine and shoe factories in the United Kingdom by groups from the Turkish shoe industry.

FINDINGS

Plant

The Leather Research and Training Institute at Pendik-Istanbul has been planned with great foresight to meet the future needs of every aspect of leather technology and utilization in Turkey. Its buildings and facilities may be compared with those found at any such institution anywhere. LTRI can easily be seen as a centre of great significance in a part of the world where leather and its products are rapidly increasing in importance.

The practical footwear workshop of LTRI has an area of 310 m² and is ideally set up for training and demonstration. Its size and shape approximate those of a small shoe factory with an output of about 250 to 300 pairs/day; it is thus a means of visual presentation to entrepreneurs who wish to set up small shoe factories. As yet there are few such factories in Turkey, but many are needed, so the problems concerning their layout and the location of their machinery and equipment are important. LTRI has devoted much attention to this area.

Machinery

The machines in the footwear workshop were acquired in three stages. Many were purchased from a shoemaking school in the Netherlands at the outset of the project, and in 1971 four new machines were ordered from Italy, and in March of 1976 the balance of the machinery ordered arrived from the United Kingdom. Annex III to the present report includes a complete list of the machines on hand, recommendations for the acquisition of spare parts and recommendations for further purchases. All of these machines were in relatively good condition, but none of them, including the new upper press, grading machine and insole moulding machine that had been imported from Italy in 1971, had ever been operated; no attempt to put them to use had been made.

Materials and supplies

All of the difficulties of LTRI are but reflections of the problems of the industry. If they are not solved systematically, making the best use of the means and resources available to LTRI as a government institution, progress will be slow or even, in some areas, impossible. A case in point is the matter of obtaining spare parts. This problem is complicated by the fact that the machinery came from many different sources and arrived at widely separated times. This problem is further complicated by restrictions on imports and complicated customs formalities. An example is that of the Lince grading machine, for which a supply of punches was needed. It was impossible to obtain them through normal channels, so a UNIDO consultant, after the completion of his assignment, personally went to the factory that made them, purchased what was needed, paid for them, and sent them to LTRI directly. Previous attempts, by letter and telegram, had been fruitless.

Added to the problems of communication are those of customs clearance. A good illustration is the case of the Singer 196/301 sewing machine (the only one of its kind in Turkey). The procedures for ordering spare parts are so formidable and time consuming for the supplier that LTRI had not received the part after nine months of placing the order for them. This situation is entirely due to restrictions on imports other than those acceptable to government departments.

To complicate matters, there was no one who understood the problem of supplies within the shoe industry, and, even more disturbingly, in LTRI itself, there is a complacent attitude towards this problem; the tendency is to accept the limitations imposed rather than to try to overcome them.

In some cases, after the materials have been located and acquired, they must be processed in some way. For example, for its effective use in new equipment, the brass used in pattern binding must be cut into 5-mm widths and rolled into coils. At this time, neither LTRI nor the Marmara Scientific and Industrial Research Institute knows of the existence, in Turkey, of equipment to perform these tasks. However, the Institute has suggested a method whereby it could be done within LTRI.

As with spare parts for machinery, there is great difficulty in obtaining the right materials and components. There are three basic reasons for this situation:

1. Government restrictions on the importation of materials;
2. Economic factors that derive from the present structure of the shoemaking industry in Turkey, which consists primarily of a multitude of very small independent shops. Anything that would require a sizeable capital investment would be quite beyond the capacity of the industry, and the introduction of a new process or material on a significant scale would be impossible, owing to the highly fractionated nature of the industry;
3. Lack of development work in the principal government shoe factory (Beykoz-Summerbank). Such work could influence the entire industry.

In this area alone, a competent person at LTRI could devote an entire year to trying to solve these manifold problems.

With LTRI, as with the industry in general, the acquisition of materials is difficult and complicated. In most cases, individual shoemakers actually find and collect the leather and other supplies that they need; journeys from Izmir to Istanbul to pick up leather are a regular feature of the industry. During the first few months of the project, this situation led to serious delays, since only one person at LTRI, the United Nations Administrative Officer, had any knowledge of the industry. Without his willing help and useful advice, progress would have been even slower.

The problem of finding the best suppliers was a difficult one; it was solved only recently. LTRI has gradually built up a file of suppliers, but this work must be up-dated continuously. All too often, after having found the right material, it could not be re-ordered from the same source. This situation arose in connection with the making of patterns. Satisfactory board and brass were found to make the first samples. The brass was obtained from Beykoz-Summerbank, but they had obtained it so long ago that its source was no longer extant. More detailed discussions on supplies of materials and components should be held with the managements of the Derby and Beykoz-Summerbank factories.

Design

The importance of good design is recognized throughout the industry; efforts to achieve high standards are quite apparent in the small-scale

enterprises. LRTI has attempted to teach the principles of design rather than try to develop a complicated system of measurements based on European concepts. Much practical assistance in this area has been received by a staff member who received her training in Bulgaria and who has many Bulgarian textbooks of the subject.

LRTI is not strong in the field of pure design, and in its present stage of development it would be premature to engage a full-time designer. However, the influence of good design is important, and the aesthetic aspect is something about which LRTI should be concerned. Certainly, it must plan for the future in terms of design training. For this reason, contact has been sought with the centres of fashion and dress design in Istanbul so that mutually beneficial relations could be established. A very encouraging response has been received from the Institute of Applied Arts (Olguflasma Enstitüsü), which has two design departments: one for Turkish art, the other for fashion. They are equally important, since in the Turkish Art Department there is a detailed study of Turkish historical art, up-dating some of it for modern industrial purposes, and this has been done very successfully. Some of these designs could be quite easily incorporated into sandals, slippers and other footwear.

Its students are trained over a two-year period and afterwards, in what appears to be a very effective and significant programme, after the initial training period, the institute not only guides and teaches the students but finds employment for them in industry. Articles produced by the students are sold to the public by means of displays in the windows of the Institute on a principal thoroughfare in Istanbul. The profits, over and above the cost of the materials, are divided equally between the students and the Institute.

This concept of participation of students in industry could well be applied to the Footwear Department and the Leather Goods Department as a whole. The idea of having students who have attained a good level of skill produce designs and patterns for industry would broaden their experience and keep LRTI in close contact with the industry it serves.

Steps toward such collaboration between LRTI and Institute of Applied Arts have already been taken. The Institute has sent a delegation of its staff to LRTI to find out what facilities are available and to determine what assistance they might be able to render. As a result, it has been agreed that their lecturers on design can assist LRTI on a part-time basis and that their own students could well attend some of the courses at LRTI.

Staffing problems

From the outset of this project there has been the concept, which was never worked out properly, of a Revolving Fund that would help to support the activities of LRTI. In the project document (TUR/74/007/A/01/12, draft date 22 November 1974), the following may be found on page 9:

"...Extensive use of the Institute's services for which charges will be made and the development of semi-commercial operations should in time give the Institute a degree of self-sufficiency. Income from all sources could be augmented, if necessary, either by voluntary contributions from industrialists, or by the levy of taxes by the Government on their output. Such fees and charges as the Institute may make and income from other sources will thus be available for meeting the running expenses of the Institute. To the extent that the Revolving Fund is increased, the Institute's dependence upon Government support will be lessened.

"The successful establishment of a Revolving Fund, as well as a semi-autonomous status for the Institute, will enhance the recruitment of qualified counterpart staff with industrial experience under comparatively more favourable terms of employment."

Unfortunately, this potentially useful concept has become vitiated. The development of the Revolving Fund and the emphasis on so-called self sufficiency have already led to labour and staffing problems, and serious consideration must be given to the situation.

The present emphasis throughout LRTI is on high-quality articles that can be produced almost at leisure. Because of this, some staff members are rewarded with special financial supplements based solely on their work on "special" orders for bespoke articles, while others who are making real contributions towards industry and training are not so rewarded. This is particularly true in the Footwear Department, where staff who have worked hard and effectively with students find that other members who have been doing this special work have been treated more favourably. It is thus evident that, in the general policy based on the revolving financial fund, the entire emphasis on service to industry and the students is becoming lost. This situation presents a great danger to the future of LRTI. There is also the danger that staff involved in making such special articles will become an élite among the LRTI staff, while among the general workforce, staff such as those in the tannery who produce no salable end-product will have no opportunity to advance themselves.

Another general policy, as regards teaching staff, is the payment of hourly teaching bonuses for a maximum of eight hours weekly. Since the actual class contact time is only 40 minutes per hour, the overall incentive to teach is very low indeed, so the staff is not being used to its maximum effectiveness. There are also some anomalies as regards the bonuses for teaching certain subjects.

It is certain that there is a pressing need to investigate general staffing and incentive policies. A satisfactory solution to this problem would have far-reaching effects on the general well-being and progress of LRTI. If it is to succeed in its mission to serve the industry and its own students, LRTI must provide enlightened leadership to its staff, based on service to the students and to industry.

A fundamental difficulty within the Shoemaking Department of LRTI is that in the entire industry in Turkey there is but a small handful of people who have the needed background and technical ability and who also speak English. These people have come forward voluntarily to assist in the development of the Shoemaking Department of LRTI, but their time has been limited by their own business commitments. Special tribute should be made to one such person who had set up his own successful small shoe factory but who devoted much time to assisting in setting up the first full-time course.

Future staffing requirements

Having brought LRTI to its present level through the investment of much time, money and hard work, its Director, the Project Manager and the Management Board are actively seeking ways in which this momentum can be sustained. It must be realized that, in shoemaking, there are so many areas of specialization that it would be quite unrealistic to expect any individual to be able to teach them all. The Footwear Department is already in the situation where it

simply hasn't the staff to teach all of the required courses. (That such a situation is not exceptional is demonstrated by the fact that, on the tanning side of LRTI, there are a number of staff members who have been specially trained in the production of shoe upper leather, garment leather and fur skins.) In every field of shoemaking there is a great need for help and research. Consequently, LRTI should have on its staff people able to conduct six-month courses in the following areas:

- Pattern cutting and design
- Upper cutting and casting
- Upper making
- Lasting
- Making
- Finishing and pre-finishing
- Shoe room

These areas of coverage must be regarded as the minimum needed if LRTI is to make any significant contribution. Furthermore, it must be realized that firm support will be needed if LRTI is to acquire the materials and equipment needed to conduct these courses. Thus far, a little of everything has been done; henceforward all of it must be consolidated and developed.

Fellowships

The recommendations of the previous expert in shoemaking, that more fellowships should be provided and that the number granted in shoemaking should approach more closely the number given in tanning. It must be faced, however, that the fellowships programme has the serious defect that fellowships can be awarded only to persons employed by government establishments.

Senior personnel

It cannot be overstressed that the principal handicap to the development of the Footwear Department has been the failure to provide a capable, fully qualified local counterpart to the expert to work with him full time during his assignment and carry on his work afterwards. This must be said, although invaluable assistance was rendered by several people for various periods.

Summary

While LRTI has made notable progress during the twelve months of the assignment of the expert, it was in the last three months that the Footwear Department really became alive. The influence of LRTI is being felt distinctly throughout the shoe manufacturing industry. This has been and continues to be a source of satisfaction and encouragement to all concerned. Thanks should be extended to the management of the Beykoz-Summerbank footwear factory for permitting one of its most capable senior staff members to make his important contribution as temporary local counterpart to the expert. The most important findings may be summarized as follows:

1. The facilities and equipment of LRTI are excellent.
2. The present staff of the Footwear Department have made a valuable contribution to the industry and are able to teach. It is doubtful that they could be surpassed in Turkey.

3. The weakness of the Footwear Department is inadequate linkage with the management of LRTI. It is imperative that someone with the needed technical abilities and leadership qualities be appointed to direct the work of the Footwear Department and keep in close and effective contact with the management of LRTI.

4. The aims and objectives of LRTI should be made quite clear to the staff. There should be no making-up of special orders except within the context of development or research.

5. The Footwear Department requires certain machinery and equipment. The heat setter should be developed, and good sewing machines and upper-making equipment should be purchased. They should have priority over sole-stitching machines. It is possible that a second-hand Littleway lockstitch could be acquired from the Beykoz-Summerbank plant. Also needed are a new stuck-on press and an adhesive activation heater.

6. At this time, no responsibility has been assumed at any level for the importation or development of materials or equipment that are required. There is a total lack of determination to obtain such things. Had the expert not brought so much equipment with him, the success of his mission would have been quite limited. Consequently, when the new machinery has been acquired, it is uncertain whether sufficient efforts will be made to re-order the hot-melt cements, spare parts and the like that will be needed to keep the plant operational. Unfortunately, present efforts are directed towards the production and sale of prestige articles that have no effect whatever on the development of the shoe manufacturing industry.

7. It must be recognized that for expert services or plan to be effective, there must be the necessary supporting resources if new methods or concepts are to be introduced. In shoemaking, as in any other area, it is of little value to teach methods that cannot be introduced or used because of restrictions or controls.

II. ACTIVITIES OF THE EXPERT

The work programme of the expert during his assignment is presented as annex I to the present report. To enable him to begin his work immediately on his arrival, he brought with him, as requested by the Project Manager, a sizeable amount of equipment, including:

- 2 sets of press knives for shoe uppers
- 40 pairs of lasts
- 1 set of brass-bound patterns
- 1 post sewing machine

This equipment is now the property of LRTI and has been put to use. This incident illustrates the tremendous difficulties that are encountered in importing vitally needed machinery and supplies. Had this material been requisitioned through the normal procedures, it would not have arrived for three or four months, during which time the ability of the expert to perform his mission would have been seriously hampered. The Footwear Department of LRTI was made operational without this loss of valuable time.

In addition, lasting and patternmaking machinery were ordered, within the limits of the funds available. It arrived in March 1976 and became operational almost immediately. The decision taken in 1975 to bring in patternmaking equipment to complement the Lince grading machine and the lasting machinery proved to have been an excellent one, permitting the fulfilment of needs of the shoe manufacturing industry in the areas in which it was especially weak. However, LRTI should still invest in further machinery. This problem is discussed later in the present report in chapter III.

Early in 1976 the primary objectives of the Footwear Department of LRTI were established. A chart listing them was prepared and translated into Turkish so that all staff would be aware of them. An English-language version of them is presented as figure I. Most of these objectives have been achieved.

Figure I. Aims and objectives of the Footwear Department

<u>Education and training</u>	<u>Technical information</u>	<u>Development Work</u>
Basic courses	Articles and other information from technical journals	Reducing last requirements by two thirds
Courses in design, pattern-making and upper-cutting	Preparation of a basic shoemaking textbook	Reducing the time required to make a pair of shoes
Upper making	Translation into Turkish of technical publications	Improvement of patterns
Costing		Press cutting
Management		Utilization of materials
Lasting and finishing		Lasting and finishing methods
		Quality improvement and control

Layout of the workshop

A complete plan of the workshop, including the placement of the machinery, was prepared early in January 1976. The electrical wiring was completed soon thereafter. The upper part of the room, where the light was insufficient, and the ceiling of which was low, was partitioned off and furnished with shelves for the storage of materials, lasts and components. This arrangement has been quite successful.

Building regulations require that electric wiring be secured to the concrete floor. Consequently, to save time, all machines were located along the walls except where there were concrete pillars from which the wiring could come. Fortunately, the machinery fitted exactly around the outside of the room. This has meant that the benches for cutting leather and patterns, which require no electricity, were placed in the upper centre of the room. This arrangement has proved to be satisfactory except that the light, which comes from fluorescent fixtures in the ceiling, while generally adequate, is insufficient for close, fine work and colour matching of leathers.

Courses conducted

Course content. In all of the courses, stress was laid on accuracy of work, product quality, and the requirements of mechanized shoemaking. The need was stressed to make shoe manufacturing economically viable so that it can expand and reinforce the need for machinery. This was done by comparing the economics of the hand and machine systems of shoemaking. In many respects, the expert was able to draw many analogies between the present shoemaking industry of Turkey and that of the United Kingdom a century ago. The general policy was to teach improvements in the present situation rather than try to change everything all at once. Such a policy, if continued patiently and correctly, is bound to succeed in the long run. Nevertheless, in Turkey at present, there are certain aspects of shoemaking where handwork can be encouraged with confidence and which, over the long term, will benefit both labour and industry. While all of the courses seem to have been successful, considerable difficulty has been encountered in overcoming certain long-established methods and habits.

Full-time course. At its meeting in April 1976, the Management Board of LTRI recognized the need of the shoemaking industry for trained personnel. A special committee was set up to investigate the establishment of a full-time course. After some initial difficulties that stemmed from the problem of obtaining a suitable local counterpart to the expert, the full-time (40 hours weekly) course was begun in early July. All of the five students were of a particularly high standard, and their application to their work was very commendable. In September, 12 students from the Beykoz-Summerbank factory joined the class.

The conducting of the full-time course brought into relief the major problems of staffing and of making the needed translations into Turkish and in carrying out other important work. It should be mentioned that much of the success of course can be attributed to the support received from the practical shoemaking staff of LTRI.

Short courses. Short courses of upper-making and pattern-cutting were also conducted. In both cases the lectures and demonstrations were given at both the offices of the Footwear Federation in Istanbul and at LRTI. While it had been objected that the distance of LRTI from the shoe-manufacturing centre of Istanbul was a considerable disadvantage, it did not seem to detract from the number of students who attended.

There is a constant demand for courses of this kind for small shoemakers. An important reason for this is no equipment other than knives and similar basic tools are required. Furthermore, the skills learned can be put to immediate and effective use. It is in this area that LRTI can make its first and most important contribution. Other techniques, such as folding, lasting and patternmaking, cannot now be taught in the industry, since the equipment for performing them is non-existent.

Factory planning

The Footwear Federation has been advised on plans for factories with capacities of 250, 500 and 1,000 pairs of shoes daily. These plans were discussed at a seminar held on 23 November at the offices of the Federation. The general requirements of machinery for the Turkish shoe industry were also discussed at that time.

Field trips

During the year, the expert made four field trips: two to Izmir (one day and three days), one to Ankara (three days) and one to Gaziantep (three days). Their purposes were:

- To obtain a clear picture of the Turkish shoemaking industry
- To render on-the-spot advice and exchange ideas
- To stimulate interest in the work of LRTI and encourage people to attend its courses
- To establish the needs of the industry and determine where the primary emphasis of the work of LRTI should be directed.

All of these field trips were successful; the co-operation and encouragement received from everyone was most gratifying.

Problem areas

Lasting

Lasting is a major problem in Turkish shoemaking. LRTI has been constantly engaged in trying to change the concept of lasting, both from the point of view of the methods used and the way in which the shoe is handled. Since the lasts in use have no locating hole, lasting is always done with the worker in a sitting position, with the shoe held in his lap. There is thus a natural tendency to work while seated; the lasting pincers are designed to work at this special angle.

Having persevered for some months, against the background of the making of shoes by hand, to special order, with the staff being unwilling to use machines for a single pair, with high quality being the goal, it was finally possible to change this attitude and to establish machine lasting as a process during which the operator moves from one machine to the next, always in a standing position. Nevertheless, some problems with machine lasting remain unsolved; they result from the inadequacy of the available components. This situation has limited the effectiveness of the work. It is therefore urgent that great efforts be made to obtain better toe-puffs and stiffening materials.

Force lasting

In addition to the 14 pairs of standard lasts for the lasting machinery, the author brought with him a selection of lasts for demonstrating the techniques of slip-lasting and moccasin-making. These types of shoemaking are almost unknown in Turkey, largely because of the absence of hinged lasts. The author has left these lasts in Turkey so as to make it possible to develop this kind of last and manner of shoemaking still further. A complete set of charts showing how to make moccasins was prepared, as well as a set of one size of press knives to demonstrate how such equipment can be used to cut leather cheaply and accurately.

Moccasin-making would be an ideal industry for Turkey to develop, primarily because it would provide employment for hand-stitchers in the rural areas; hand-stitching becomes the basis for the lasting process in footwear of this type. In addition to these benefits for the remoter areas, such an industry would provide a quality shoe for the established markets. It would also encourage hand-sewing, which would provide employment for many.

It would be easy to develop this kind of shoemaking if only LRTI were to make the needed effort to obtain further labour-saving equipment such as press tubes for cutting out all the holes for hand-sewing with one stroke of the press, special moccasin thread for hand-stitching, and binding devices for the Adler machine.

Heat setting of uppers

One of the major problems of Turkish shoemaking is the number of lasts needed, a problem that is compounded by the lengthy time that shoes must remain on the last between lasting and finishing. If the heat setting of uppers were introduced into Turkey, it would have almost revolutionary effects, both technically and economically.

An attempt was made to demonstrate how to produce several pairs of shoes in one day, using a single pair of lasts. Unfortunately, this attempt was unsuccessful except with moccasins, and even these rapidly lost their shape when the lasts were removed. The heat setter that was built and used for this trial did not attain high enough temperatures and requires additional heating elements. The intention was to use this dry heat setter in conjunction with a steam heater. This work should continue in earnest, and a small unit should be built that would utilize radiant heat and could be used experimentally by small hand shoemakers. The needed information on all types and methods of heat setting has been provided by the expert. It is not unlikely that a heat setter, imported at reasonable cost, would pay for itself quite quickly.

Patternmaking

Because accurate patternmaking is vital to precision shoemaking, the Lince grading machine was studied early in the course, and detailed notes covering its operation were prepared, using a simple step-by-step chart for the students to follow. The purpose was to develop a systematic approach to the use of the machine. This study was further amplified in detail during the course, and additional notes were prepared that complemented the chart.

A serious difficulty was that of translation. The first translation of a text into Turkish proved to be valueless, since it had been prepared by someone without technical knowledge of the process, so another attempt had to be made. This problem was a handicap with all technical work.

Nevertheless, the patterns produced are now bound in brass and present the ideal cutting pattern which is so desperately needed in Turkey. The pattern equipment has been fully effective and represents a major development in the shoe industry. However, the basic problems of board and brass supplies require further investigation by the counterpart staff. This breakthrough into an area of great weakness in the Turkish shoe industry should be pursued constantly by LRTI, which should sell the service to the trade so that the patterns thus developed gain acceptance and improve the speed and quality of cutting.

Comment

Any research institute should establish clear and definite aims and objectives. This has yet to be done within the Footwear Department and in the Leather Utilization Department. However, early in 1976, what appeared to be the major objectives of the Footwear Department were outlined. A chart listing them was prepared, translated into Turkish and posted prominently so that all staff would be aware of them. It is reproduced here as figure I. Most of these objectives have been achieved, as least as far as the Footwear Department is concerned. These objectives were also set out in the Project Document (TUR/74/007/D/01/2).

It is in item 2 C III of this document that clarification is needed, in LRTI as a whole and in the Leather Utilization Section in particular. This section reads as follows:

"Extensive use of the Institute's services for which charges will be made and the development of semi-commercial operations should, in time, give the Institute a degree of self sufficiency."

The key words here are "semi-commercial operations". This concept should be considered carefully in the context of the present circumstances and the conditions that prevail within Turkey's shoemaking industry. It is essential to achieve a proper balance of work within the Leather Utilization Section and to establish a rational order of priorities. The present interpretation of this Project Document places too great emphasis on the revolving fund, resulting in a misdirected sense of purpose.

This point requires immediate clarification. If LRTI merely attempts to manufacture products that sell well, it will tend merely to reflect the industry that it is supposed to lead. In the case of the Leather Goods

Department, this criticism is already being made by the manufacturers themselves when they say that LRTI has nothing to teach them. Unfortunately, such statements are quite justified within the present system, whereby all that is done is to secure the services of skilled workers from the industry and have them turn out articles identical to those produced and sold in Istanbul and throughout Turkey and sell them in competition with the industry that they are supposed to serve.

This effort has been unproductive; in fact, it is quite expensive when the staff involved is considered. Furthermore, the articles thus produced must be sold, and selling becomes a full-time activity, to say nothing of the administrative and bookkeeping work that is involved. Of course, a lot of jobs have been created, but little of any real value has been accomplished. In addition, the stress on sales has encouraged the tendency to have special articles made to order. As a result, there is a steady stream of visitors that interrupts work merely to order or purchase special leather goods. It is particularly disturbing that, while every effort is made to encourage this reputation of LRTI with the general public, no similar effort is given to the encouragement of the manufacturers, upon whom the prosperity of the industry will depend, to make use of the facilities that LRTI can provide.

This attitude, together with the policy of encouraging the making of articles to order, has penetrated to the Footwear Department and affected adversely the primary task of trying to mechanize shoemaking operations. By its very nature, shoemaking is very specialized, with special requirements for each different kind of shoe. Consequently, such special, custom work is, in the long run, self defeating. Furthermore, the Project Manager has calculated that the costs involved in making single pairs of shoes are at least double those of buying them in a normal shop.

A report on such costs has been submitted, but to them should be added those of the almost limitless materials and accessories that must be ordered or stored to meet such special orders. However, the greatest loss to the industry in this situation is the waste of valuable time of the staff that could be much better employed in training students and gaining experience with shoemaking machinery.

Having made this point, it is nevertheless true that, even under these unsatisfactory circumstances, much has been achieved in the making of leather articles when applied research was properly directed and training programmes developed. A good example is the making of leather coats, at which high standards of workmanship have been achieved at LRTI. These coats are being made from leather tanned elsewhere, and this material is far superior to that normally used in the Turkish garment industry. In this situation, if basic research in cutting leather to required standards were to be carried out, or if coats were designed to make optimum use of the normally available leather, information that would be useful to the industry could be gathered. However, such efforts are not being made; LRTI is, in this case, competing with local industry on a completely unfair basis.

Achievements during the assignment

1. Courses conducted in pattern cutting, and upper making
2. The plant of LRTI made operational

3. The concept of accurate patterns introduced
4. Knife-making and clicking techniques introduced
5. The upper-making machinery of LRTI made operational and the post sewing machine introduced
6. Introduction of machine folding
7. Introduction of cement lasting machinery
8. Demonstration of force-lasting and mocassin shoemaking; equipment for such footwear for both men and women supplied
9. Establishment of Turkey's first full-time shoemaking course
10. Field trips to Ankara, Izmir and Gaziantep
11. Demonstration of the use of cold-bend steel for press knives, examples left at LRTI
12. Demonstration of the making and use of dies; examples left at LRTI

III. RECOMMENDATIONS

Organization of supplies

It is the responsibility of LRTI, as a government agency, to ensure that essential supplies are available not only for itself but for the industry that it serves. It must begin with the sources of supply and co-ordinate all the efforts of all sections of the industry towards the achievement of improved efficiency and consistency of quality in the supply of materials and components. That this can be achieved has already been demonstrated as regards pattern board. Furthermore, LRTI should be adequately funded; streamlined procedures and communications would be of little avail if funds were not available to make the required purchases. Consequently, during the final phase of the project, LRTI must acquire the ability to order - and to pay for - supplies of materials and spare parts from any part of the world. This can be done only at the governmental level; it is only there that the problems of currency, customs and import restrictions can be solved.

In its own area, the Footwear Department of LRTI must build up stocks of essential supplies, including spare parts. Specifically, the older machines should have the same inventory of spare parts that is provided for new ones. With all machines, whether new or old, the Footwear Department should be able to order and receive, without delay, whatever spare parts it may require. The existing machinery and the spare parts and supplies that they require are listed in annex III.

Location of the Footwear Department

It has been suggested that the Footwear Department be located either centrally in Istanbul or near the Beykoz-Summerbank factory rather than remain at LTRI in Pendik. It would be a mistake to move the department at all. While there is obviously a case for conducting many activities such as demonstrating methods, giving lectures and presenting ideas in Istanbul, what is really needed is a national centre where learning can be divorced from the local situation. It must be understood that, if the department were to be moved, the back-up facilities at LRTI that are so advantageous to the industry and to the courses themselves would be lost. In the present situation, tanning, testing and laboratory work can work together for the benefit of the industry as a whole, and it is precisely this kind of co-operation that the shoemaking industry presently lacks. The present facilities are, in many ways, unique in the world. The effort of the tanning industry to help the shoe industry through LRTI sets the ideal conditions for development of the industry and the training of its personnel.

The practical footwear workshop should be provided with rear exit doors. They would facilitate the movement of machinery in and out of the department and would make it more convenient to bring in general supplies. At present, everything must be brought in through the front entrance, which is at the top of a long flight of stone steps. Another advantage would be that, in case of a fire that blocked the present entrance, the rear entrance would provide a way of escape.

Leather utilization

At LRTI, the above heading is used to include the manufacture of footwear, leather goods and leather garments. While these three departments should retain their independence as specialist departments, they should co-operate more closely than they now do. There is a need for a department head for each of these three sections, but there must be close liaison among them. The lead for this must come from the Director level. Three reasons for such co-operation are:

1. The concepts of design and fashion are valid for all three departments. The students should be taught to integrate individual shoes or leather articles into an overall fashion element.
2. The methods used in the three departments are closely parallel and in some cases identical. For example, the same kind of band-saw that is used to cut boards for handbags is used to cut the insole boards for slippers. Other examples are press cutting and patterns; both of these processes, which are vital to leather goods, are equally important in shoemaking. There is an urgent need to develop patterns and press cutting in the leather goods industry, where a few manufacturers employ a press with deep-forged knives. The benefits obtainable from co-operative research would lead to much more rapid development if there were wider application, which would make the economics more attractive.
3. From the standpoint of training and education, there is an inevitable overlap of subject matter that would permit savings of time and effort to be made. Subjects such as sewing, leather, and adhesives all have fairly common backgrounds; class notes can be prepared with this in mind.

The Leather Section of LRTI can and should continue the development of upper leathers intended specifically for mocassins and also of goatskin leather with a lining to minimize wrinkling. Both of these materials have great potential for a mocassin-making industry.

However, as pointed out in annex II, Shoe manufacture in Turkey, there is absolutely no concrete support for such a project; until it is forthcoming, no further support should be provided for it by international organizations. Great opportunities are being lost; this is definitely one area in which, without firm backing from the relevant government departments and the senior staff of LRTI, no progress will ever be made.

Objectives

If any real progress is to be achieved in the Turkish shoe manufacturing industry, it must establish a series of objectives. Many are suggested below, the first few being the most important. Indeed, the first two are vital; unless and until they are attained, any help rendered by agencies of the United Nations can have only partial success. Quite flatly, before any further assistance is provided by international agencies, there must be a firm commitment to resolve these two primary difficulties.

There have been many instances where an expert has demonstrated a new technique, but its introduction into the industry has depended on the importation of essential equipment and materials, and permission to import them

has been withheld. It must be said that on each such occasion there has been reluctance to have the Government import them or even to try to find them in Turkey. The result has been that progress has been impeded, if not blocked, in almost every area. Under such circumstances, little or no real progress can be expected. Thus, if the two first objectives are not achieved, there will be no point in trying to work towards the others.

1. The Government must act to remove, or at least to reduce significantly, the levels of import duties on essential equipment, materials and components for the development of LRTI and the shoe manufacturing industry. A system should be developed that would permit LRTI freely to import the materials, machinery and spare parts required for research, training and development projects.

2. Corresponding action must be taken by LRTI to ensure that supplies of equipment, materials, spare parts and components are ordered and obtained. The responsibility for the implementation of this important work must be assigned to a specific and competent person who has been vested with sufficient authority to perform his task.

Only when these two steps have been taken - and not before - should further assistance to the shoe manufacturing industry be provided.

3. If the continuity and progress of this project are to be maintained, a suitable Turkish counterpart to the international expert must be assigned to LRTI on a permanent basis. This requirement in no way discredits the achievements of the present staff, who have pioneered the establishment of the Footwear Department at LRTI, but they must have the continuing leadership of a fully qualified and competent individual. The lack of such a person has been a serious handicap. Turkish Government and the international organizations involved in the project should try to resolve this situation immediately for the good of LRTI and of the industry that it serves.

4. An advisory committee for LRTI should be formed of persons who are concerned with the shoe manufacturing industry and its well-being. Its function would be to make recommendations to the Management Board on policy and development work in the Footwear Department.

5. The Government should give earnest consideration to the future of staffing research institutes, including LRTI. The importance to the staff of incentives, including remuneration, must not be overlooked.

6. Marketing and the formation of co-operatives should be the responsibility of some of the resident staff of LRTI.

7. LRTI should provide an advisory service for shoe manufacturers on all aspects of leather.

8. The extension services of LRTI should concentrate their efforts on the small workshops (ateliers), providing them with technical assistance on the spot and providing facilities at LRTI where they could gain experience, with a view towards the formation of co-operatives or the starting-up of small-scale factories.

9. There should be closer liaison between the shoemaking and leather goods industries to facilitate joint technical advancement and mutual assistance.

10. In all projects and programmes, concentration should be on modern concepts rather than continued reliance on traditional ones.

11. Immediate action should be taken to update the printing facilities at LRTI, which are totally inadequate.

12. The technical translation service of LRTI should be extended and should become a service to the entire industry.

13. LRTI should foster co-operation in design with the centres of fashion and design in Istanbul and Ankara at all levels and encourage the updating of Turkish design in all fields of leather utilization.

14. There is a pressing need for instruction and research in every aspect of shoemaking in Turkey. LRTI should have on its staff people capable of conducting six-month courses in the following subjects:

- Pattern cutting and design
- Upper cutting and casting
- Upper making
- Lasting
- Making
- Finishing and pre-finishing
- Shoe room

15. The present short courses in pattern cutting, pattern making and lasting should be continued. A small vacuum forming machine should be built or purchased to develop this method of pattern cutting.

16. LRTI should endeavour to produce a handbook on pattern cutting based on the lectures that have been given and on existing textbooks in languages other than Turkish that are suitable for translation.

17. In addition to a long-term programme of training and research, a definite short-term programme with immediate objectives should be set up.

18. The highest priority should be given to last making; without proper lasts, the Turkish shoemaking industry can never develop. The Government-owned Beykoz-Summerbank shoe factory should be assigned responsibility for assisting the industry to introduce modern lasts. An expert in last making will be required to determine the basic equipment required for the manufacture of lasts, assess the present situation of Turkey's last-making industry, investigate the possible degrees of standardization of Turkish lasts and the availability of wood suitable for making them. There is also a need to investigate last making in outlying areas. For example, Gaziantep could well require a last factory. In this connection, it cannot be over-stressed that every effort should be made to introduce hinged lasts into the industry.

19. Closely related to the above is the need to develop the force lasting of leather shoes. While work in this area has already been begun at LRTI, no

real progress can be expected before the problem of Turkish lasts has been solved; all of the lasts in use at LRTI are of European origin. This is a typical case in which modern methods being taught at LRTI with imported equipment just cannot be put to use in the industry. This makes the adoption and implementation of points 1 and 2 of this listing the prerequisites for any real progress in the industry.

20. LRTI should offer a three- to six-month course on the utilization of materials, much like the first series of lectures by the expert on the cutting of leather for uppers. This course should be expanded to include the cutting of soles, insoles and other components.

21. Uppers making will be an area of particular weakness in the near future. LRTI should acquire the proper machinery (modern sewing machines, punching and binding machines) and use them to conduct continuous courses in this important area.

22. A competent person should be trained by an expert to test materials and components. Once trained, he should be sent, constantly, to shoe factories all over Turkey to provide on-the-spot know-how and advice.

23. An expert should be assigned to develop the use of modern finishes in the Turkish shoe manufacturing industry. This assignment would involve work with finishing supplies factories in Turkey and the demonstration of various new methods. It might well be advisable to award a fellowship to a suitable candidate to study subject in Europe.

24. Work on the development of heat setting should be completed. This process is necessary to speed up shoe production, improve the shape-retention of the uppers and reduce the number of lasts required.

25. Shoes should not be made to individual order except as part of training or in connection with development work.

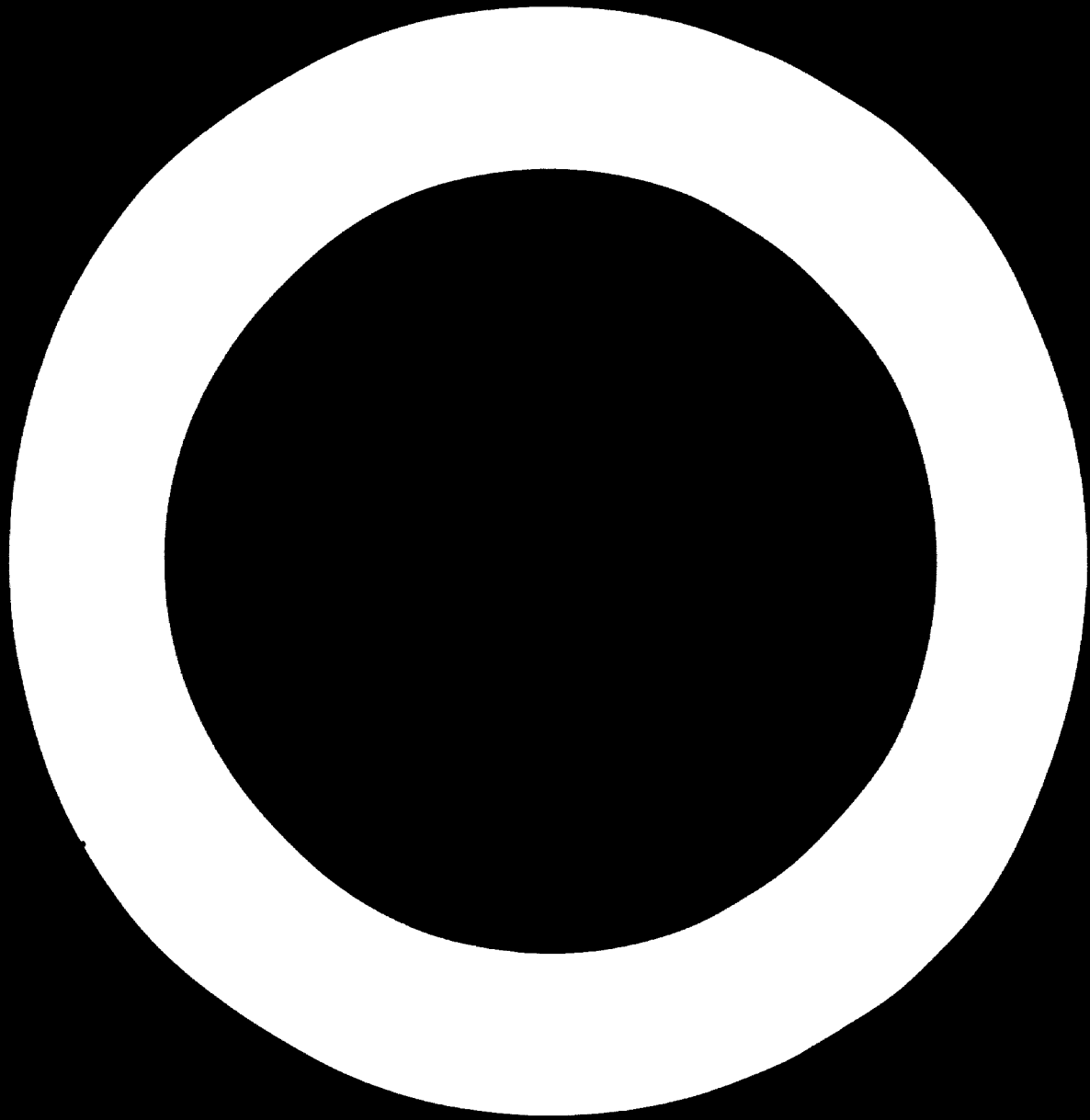
26. There should be close co-ordination of such activities as the grading of leathers, spray finishing and the testing of materials that have a direct bearing on the shoemaking industry.

27. Goats are abundant in Turkey, and their skins could form the basis of a shoe production with substantial export potential. Two approaches to this possibility may be suggested: working with the two manufacturers who have already made good progress in this direction and improving their methods, or assigning an expert in this kind of shoemaking to LRTI for one or two months.

28. A very good beginning has been made in the development of the sticking-on process, but both a good press for this purpose and a modern adhesive-activation unit are required.

Final comment

Inspection of the foregoing long list of recommendations to LRTI, the shoe manufacturing industry and the Turkish Government for the progress and development of shoe manufacturing in Turkey reveals that there is very much to be done in very many areas. All of these recommendations are practical and desirable, but they would have to be implemented in an orderly and systematic manner. As noted at the outset, at very least the first two of these recommendations would have to be fulfilled before any action is taken on the others. The third and fourth recommendations are of only slightly less importance.



Annex I

WORK PROGRAMME OF THE EXPERT
(16 January - 8 December 1976)

16 January	Arrival and entry on duty
16 January - 16 February	Worked out plans for workshop layout and placement of machines Electrification of workshop Building of storage for materials and components Preparation of teaching charts Organization of programme and syllabus for courses Assessment of existing machinery and examination of ordering catalogues Design and construction of the pattern-cutting table Visits to shoemakers to determine what courses would be most needed
February - March	Preparation of patterns and ordering of press knives Purchase of components and materials Preparation of samples and lists of suppliers Preparation of shoe patterns Further preparation of teaching charts Conduct of lectures and courses for the full-time leather students
March - April	Installation of lasting machinery and some other equipment Preparation of materials for lasting trials Running in the new equipment Start of the first course in upper-cutting and making Continuation of the classes for full-time leather students
April - May	Continuation of first course in upper-cutting and making Additional work with the lasting machinery Visit to the military boot factory at Yesil Kondura

One-day field trip to Izmir to assess the shoe-making industry there, especially the factory Safak Kondura Sanayii at Yesildere, Izmir

June Start of the second course: pattern cutting and design
Demonstrations of patternmaking equipment
The first brass-bound patterns produced sent to Istanbul for trial

July Meeting of the Advisory Panel for Footwear
Priority assigned to the establishment of a full-time course in shoemaking at LRTI
Preparation of the full-time course
Full-time course started with five students and an interpreter

August Continuation of the full-time course
Visit with students to Beykoz-Summerbank, to see last plant and shoemaking factory

September Extension of the full-time course with the added participation of 12 students from Beykoz-Summerbank
Secondment of counterpart from Beykoz-Summerbank

October Continuation of the full-time course, with increase of advisory services to industry and study of the methods in use

21-22 October Visit to shoe factories in Ankara and attendance at United Nations Day meetings at UNDP headquarters

November Continuation of full-time course

2-4 November Visit to Gaziantep to inspect shoemaking industry there and study a small-industries project dealing with the formation of co-operatives

22 November Special lecture at the office of the Footwear Federation in Istanbul on the development and problems of the shoemaking industry

23 November Seminar on factory planning at the office of the Footwear Federation

25 November Debriefing in Ankara

29 and 30 November Debriefing in Vienna, end of assignment

2 December

Meeting with Erdal Serac in Eastbourne,
United Kingdom to arrange factory visits

6-8 December

Met Musfik Bey and party of four (including I.
Comuk) and, with Erdal Serac accompanied them
on visits to machinery and shoe factories

8-10 December

Met Altan Behçet and party of three and
conducted them on factory visits and rendered
advice

Annex II

SHOE MANUFACTURE IN TURKEY

Introduction

One of the fundamental problems in directing the work of LRTI is acquiring a full understanding of the ways in which shoes are made in Turkey so that the most valuable help can be given. Since there is such a vast number of workshops, it is unlikely that anyone has a complete picture of how shoes are made in the various parts of the country. LRTI has been constantly finding different approaches being undertaken for which serious consideration must be taken in terms of training, machinery and direction of development. The present report is an attempt to describe the situation as it was found to exist during the year 1976 and to make recommendations. This work must be extended; LRTI must build up a library of information on Turkish shoes, how they are made, and the materials and components used.

Footwear production

According to the five-year plan for the footwear industry published by the Government in 1976:

About 33.5 million pairs of leather footwear are produced annually, about 4.5 million of which are produced in factories, the remaining 29 million in the small workshops (ateliers).

About 29 million pairs of rubber and plastic footwear are produced annually by about 30 manufacturers.

The government report does not classify slippers as a separate item of production, but the Slipper Federation reports that the weekly production is about 50,000 pairs, or about 2.5 million pairs/year.

Of the total, the 15 Government-owned and private mechanized factories account for 20% of production; the semi-mechanized plants for 25%, and the small workshops, of which there are supposed to be about 30,000, account for 55%. The Government-owned Beykoz-Summerbank plant produces 1,860,000 pairs yearly, which is said to be 6% of the total.

Centres of footwear production

The main centres of footwear production are the Istanbul area (65%); Izmir, Ankara, Adana, Gaziantep and Bursa (20%); the remaining 15% are scattered all over the country. These figures show the importance of Istanbul. Furthermore, the other shoemaking centres lean very heavily on the services supplied in Istanbul as regards tooling, materials and components.

Shoemaking in Istanbul is centred around the Bazaar area, where there is a very closely knit community and a remarkable degree of organization that has developed over many decades. One of the reasons why the industry is so firmly established in this area is not only that it is the traditional area of so many trades, but that there are the enormous back-up facilities so necessary for shoemaking. It is these facilities that are largely responsible for the slow movement of the industry to other areas, as well as the communal passing of work from one workshop to another during the making of the shoe.

The fact that shoemaking relies so heavily on tooling, components, materials and machinery means that, to achieve the same degree of efficiency that at present exists in these fields is very difficult if not impossible to match elsewhere; an example is the almost total dependence on Istanbul for lasts. Last manufacturers, heel manufacturers, component and tool shops, freelance designers and pattern cutters, and perhaps even more significant, the vast supply of spare parts and machine repair shops are all available in the area surrounding the Bazaar. To move from this area and start up an independent shoe factory means that either a high degree of training and knowledge is required or the ability to organize groups into co-operatives or into independent factories to achieve the same end.

When considering moving these shoemakers to another area, careful consideration should be given to these factors, otherwise the considerable skills available in this area could well be lost. One must not only consider the shoemakers but the vast area of supplies in materials, tools and components. There should be no forced movement of this shoemaking centre, but rather the creation of conditions which would naturally cause expansion of which these shoemakers would soon take advantage, as many are now doing.

Another point to be considered is the continuation of handicraftsmen and bespoke shoemakers; the importance of this work should not be overlooked at the expense of mechanization. The traditional skills could well prove valuable exports as Istanbul expands as a major tourist centre, and there could well be an advantage in maintaining a small area to serve these needs.

Whatever decisions may be taken with regard to this shoemaking area, it must be realized that it is the most significant shoe centre in Turkey and would certainly be an international centre, given the right backing in terms of machines, components and materials.

Contrasts in the shoe manufacturing industry

There are two sharply contrasted sectors of Turkish shoemaking. On the one hand, there are the small manufacturers (ateliers) which, in order to survive, must make even the most difficult shoes almost entirely by hand, with an ever-increasing range of designs, lasts and innovations. The mode of such a small shoemaker, with a weekly output of between 100 and 150 pairs, is outlined in table 1. It can be seen that his basic capital outlays are for the lasts and for the materials, the cost of which is substantial. Most such small operators are unable to pay cash for their materials and must rely on a system of credit that entails a considerable increase in their cost. On the other hand there are the factory shoe manufacturers who, also in order to survive, must make shoes of the same design and last shape, year in and year out, at the lowest possible cost. In this group are included not only the large-scale manufacturers of conventional shoes but also the mass producers of non-conventional footwear described in annex IV, Shoe construction in Turkey.

Broadly speaking, this is the present situation of the Turkish shoemaking industry. However, it is the firm opinion of the writer that the elimination of tariffs on certain essential supplies would lead immediately to rapid expansion of the industry and increase the profitability of further vital investment.

Table 1. Flow-sheet of the usual system of work of small Turkish shoemakers a/

1. Designs and cuts own patterns
2. Grades with a hand pantograph (equipment cost: LT 2,000)
3. Purchases lasts (cost: 300 pair for LT 20,000)
4. Purchases enough leather for two months, at a cost of LT 57,600 on credit terms or LT 43,200 for cash
5. Purchases linings for LT 12,000
6. Cuts outsides and linings
7. Sends out leather for upper-making. (Cost: LT 12 to LT 30/pair, depending on style. For this small quantity, a shoemaker or cutter may do this work himself.)
8. Lasting. Five lasters will produce 30 pairs/day at a cost of about LT 23/pair.
9. Purchases sole leather. (A two-months' supply would cost about LT 36,000.)
10. Sends out soles for stitching. (Cost: about LT 3/pair)
11. Soles returned to lasters for the attachment of heels and closing of channels.
12. Sends shoes out for finishing. (Cost: LT 5/pair)
13. Shoes returned to shoemaker
14. Socks are inserted by shoemaker
15. Finished shoes sent to dealers

a/ Output: 100 to 150 pairs/week.

Small shoemaking workshops (ateliers)

As noted, small workshops (ateliers) predominate in Turkish shoe manufacture. About 30,000 of them are estimated to exist, producing about 29 million pairs/year of leather footwear. They tend to concentrate in areas where facilities, materials, components and machine maintenance supplies, as well as sole stitchers and finishing machinery are available. The two principal centres are Istanbul and Izmir. Other areas without such back-up facilities have not yet developed; even Ankara has neither a last-making plant nor press-knife facilities.

The machinery in these small workshops usually consists only of a skiving machine and a flat-bed sewing machine; sole stitching and finishing are done in specialized workshops. There are also workshops that specialize in cutting, upper-making and lasting, which is done by hand. The usual flow of work in the ateliers has been shown in table 1. Payment is based on a price per pair, usually inclusive of materials and components. Considering their limitation as regards materials and components, the quality of the shoes made in these small workshops is excellent. There is an unlimited range of styles and designs.

Table 2. Characteristics of 15 shoe factories that produce 4.5 million pairs of shoes yearly

Military footwear factories (3)	Government (Beykoz-Sumerbank) factory (1)	Fashion shoe factories (2)	Vulcanized shoe factories (9) <u>a/</u>
<p>Military footwear only</p> <p>Constant styles: no designs of patterns or styles</p> <p>Obsolete methods</p> <p>Highly labour intensive</p>	<p>Military and plain civilian footwear</p> <p>Only factory using hinged lasts. Has its own last-making plant</p> <p>Poor designs and patterns, little development</p> <p>Low to medium quality</p> <p>All work is hand folded</p> <p>Effective use of post sewing machines</p> <p>Insufficient good, well-trained staff</p> <p>Has separate department for making special orders and quality shoes</p>	<p>The only factories that up-date designs and produce a wide range of styles</p> <p>Excellent quality: of export standard</p> <p>Very low production</p> <p>Very low machine utilization</p> <p>Imports components and some materials</p>	<p>No conventional lasts: upper with sewn in sock-force lasted on metal feet</p> <p>Constant styles to utilize press knives</p> <p>Technical break-through in bonding sole without roughing</p> <p>Low machinery costs: all Turkish machinery possible</p> <p>Low labour costs</p> <p>Export potential with improved machines and components</p> <p>Financial problems in maintaining stocks during slow sales periods</p>

a/ See annex IV, Shoe construction in Turkey.

While this system has many disadvantages, it ensures nearly complete independence of the workers, allowing them the freedom to work pretty much as they choose. Although most of them work 12 hours daily when work is available, they can work more or fewer hours, as they prefer. However, working conditions in this branch of the industry are very poor. The work day tends to be long, there is little security and employment is unstable owing to fluctuations in demand and the lack of financing to maintain stocks. Skilled labour is used ineffectively, owing to traditional, outmoded work methods, poor organization, and the use of juvenile labour to keep costs down.

Major materials such as sole and upper leather are often purchased on credit at very high prices. Wastage of material is high except in the few shops that have acquired presses and can cut directly. Such progressive small shops appear to be the only profitable ones; they alone seem to have any real prospect of development. Most of them merely maintain an existence. In general, the small operators do not know how to develop or what machinery they should try to acquire. There is evidence that some of them are being exploited by machinery suppliers who organize credit facilities through a bank. Spare parts and such simple equipment as press tubes, which would increase the profitability of shoe manufacture and release skilled labour, are virtually unobtainable by the small enterprises.

Factory production of shoes

As noted at the beginning of this survey, there are some large-scale shoe factories. With the exception of only two, these factories, in order to survive, make shoes of the same design and last, year in and year out. The characteristics of these factories are presented in table 2.

This table amply illustrates the limitations of the Turkish shoe industry. The greatest development has occurred where innovation has by-passed the obstacles of lasts and lasting. The success of the two fashion factories can be attributed largely to their success in importing materials and components. Neither the government plant nor the military factories have had any influence whatsoever on the development of Turkish shoe manufacturing.

The Beykoz-Summerbank shoe factory

This factory produces some 1,360,000 pairs annually. The production consists of military boots, a large proportion of plain black Oxford shoes with either injection-moulded PVC soles or machine-sewn leather ones. Recently, there has also been the introduction of a cheap canvas shoe that is string lasted directly onto the metal moulds and with an injection-moulded PVC sole and a complete high-frequency welded upper with cement lasting and a stuck-on sole unit, also of PVC.

The work is only of low to medium quality. Considering the simplicity of the standard models produced, both the methods used and the product obtained are inferior. This is speaking in general terms, however, since some operations, notably skiving, have achieved high levels of performance and quality.

In order to provide some level of quality shoemaking, the factory has a small centre that produces made-to-order shoes, using the same methods and techniques that exist in Istanbul and elsewhere. The centre is said to be subsidized, and this situation gives some indication of the problems involved in making shoes of reasonable quality and design. Even with all the resources of a government factory that can import materials and equipment duty free, bespoke shoes must still be made completely by hand.

In most instances the output per operative is very low, and in many instances there is duplication of operations. This has been brought about by not solving a problem at its source but taking the easy way out of simply having another operative correct work that was done incorrectly in the first place. Before any progress could be made at Beykoz-Summerbank, this general attitude that has crept into the system must be changed; this is basically why the quality is so low. For this reason the role of LRTI is so important, not only in teaching methods and techniques but in establishing the important principles and conditions that will make development possible.

Mainly for these reasons, the Beykoz-Summerbank plant has a very limited effect on the industry at large, whereas it should be a driving force, helping to mould the general industry in Turkey. An example of this is the last factory, which with a large plant and a good-sized drying oven for the wood, only produced between 25 and 30 pairs daily for internal use. If this plant were to be used to full capacity, the benefits to the industry would be enormous, and the benefits to Beykoz-Summerbank in keeping abreast of current trends in last and model design would also have a far-reaching influence. There are indications that these facilities could well be made available to the general industry, and thanks should be given to the directorate of this factory for giving such careful consideration to implementing this policy.

Another serious condition at the Beykoz-Summerbank factory is its almost total lack of development in design and pattern cutting. This situation arises from the fact that the output of the plant consists overwhelmingly of military footwear and a plain black Oxford civilian shoe, which are being produced year after year without modification. As a result, there is an almost total lack of staff trained in pattern cutting and design as related to the techniques in the factory production of shoes. This lack affects not only the Beykoz-Summerbank plant but the entire factory sector of the shoe manufacturing industry, in which Beykoz-Summerbank, as government owned and large in scale, should be the driving force. For the time being, the Beykoz-Summerbank plant can continue to operate in this manner, since it has no real competition. However, the time must come when it will no longer be possible to continue producing the present limited range of styles. In anticipation of this development, the Beykoz-Summerbank plant alone will require, continually, as many design and pattern cutters as are now being trained at LRTI.

Military footwear

Of the 15 large-scale shoe factories, at least three are solely engaged in making military footwear. One of these plants produces between 5,000 and 5,500 pairs/week and employs 150 people, for an average output of seven pairs/worker/day. This type of military boot is unique in the shoemaking world. Basically, it is a Goodyear welt construction without the actual welt; instead, the upper is flanged outwards after welt sewing and is stuck and stitched to the outsole. The welted work is done on a vulcanized rubber moulded rib stuck to a leather insole. A PVC rand is stitched to the welt during the outsole-stitching operation. A heel is attached, first with adhesive and then with nails and finally, after last-slipping, a further row of lock-stitching is done right through the insole and the outsole, which is set in some distance from the edge.

This type of construction is said to be stipulated by the military authorities, although the use of a direct-moulded vulcanized shoe has been recommended. European military boots are usually direct-vulcanized or, more recently, have

direct-injected polyurethane soles. Both of these processes would produce a lighter and better boot and would save about 66% in direct labour costs and release valuable production space and capacity for the production of other types of footwear.

One consideration might be that to introduce such a process would cause hardship and redundancies, but the labour force could easily be transferred to the production of veldschoen, the sales potential for which should be very great in the Turkish climate. The new processes would therefore release labour and machines to produce more shoes, which are badly needed. There would also be significant savings in costs of materials.

Future needs for technicians

Since most of the large-scale shoe producers make the same kinds of shoes year in and year out, development work as regards new materials, tooling, and new designs is limited or even, in some cases, non-existent. Consequently, patternmaking equipment, as well as press knives, markers and the like, are used to a very minor extent; there are no skilled operators to do this work. In one factory a grading machine was seen that had not been used for a considerable period, and this at a time when the industry at large is in the direct need of such equipment.

Most shoe manufacturers would agree that a technically successful shoe factory evolves largely around the design, tooling and pattern offices. In Turkey, however, because of the continual production of the same limited range of shoes, this kind of work hardly exists. If the Turkish shoe industry is to move into the present and become competitive, it must have people who can cut patterns and tool up for machines and new materials within the factory system. The 15 shoe manufacturers must always provide a nucleus of students in training to meet the future needs of the industry.

Technical problems

Materials

Another reason for the supremacy of Istanbul as a shoe-production centre is the availability there of materials, and particularly of leather. Shoemakers come from all over Turkey to purchase their leather requirements from the main centre at Kazlıçesme. The knowledge of leather and how to buy it is an important factor in the economics of shoemaking. There is little consistency in quality, which makes mechanized shoe manufacture very difficult, and the material is high in price. For example, the expert was informed at Gaziantep that a small shoemaker had had to pay LT 24/10 dm² for leather of very poor quality.

Shoemakers should be encouraged to seek help from LRTI in this area; a course in the evaluation of leather would be very valuable. At present, in the full-time course at LRTI, students are taught the fundamentals of leather technology. The problems encountered with leather are also found with other materials, not only as regards quality but also of supply.

Governmental restrictions on the imports of materials has limited the abilities of Turkey's shoe industry to develop and to export. To be exportable,

footwear must be consistent in quality, and in its present state, the Turkish industry cannot compete. A few years ago, the respected authority Gordon Bailey reported on the Portuguese shoe industry in terms that could be applied to Turkey today. He wrote that: "No country can be self sufficient with regard to new high-fashion upper materials. To compete successfully, it is necessary to import between 30-50% of the raw materials and to do so with the certainty of no customs delays." He further noted that tariffs on these items were so high that the shoe industry was affected adversely. As a result of his report, Portugal lifted all barriers to the importation of shoe materials in 1971.

The present situation in Turkey is directly comparable; the making available to the shoe industry of up-to-date materials and components would have a profound effect. As things now stand, the two most successful shoe manufacturers in Turkey produce shoes that could easily be exported. These manufacturers somehow manage to import components, and their success is attributable to this.

Modern shoe machinery is designed for use with modern components; because of this, in many cases it is difficult to advise manufacturers about the purchase of machinery. The need for strong supporting industries has been stressed in the Government's five-year plan. It must be understood, however, that they can develop only if the restrictions that presently hamper the shoe manufacturing industry are lifted so as to make its economic expansion possible.

Italian influence

Italian influence predominates throughout the Turkish shoe industry; everything is modelled on Italian lines. Italian-type shoes, not only from Italy but from all over the world are used as models as regards design and quality. This awareness of the supremacy of the Italian shoe industry and the intention to model the Turkish shoe industry upon it are well founded and realistic. Those few who can travel regularly to Italy do so, and in some cases we have found that factories have been directly copied on Italian lines.

The entire success of the Italian shoe industry apart from its lead in shoe design and styling, is its flexibility, based on small units rather than the large-scale mass-produced shoes, where changes of design and tooling are difficult, with high overheads that must be covered for large-scale production. The small unit also lends itself to tighter control of quality and the ability to specialize in one section of a given market. Throughout Istanbul the shoemakers copy their designs from Italian fashion books, and most of the lasts are also either copied from Italian ones or are based on Italian lines.

Design and pattern cutting

It is doubtful if there are any original designers in Turkey, the system there being to copy directly from Italian fashion magazines or to buy original models from Italy. Within Istanbul alone there may be as many as 50 free-lance design-pattern cutters offering their services to industry. Italian magazines such as Moda Pelle and Ars Sutoria are available in these pattern offices, and visiting shoemakers provide their own lasts and select designs from these magazines. The system that follows is to give the magazine a

number, to record the page on which the design was chosen and the number of the design on the page. This is then recorded on the customer's last and remains the main reference or design number. For example, 37 (catalogue No.), 23 (page No.), 2 (design No. on page). The charges made for this service are roughly as follows: LT 50 for a pattern, and this may be increased for more difficult or complicated patterns, such as boots. If the design and pattern office offer a grading service, as many do, charges are based on a group of sizes, usually six at a standard charge of LT 30/set. Where the patterns are large and cannot be graded all at once, the charge is doubled. A pattern-cutter designer may produce between five to ten designs and patterns in one day.

Two basic techniques for obtaining the surface area of the last have been seen; moulding brown paper on to the last, and using very wide adhesive tape. These patterns are produced very quickly but lacking the accuracy required for machine lasting systems. The grading of patterns is done with a hand pantograph. The accuracy of this instrument has been compared with that of the machine at LRTI, and there appears to be only a marginal difference at the joint position, where the hand pantograph gives slightly extra width. The limitations of the hand pantograph are with the grading of insole and outsole patterns; to do these a special metal rule is used with which the length is graded in four distinct movements. The training of pattern cutters and designers is of fundamental importance for the industry. There should be a constant supply of candidates for such training at LRTI.

There appears to be a general weakness in the production of children's patterns that is reflected in the shoes. Perhaps the main reason for this lies in the reluctance of good manufacturers to enter this trade owing to pricing problems, since hand shoemaking labour costs are likely to be similar for shoes of any size.

Press-knife steel

Press-knife steel is one of the essential materials from which import restrictions must be lifted. This refers specifically to cold-bend steel which, 20 years ago, brought about large-scale press cutting. This steel is not yet available in Turkey and will not be for another two years, and then only from a small pilot plant at the Marmara Scientific and Industrial Research Institute at Genze-Kocaeli, which is under the auspices of UNIDO. The industry has expressed its willingness to co-operate when this plant is ready, but in the meanwhile it cannot use the most economic way of cutting except on a very limited scale.

If Turkey is to become competitive with a view to entry into the European Economic Community (EEC), this steel must be made available so that costs can be cut and productivity raised. At present, skilled craftsmen make forged steel knives from scrap steel at very small cost, but even these are at least twice as expensive as cold-bend steel press knives; the time to make them is measured in hours rather than minutes. The introduction of press cutting on basic components alone, such as toe-puffs, stiffeners, insoles and outsoles, would revolutionize the industry. Those who have seen engineers produce machines for working the cold-bend steel and then find themselves unable to obtain such material for themselves and the industry find this difficult to understand.

The few manufacturers who have such knives have imported them ready made from Italy. This is one of the reasons that factory producers cannot change their patterns frequently; each time they wish to, they must travel to Italy to purchase and import the knives. Furthermore, such importation is, strictly speaking, contrary to regulations.

The ready availability of modern press-knife steel is a prerequisite for increased profitability, since it would permit great economies in labour and materials. It would also significantly reduce the time required to produce a pair of shoes. It is worth mentioning that the use of this material would be equally advantageous in the leather goods industry where it would permit substantial savings.

It so happens that there are two exceptions where factories are able to import this material; namely the military boot factories and the Beykoz-Summerbank plant. However, they very seldom do so, because, as has been noted, their styles never change.

Patterns and hand cutting

While press-cutting is recommended for essential components, it is not envisaged on a wide scale for upper-cutting in the immediate future. In small-scale manufacturing, particularly with constantly changing styles, hand cutting is more economic; the cutting press will never displace the skilled hand cutter. It is thus necessary for hand cutting to be encouraged and improved, thus ensuring a proper balance between the two methods. Given the proper tools, the hand cutter should have a long and prosperous future.

The basic tools that the cutter requires are improved patterns and good-quality steel for his knives. It is the lack of these tools that has limited development and explains why the speed and quality of cutting in Turkey are below European standards. Only two exceptions have been noted, both in Izmir, where cutters have made patterns from metal, laminated between two layers of thin board. Their performance has been remarkable; in all probability, they will double present production.

At present, the standard pattern in the industry is of very thin board; the cutter must take great care not to damage it. With a brass-bound pattern, such as LRTI now supplies, the hand cutter has a solid edge on which to guide his knife and will be able to develop, naturally, a greater speed of movement. Furthermore, the effort and concentration required to avoid cutting into the pattern will enable the cutter to work in a more relaxed and easy manner.

As noted on page 13 of the body of the present report, LRTI has made great advances in pattermaking and is ideally situated to train and assist all sections of the industry in this area. The equipment at LRTI should be in constant use to introduce the new methods and exploit their advantages. LRTI must sell this idea and try to overcome the inertia of the background of small-scale work, which the shoemaker is naturally reluctant to change, since the immediate benefit will be small. Over the longer term, however, such efforts would have far-reaching effects as regards improvements in skills, quality and efficiency.

It has been calculated that the materials for a standard set of patterns would cost about LT 100; the time to make them would far exceed those made

by the hand-grading system. However, on orders for more than 100 pair, a cost advantage would soon be apparent and, more importantly, a higher standard of accuracy would be achieved. If these new patterns can be first introduced in large, standard-type work, they will soon gain acceptance. The fact that, in Izmir, some have gone to the trouble of cutting out metal patterns by hand, using snippers, indicates the success that they have achieved. With the grading and pattern equipment that it has, LRTI will be able to produce patterns far more quickly and accurately.

Upper making

Upper making is an area of shoe manufacture that will require the greatest attention in the future. At present this problem is overshadowed by that of lasting, but problems are already arising because of the lack of machinery and skilled labour in this field. Uppers are now usually made by skilled specialists on flat-bed sewing machines. Such a specialist will complete the entire upper stitching, receiving a price per pair that has been negotiated with the shoe producer. This price will depend upon the type of upper being made.

A contractor of this kind, when established, can employ as many assistants as he may need to increase his production by fitting the parts together so as to reduce handling time. These assistants are paid at an hourly rate. Other hand work such as folding, punching and thread clipping are also done in this manner. Very much of this work is done by very young workers so as to keep costs down.

The amount of hand work required to make some uppers makes them impossible to produce without assistance. A typical example is the brogue-type shoe with much punching and stitching, which must all be done by hand; a labour cost of LT 35/pair is not unusual. Without the support of such hand workers, the upper contractor would seldom be able to operate his machine. Considering the limitations of space and machinery, there can be said to be some justification for this approach. The use of specialized operators to perform individual tasks is done in but a few factories.

Hand cutting knives

Hand shoemakers have almost none of the essential tooling; this is true of hand cutting knives. The knives now in use are sharpened with a hand file, but the best kinds of steel for these tools simply cannot be sharpened in this way. The ideal material is the same as for good-quality hack-saw blades; knives made from it are ground to shape and sharpened on stones or with abrasives. Turkish hack-saw blades have been tried for this purpose but were found to be too soft. The present knives quickly lose their edge so the cutter must constantly sharpen and flatten them. This represents a serious waste of time. Efforts should be made to obtain good-quality steel for this purpose. Cutting blades have been imported from the Federal Republic of Germany and from Italy, with very good results.

Skiving

Skiving has achieved high levels of performance as regards both quality and speed, and this fact can be attributed, to a large degree, to the fact that

the skiving machine has applications outside the shoe industry. Because of its widespread use, Turkey has now developed its own skiving machine; a good supply of spare parts and maintenance are available. On the other hand, there has been little or no development in the specialized aspects of skiving shoe upper parts. The guide used on the machine is really designed for leather work; this presents a serious drawback in obtaining skives at the correct angle and length. The skiving machine obtained from the shoe school in the Netherlands had all the types of guides used for shoemaking. It was possible to demonstrate the correct use of this machine, including the application of grooved skives for folding.

Marking

Marking is the simplest of operations and yet one which in few cases is done correctly. Either a ball-point pen or the back of a knife is used to make a scratch mark for the stitching lines to follow. The result is invariably a permanent mark or scratch, which ruins the appearance of the finished article. A special leather ball-point pen with removable silver ink is available for this operation but must be imported. Only a few people who have purchased these pens in Italy when visiting there have them. This point again emphasizes the need to have the supply of the latest equipment. The cost of these pens is equivalent to LT 7 each. An alternative to the leather ball-point pen is a lettering pen using a water-based pigment ink. These are available readily in Turkey, but this method has not yet been tried.

Folding

All folding is done entirely by hand in Turkey, even at the Beykoz-Summerbank plant. This is extremely difficult to understand, as folding machines are comparatively inexpensive, and the increased production would soon recover the capital costs. Making a direct comparison on the machine at LRTI, the rate of production, machine to hand, is of the order of 3 to 1. If a folding machine with cement application were used, there would be a further saving in labour and space.

In some instances complete workshops are devoted to hand folding, and the use of a machine would make such workshops very profitable indeed. One probable reason the folding machine has never been introduced may be that it is used only in the shoe industry. The folding machine at LRTI has made a great impression on all who have seen it being used not only for folded-edge work but also as a bagged edge. In many respects, the old type of folding machine is better suited to Turkey than newer ones. It could be advantageous to have old, rebuilt machines rather than new, modern ones.

Sewing machines

Almost without exception, the use of the flat-bed sewing machine is predominant; exceptions are the Beykoz-Summerbank plant and at Yeşil Kundera, where in both cases post machines are being used with great effect. The main reason for the predominance of the flat-bed machine lies in its cost. When post machines were first introduced to the shoe industry, only the more enlightened entrepreneurs took advantage of them because, generally speaking,

their cost is double that of flat-bed machines. The situation in Turkey is even more exaggerated owing to the import duty imposed. A basic flat-bed machine with a stand can be purchased in Turkey for LT 12,000, whereas a post machine without a stand will cost at least LT 18,000; with import duty, the final price will be almost double.

There seems to be a total lack of understanding of the specialized nature of sewing machines. There are something like 500 special classes alone applicable to the shoe trade, and at the present time Turkey only makes one model, and this is very dated in terms of speed and lubrication.

It is vital to the industry that post machines be adopted both to improve the quality of the work and the speed of production. The time taken for an experienced flat-bed machinist to adjust to a post machine is quite lengthy, owing to the change in handling movements. The ideal is to introduce these machines to young people who will learn rapidly and considerably increase production.

It should not be overlooked that the future of the leather shoe industry depends very much on the post sewing machine. If it is not introduced quickly, serious problems will arise both in the development of the industry and the competitiveness of the industry in Europe and throughout the world. Whereas, with the leather garment industry, the principal machine is a flat-bed machine, this is not the case in the shoe industry, and which largely explains why the garment industry has been so successful in exporting. One machinist can produce approximately eight garments in a day on one flat-bed machine, while several specialized machines are required for shoes.

Punching

Punching machines are desperately needed throughout the industry. During his field trips, the expert saw but one such machine, which was of Italian origin. Punching and gimping are normally done with a converted sewing machine; the punches are made entirely by hand in Istanbul. It is said that they are in very short supply, owing to the lack of skilled labour. Even mocassin-type shoes are all punched individually by hand. The staff of the Beykoz-Summerbank plant admitted that it was because they had no press tubes that there was no decorative punching on the uppers of their shoes. Again, this situation seems intolerable when it is considered that such tooling is relatively cheap. In some other plants, press tubes and dies had been imported from Italy.

Hand stitching

Hand stitching is done very effectively on the fronts of shoes; there are a number of variations. One popular method is the use of a type of mocassin seam; here the hand stitcher produces the seam with an awl and a needle while clamping the leather over his knee with a leather strap. Such work should be encouraged and developed, especially for mocassin seams, where this operation eliminates lasting and provides an attractive seamed appearance. The only requirement, as discussed in the section Problem areas (page 16) of the body of the present report is the introduction of the hinged last; the potential of these hand stitchers is very great.

These methods have been demonstrated and much interest has been shown. One simple method is to make the last in two sections, held together with a metal pin and joined by a simple hinge. The pin locks the two sections together when the last has been forced inside the shoe. This type of last was commonly used for California-process (slip-lasted) shoes.

There are a few instances where specialized stitches offer a service for a raised seam by machine on a price-per-pair basis. For the Italian-type seam, however, the stitch does not go through the leather, and the seam is a very effective design feature. In some cases, to account for the variation in lasting when the seam must be parallel around the edge of the shoe, the stitching is actually done after lasting, with great success. LRTI should carefully study all of these applications and methods and extend them to other regions in Turkey. These seams should be studied in relation to products and possible application. Given the right designs and materials, there is good export potential in this type of work.

Edge treatments

Virtually all types of edge treatment are done by hand on the flat-bed sewing machine. These must be stitched without any guide and then folded over by hand. Various methods are used, and the quality of the work and the skill of the workers are excellent. Seldom does one see a special machine for this purpose except, perhaps, in the slipper-making area, where there is room for some degree of specialization, but here too they are very limited.

Summary of the upper-making situation

This area will require considerable development in the immediate future.

Owing to financial limitations, the equipment available is usually only a flat-bed sewing machine and skiving machine; in many cases skiving is done in a specialized workshop.

Hand fitting is inaccurate and involves the excessive use of adhesives. This work would be done more effectively by machinery.

There is a severe limitation of space in the workshops.

Nearly all punching is done by hand or by using converted sewing machines. There is much waste of time and effort owing to a lack of press tubes.

All folding is done by hand even in the factory system.

Skilled hand sewers produce excellent work, which should be extended into mocassin work and other shoes.

There is a serious lack of specialized sewing machines, especially post machines. There should be immediate steps taken to ease tariffs on the import of such equipment.

Hand-marking is very crude and usually damages the upper by scratches or ball-point pen marks.

The labour force is almost entirely male. The introduction of female labour could well ease the shortage of skilled stitchers.

Lasting

The last is the mould on which the shoe is shaped. It is the principal item of tooling for standard-type footwear; without it, shoes just cannot be made. The last is the critical problem in Turkish shoemaking. It will require major and determined effort to introduce modern hinged lasts. LRTI now has 26 pairs of modern lasts (that is, lasts with hinges, peg-locating holes and bottom plates). Of these, 12 had been ordered by the expert's predecessor, and the other 14 pairs were brought from the United Kingdom by the expert himself. Fortunately, these lasts are almost identical in shape; indeed, the bottom patterns are identical, which means that LRTI can use all of them in machine lasting. In all but three or four factories, all lasting is done by hand.

Hinged lasts

Turkish lasts are excellent as regards style and fit, but standardization alone will have no real effect in improving present manufacturing techniques. What is required is a modern last with a locating-peg hole, a hinge and, preferably, a bottom plate. At this writing, the only hinged lasts produced in Turkey are made at the Beykoz-Summerbank plant, which produces 25 to 30 pairs/day for its own use. However, the directorate of the factory has expressed their willingness to help the industry, LRTI and the last makers in any way they can. Such co-operation could well provide the impetus that is needed for rapid progress.

As far as small last manufacturers are concerned, all that would be required would be the machine to cut the slots for the hinge, and the capital outlay for it should be small. The metal hinges could easily be made in Istanbul or elsewhere. Indeed, the Beykoz-Summerbank factory is making its own.

Shoe manufacturers are beginning to press for these lasts, having seen their possibilities at LRTI or in Europe. There is good evidence that this problem will be solved in the not-too-distant future. However, the problem is as much economic as technical. The hinged lasts produced at Beykoz-Summerbank cost LT 125/pair, while solid ones produced in Istanbul cost only LT 65/pair. Considering the high quality of European lasts, it might be advisable to import them; the additional cost could well be justified. Furthermore, work on the introduction of hinged lasts should be accompanied by work on heat setting and reduction of the time of the shoe on the last. In so doing, the shoe manufacturers could easily afford the higher cost of the hinged last.

Plastic lasts

Many have said that Turkey should manufacture plastic lasts. This is a mistaken view, since Turkey has an adequate supply of suitable wood. Wood is self-reproducing and far less costly than plastic. Given good drying kilns, wooden lasts are as good as plastic ones, and Turkey already has the techniques for making them. They are also lighter and easier to handle than plastic ones. It would be far better to improve existing methods than to create costly new ones.

The lasters

The lasters are the most highly skilled craftsmen in the industry. To a great extent, the present good state of Turkish shoemaking can be attributed to these artisans, who treat each shoe individually. Where there are imperfections in the stitching or cutting or even in the patterns, they adjust each upper carefully, ensuring that each pair reaches a high standard of workmanship. The lasters not only shape the upper but also prepare the soles and attach the heels before the finishing process. This system reflects an individualism and pride of work in keeping with Turkish traditions.

However, it is unfortunately true that, for all their skill and artistry, Turkish lasters follow a traditional method that must be changed. At LRTI, completely new principles are being taught. In the traditional method, when the upper is pulled forward on the last, the heel of the shoe is lifted well over the top of the last. This is called the "seats hoisted" method; its object is to stretch the upper to fit the shape of the last. The result is that, when the front of the shoe has been secured by pushing the heel part down over the last, considerable tensions and strains are imparted to the leather. When the last is removed, the proper "pitch" of the shoe has been lost and the back part, or heel section, leans forward. This is because of the return of the material, which is elastic, to its original shape.

Since the patterns are often cut to conform to this method of lasting, this loss of shape is sometimes considerable; it is almost impossible to put on such a shoe without a shoehorn. This fact, together with the brittleness of the stiffener material, means that the back of the shoe is quickly broken down. In Turkey, one often sees people walking about with the backs of their shoes beneath their heels.

The custom of removing the shoes for worship and before entering a dwelling makes the proper fit of the back of the shoe very important to the wearer, since he must put them off and on frequently. It is the making of the heel part of the shoe that is so difficult and which needs so much attention in the Turkish shoe manufacturing industry.

At LRTI it is taught that the pattern should fit the last, and that lasting should be done with a minimum of strain or distortion. Nevertheless, the desire to do pull lasting with the heels raised to various levels persists, with the result that there is no consistency in the strains imparted to the materials, and the end products vary widely. It is this concept of fitting the upper to the last accurately that is so difficult to get across to Turkish lasters. Their traditional method requires hard physical effort, but nevertheless it will take some time and patience to change from the old system to modern machine techniques.

Whatever system is used, the basic fitting of the upper over the last so that conforms to it and makes a good appearance requires considerable skill and a high degree of manual dexterity. This work is done by the laster himself; other processes such as application of the adhesive are performed by assistants. About 60 nails are placed around the edge about 5 mm from the edge of the insole. The lining is then cut away with a hand knife up to the nails. The adhesive is allowed to dry, and then the nails are hammered over with great force, thus compressing the leather, particularly at the toe and seat, where pleating occurs. This gives a good, flat bottom to the shoe, making it ready for the attachment of the sole. The nails are removed by an assistant.

The lasters work on a price-per-pair basis. The normal time to last a pair of shoes is considered to be about 45 minutes. In the United Kingdom, the time for flat-lasted work varies between three and four minutes per pair.

Traditionally, the laster cuts all of his components, thus taking time from the exercise of his primary skill. The present method is for the laster to draw the shape of the toe puffs, stiffeners etc. on to the material and then cut it by hand, with shears. This system is far too slow; with a good hand knife, the material could be cut through several thicknesses with a single drawing. However, this is an area in which direct cutting with a press knife would save both time and material; all that would be required would be a number of standard shapes to cover the range of shoes being made.

Lasting tools

The Turkish hand laster has a complete range of tools, but the basic ones are the pincers and the hand knife. Turkish lasting pincers differ from European ones mainly in that they have no locating peg hole for the last, so the laster holds the shoe in his lap at an angle, which makes curved pincers unnecessary. The knife is a long piece of steel that must be continuously sharpened and flattened with a file. The quality of the steel could be improved, but this is not yet possible. It is the use of the hand knife that requires so much effort and skill. This demanding work could be avoided if press cutting were adopted.

Components

The Industrial Development Bank is giving serious consideration to the development of the shoe component industry, and LRTI has been able to provide advice as to the types of materials best suited to the Turkish shoe industry. Quotations for complete plants to produce various materials and components have been submitted by various companies. The implementation of this plan would have a greatly beneficial effect on the Turkish shoemaking industry, which presently suffers from a lack of domestically produced ones and can obtain imported ones only with considerable difficulty.

Insoles

Modern lasting systems are based on joining the upper to the insole with an adhesive. Insoles are commonly of fibreboard, and the bond strength of the present type is considerably reduced by delamination. The ideal board for this purpose has a cellulose base. At least two shoe factories have solved the problem of this material by importing it from Italy and thus have a tremendous advantage over the others.

Moulding. Successful shoemaking, especially as regards ladies' fashion shoes, depends on the insole being moulded and fitted exactly to the shape of the last bottom. Many shoemakers mould the insole to the last entirely by hand. The time required to make and mould one pair of insoles is about ten minutes. This work is done entirely on the worker's knee and involves a considerable amount of hammering with the last resting on his thigh, which becomes thoroughly bruised and without feeling. The workers say that they suffer no ill effects, but such a system is clearly intolerable. Furthermore,

this situation requires careful study because of a recent development. There now appears to be a small supply of ready-moulded insoles, but how they are produced is not yet known. LRTI has a moulding machine, and the moulds are reasonably well suited to the lasts in use. Unfortunately owing to the inability to appoint a full-time counterpart to the expert, moulds for new lasts are not being made. The possibility of making glass-fibre moulds has been raised, and it might be useful to pursue this line of investigation at a later time.

Cutting. The present method of cutting insoles is unacceptable on the grounds of accuracy, speed, wastage of materials and damage to the lasts. Insoles are now cut roughly from a sheet of fibreboard and attached to the last. With his hand knife, the laster cuts around the last so that the insole will conform to the shape of the last bottom. Even given the high degree of skill of the laster accuracy and consistency are just unattainable by this method. In the waist area of the shoe, the knife cuts into the last as the laster follows its last with his eyes.

This is unquestionably bad practice, but it is now the only method available. If suitable steel were provided to make hand cutting knives, the insoles could be cut to shape directly from the fibreboard sheet, making it unnecessary to cut on the last. This method has been demonstrated at LRTI, and a way to make suitable knives has also been shown. However, insoles should be cut directly from the sheet with a press knife. This would not be expensive if the cold-bend steel needed were readily available. Forged steel knives are used in some workshops, but their cost prevents their wider use. Where they are available, they should be used for mass-production by multi-thickness cutting.

Comparisons have been made at LRTI of the cutting of insoles to shape directly as opposed to the present system outlined above. It was found that the wastage per pair averaged between LT 0.50 and LT 1.00. When it is considered that Turkey's shoe production is about 29 million pairs/year, the scale of possible savings is very impressive.

The funds that could be saved by proper cutting could equip a sizeable number of shoe factories with modern machinery. In its courses, LRTI has shown how a good hydraulic press could pay for itself in a matter of months, even in small-scale operations. Apart from the savings in materials, there would be a saving of the input of skilled labour of about 30 seconds/pair, which would bring about a gradual reduction in the time required to make shoes. Unfortunately, many of the smaller shoe manufacturers appear oblivious to the importance of reducing wastage of materials. This matter needs concentrated effort by both LRTI and the Footwear Manufacturers' Federation.

Toe puffs and stiffeners

The toe puff is the component that strengthens and supports the toe of the shoe; the stiffener does the same for the heel. In Turkey, the standard material for these components is a thermosetting substance that was introduced in the 1940s. Before that time, leather was probably used. This fabric is impregnated with formaldehyde resins (urea, melamine or phenol) and hardened by curing with ammonium chloride, applied by dipping or painting.

This material has many disadvantages as regards machine lasting, but for the hand shoemaker its advantages outweigh other considerations. For example, it is so thin that it is needless to skive it. While it has been reported that this material has a pronounced tendency to induce contact dermatitis, no cases of this have so far been encountered. It may be that the skilful manner in which the laster handles it, using only his fingertips, is the explanation.

In a few instances a fibreboard somewhat lighter than the insole material is used as a stiffening material and is hand skived. This is done at the Beykoz-Summerbank factory without any pre-shaping or moulding. This leads to baggy top lines, full linings with many creases and very badly lasted seats. Since the fibreboard is not pre-moulded, the patterns must be cut to make the best of an impossible situation. When this method is changed, as it must be, every press knife in the factory will have to be altered to yield the correct back curve.

Shaping. The shapes of these components are modified by the laster to improve shape retention in the upper. Unfortunately, this is all too often done at the expense of the comfort of the wearer, especially as regards the toe puff. The tendency is to extend the toe puff too far forward towards the joint (that is, where the foot bends); during flexing, the hard line of the toe puff digs into the foot, causing severe discomfort. The material is very strong in relation to its weight, but it makes a very hard edge; this line can be seen very easily if there is any "fall-in" of the upper after lasting. This has been found to be a problem on lasting machines even when all tension has been removed from the pincers. It is to be hoped that heat setting will solve it. It should be noted that only a few shoe styles require very hard toe puffs and that in ladies' fashion shoes they are not used at all.

Another problem with this material is that it tends to adhere to the last unless great pains are taken to avoid it by using white chalk or layers of paper. It is not uncommon to look into a Turkish shoe and find large pieces of paper stuck to its inside. When using chalk, great care must be taken to avoid getting it in the lasting margin and thus preventing the formation of an adhesive bond.

Where fabric rather than fibreboard is used for stiffener material, the sticking problem is not so great because the lining material is thicker. Good seats can be made with this material since it readily assumes the shape of the heel without pre-moulding. Its great disadvantage is that it is rather brittle; breakdown of the seat easily occurs after a short period of wear.

The two manufacturers who have been able to import components have also successfully introduced thermoplastic toe-puffs and are using them exclusively. This material comes from Italy in sheets and is pre-coated with a thermoplastic adhesive. The toe-puffs are cut to shape, skived, and then attached to the upper under a heated press. LRTI should try to make this material more generally available to the industry by solving the importation problem.

New materials are also required for stiffeners as well as better means of moulding fibreboard to make them. In the two quality factories, some moulding is done with a roller machine. Special attention is given to

perfecting the machine-skived edge by additional hand skiving. However, the number of operations involved in making the seat of the shoe is quite considerable, and this is largely due to the nature of the stiffener material itself.

Consideration was given to the use of other materials, and at the moment there appears to be a strong case for using more-advanced solvent-activated ones. They would have to be imported, although, as with toe puffs, quotations for plants to manufacture them have been submitted.

Shanks

The subject of shanks was dealt with extensively by a previous expert. It is probably a result of his reports that steel ones have been introduced into Turkish shoe manufacture and are now being made in Istanbul. In most cases the quality of the steel used appears to be good, but they are invariably too short, thus providing little support from the heel to the joint of the shoe. As the previous expert pointed out in his reports, shoes tend to gape badly when there is insufficient support at the waist. The shank must extend beyond the front of the heel; most of those being used are too short for this.

Completion of the shoe

Making

This term refers to the way in which the soles are attached to the uppers. For leather soles, the main process in use is known as the machine-sewn or Littleway lock-stitch process, according to whether the sole is attached with a chain-stitch or a lock-stitch, using either linen or synthetic thread. The soles have a channel into which the stitching is done.

Before stitching, the laster cuts and prepares the soles and attaches them temporarily to the shoe bottoms. The last must then be removed before the stitching can be done, since the stitches go right through the sole, insole and upper. This means that the last must be removed and inserted at least once, and this is quite arduous with lasts that are not hinged.

Bottom filling

At present, bottom filling is done in only one or two factories. However, if the Turkish industry is to become competitive on the international market, it must be done generally. Here again, this will depend on the ability to import materials of the highest quality.

Leather sole cutting

In Turkey, leather soles are cut in three different ways: a few with the press knife, many with the hand knife, and some with a small rotary wheel knife that has an attachment for sticking down the channel after stitching. In general, the wastage of sole leather is considerable; according to the calculations of LRTI, it amounts to at least 20%. According to the most recent figures, the annual production of sole leather is 2.5 million kg, at a cost of LT 70/kg, for a total of LT 175 million. There is thus a loss on the order of about LT 35 million annually.

The roughly cut sole is attached with a hammer and nails and then trimmed to shape with a hand knife; the channel is then cut by hand and turned back with a screwdriver. A small cutting tool is then used to cut a groove for the row of stitches. A channelling machine is not used for this purpose. Even in the hand shoemaking section of the Beykoz-Summerbank plant this difficult task is done by hand although machines are available. Such machines are quite inexpensive and should be introduced and used more widely. The last is re-inserted in the shoe and the channel is coated with adhesive and then closed, either by hand or with the channel-closing attachment to the rotary wheel knife.

Sole stitching

The Turkish shoe industry is proficient in sole stitching, both by hand and by machine. Machines have been in use for decades, and there seems to have been no difficulty in introducing new types. There is apparently no problem in this area; the stitching workshops offer very efficient service to shoemakers. The Footwear Federation reports that there are probably about 150 such workshops in Istanbul alone that have both lock-stitch and outsole machines. The capacity of such a workshop is normally about 800 pairs/10 hours, although the actual production requirement is normally only about 500 pairs/day. For outsole stitching, a capacity of 700 pairs/day is quoted.

Throughout all workshops there is a problem of seasonal fluctuation of demand. As regards stitching, LRTI has been informed that in winter a production rate of 600 pairs/day is maintained, while during the summer only 100 pairs/day are produced.

The cost per pair for stitching is as follows: LT 2.25 for Blake-sewn work, LT 3.50 for polyurethane and LT 3.50 for outsole stitching. These figures include the costs of thread, randing etc.

The stitching workshops have the same problems as the rest of the industry as regards spare parts and needles, the prices of which range between LT 3 and LT 5. Spare parts are copied whenever possible and made locally; when this is too difficult or costly, the problems of making contacts abroad and arranging imports must be faced.

An exception to the usual difficulty with imports is thread. Nevertheless, it appears that the industry has stagnated rather than attempt to keep abreast of modern developments in materials. All of the local shops display vast quantities of imported thread; it would seem that if the shoe manufacturing industry were to make a concerted effort, as one or two have done, some other urgently required materials would be made available. Both imported and domestically produced threads are available. Imported linen thread is quoted at LT 250/kg, while a domestic thread of linen and synthetic fibre is available for only LT 85/kg. This is an instance in which a ban on imports might be justifiable; the fact that military boots contain a high proportion of imported threads may explain their availability.

Heels and their attachment

Wooden heels are standard in Turkey. Built-up leather ones are no longer seen because of their excessive labour cost. Wooden heels are made very well,

but variations in the wood make good finishing very difficult, and they are just not good enough for an export market. LRTI could possibly make a study of the possibility of making compressed fibreboard heels with leather lifts. This would involve a study of the machinery involved, which would have to be imported. An alternative is the development of plastic heels. Turkey has the necessary technology for making them, but the only problem would be the high cost of making the moulds for mass production, for which the industry is not yet sufficiently developed.

The heel-making machinery is already Turkish made, based on wood-turning machines, which again indicates how the development of other industries has been applied to the shoe industry with good effect. Where the demand is solely for shoe machinery, the economics make development quite impossible.

The heel part of the sole is roughed and cemented and the heel also coated with adhesive. The heel is then hammered on, and then four large nails are driven through it into the last. The top piece is then stuck on and nailed in position. The shoes are now ready for finishing. Sometimes, after finishing, nails are also driven in by hand from the inside for added security. The whole matter of heel attachment requires much attention throughout the industry.

Finishing is nearly always done by specialist workshops that operate on a price-per-pair basis. An average cost is LT 5/pair, inclusive of all materials, inks etc. This stage represents an area of great weakness in Turkish shoemaking, but this cannot be attributed to any lack of skill of the workers but to a combination of factors such as limited equipment and poor heels and finishes. Export standard has been achieved by only the two quality shoe factories; both of them use finishes imported from Italy. These finishes completely upgrade the quality of the leather shoe. Outside of these two factories, a good bottom finish for leather soles is virtually non-existent. It is no wonder that there is an insatiable demand for the output of these two factories on the domestic market, so they do not have to cope with the problems of exporting.

The development of finishes is an important area of work on which LRTI should concentrate. Once developed, these finishes could be made in Turkey, provided that marketing and demand made this worth while. There have been discussions with a large finish manufacturer (Dyo), and there is already some movement in this direction.

The socks are stamped by specialists who have either developed their own simple hot-foil presses or have acquired standard ones. The metal dies for stamping cost as little as LT 30 each, and a machine costs no more than about LT 1,000. The quality of the stamping is not good enough for export since the pressure, dwell and temperature are not controlled adequately. Simple improvements to the machine would yield good results quickly.

The shoe is hand polished and the last is finally removed. The large nails used for attaching the heels are turned over and flattened down. This is a major fault with the shoes, since it is often not possible to turn these nails down adequately, and they present a large raised effect inside the heel, where it is seen most. To offset this fault, some place a piece of foam underneath the sock to prevent the nails from showing through.

Strategies for modernizing Turkish shoemaking

After having remained stagnant for so many years, Turkey's shoe manufacturing industry is struggling to survive. Some other Turkish industries are developing well, but in shoe manufacture the work-force is declining, and there is no compensatory capital investment. The industry must, at all levels - the small workshops, the fashion factories and the mass-production plants - be given access to the right materials, components, machinery and equipment. Such help can come only from the Government. The industry also needs strong and dynamic leadership; it is incumbent upon LRTI to provide it.

The present government plan for the shoe manufacturing industry calls for more mechanized factories, operated on a production-line basis. There is an undoubted need for them, but it must be clearly understood at all levels that such new factories will require a completely non-traditional approach. As regards their staffing, the most effective method would be to train a completely new labour force with no prior knowledge of the industry; the traditional methods and attitudes of the present workforce would take long to change. LRTI should advise on this, and courses should be offered on training, management and costing.

On the other hand, the greatest asset of Turkey's present shoe manufacturing industry is its supply of skilled craftsmen. The problem here is how to organize into an efficient industry that would be capable of meeting international competition. The main task of LRTI and of the Government should be to mobilize this great pool of skills and put them to effective use.

It is always noticeable that no shortcuts are ever taken that would lower the quality of the shoe, such as reducing the number of nails or the amount of hammering. The same care and attention is given to each pair that is produced. Here one can see the important element of job satisfaction and pride in workmanship that is possible when working in small groups and completing an entire task. In Europe this principle has begun to be understood only recently. It is of interest that the group working system is being extended into some of the factories. It has had particular success in the making of ladies' high-fashion shoes, where craftsmanship is especially important. Incidentally, it is precisely this area of work which the shoe industry should encourage, first because quality leather shoes will have the greatest export potential, and second, because the movement of the skilled craftsmen to more organized systems, such as small factories and co-operatives, would be less likely to cause the loss of these artisans and their skills than would the assembly-line system.

Under the present small-workshop system, which predominates today, the workers have a great deal of freedom. Consequently, they are reluctant to join together to form small factories or co-operatives. However, owing to the increasing economic pressure for increased efficiency and improved quality, the creation of larger producing units is essential if the small shoemakers are to survive. The guidance of these small units should be the first priority of LRTI. The principal impediment here is the difficulty in finding a person capable of providing both the technical guidance and with the required patience and qualities of leadership that would be required to bring this about. The aim should be to enable the present ateliers to increase their output from 100 to 150 pairs/week to 150 to 200 pairs/day, with approximately the same labour force.

A basic difficulty with this strategy is that most modern shoe machinery is of the high-capital, low-labour type, which is suitable only for high-production situations. However, a British shoe machinery manufacturer has introduced a line of machines that are relatively inexpensive and, in the case of the lasting machinery, operates entirely without mechanical or electrical power. With some modifications, this concept would seem to be ideally suited to the Turkish industry.

At the end of his assignment, the expert and some Turkish shoe manufacturers visited the United Kingdom to inspect these machines, and an agreement was reached to market them in Turkey. There was also an agreement to purchase more advanced machinery and set up some shoe factories of the modern type, but for the small atelier system, the ideal way would be for them to grow naturally with the introduction of such new machinery, which would be immediately profitable and would cause less social disruption. The machinery required for a small shoe factory with an output of between 200 and 500 pairs/day is shown in table 3. This listing can be used quite flexibly; some of the machines

Table 3. Machinery for a shoe factory with an output of 200-500 pairs/day^{a/}

Items	Costs (Turkish lire)
1 Hydraulic cutting press	30 000
1 Skiving machine	12 000
1 Folding machine	54 000
4 Flat-bed sewing machines (LT 12 000 each)	48 000
2 Post sewing machines (LT 21 500 each)	43 000
1 Unpowered lasting machine (including hot-melt applicator)	54 000
1 Roughing and scouring machine	16 000
1 Sole-attaching press	11 475
1 Activating heater	2 673
1 Channelling machine	40 000
1 Lock-stitch sole stitcher	54 000
1 Hand (unpowered) heel-attaching machine	5 886
1 Combined finishing machine	28 674
1 Humid heat setter	<u>73 710</u>
Total	473 418 ^{b/}

^{a/} Only the skiving machine and the flat-bed sewing machines are obtainable in Turkey.

^{b/} Not including import duties.

in it could be made self supporting by farming out their excess capacity; for example, a folding machine could subcontract work, and the sewing machinery could take on additional work. The ideal situation, however, would be to eliminate from this list machinery such as the sole stitcher and finishing machinery by using existing workshops that specialize in such work. If such specialist shops could be brought together into a co-operative arrangement, the capital saved could be invested more profitably in other kinds of machinery.

The formation of co-operatives in this manner would appear to be very advantageous, considering the great savings that could be made in the acquisition of machinery and the fact that, if 25% of the required capital is raised, the interest on the amount borrowed would be only 3.5%. The purpose of such a co-operative would be to pool the diverse skills of its members into one efficient unit that could be enlarged as progress is made.

The lasting machinery in the list (table 2) is very basic, including 1 unpowered toe-and-heel laster capable of producing 200 pairs/day. Assembly could still be done by hand, although there is an unpowered machine to perform this operation. Most modern lasting machines can produce up to 1,000 pairs/day, which would be far too great for the type of operation envisaged here, and the capital cost for one would be about half of the total cost of the machinery listed in the table. Machinery of this kind could be used to produce mocassins and shoes with Littleway lock-stitch leather soles and with stuck-on soles.

Labour and labour costs

The Turkish minimum wage for factory workers is LT 1,800 monthly for a 26-day working month that includes Saturdays. A skilled shoe worker starts between LT 2,000 and LT 2,500 monthly, while a skilled worker with 10 to 15 years of service earns LT 3,000 monthly. Figure II is a bar graph of the labour costs in United States cents (¢) per minute in seven different countries in 1975. Inspection of this figure gives a very clear picture of the comparative cost of Turkish labour. It can be seen that, at that time, a skilled worker earned the equivalent of 1.66 ¢/min and an unskilled one 0.64 ¢/min. Since the graph was prepared on the basis of skilled earnings, the figure of 1.6 ¢/min is the more accurate. The same source also states that to produce, by hand, a straightforward leather-upper shoe with a stuck-on sole unit, efficiently made, would take 13.2 standard minutes. The cost is given as \$0.90, and overheads would double this figure to \$1.80. There are no comparable figures for factory production, but since in Turkey there is only one plant (Beykoz-Summerbank) with comparable lasting machinery that produces a similar type of shoe, there is perhaps little relevance.

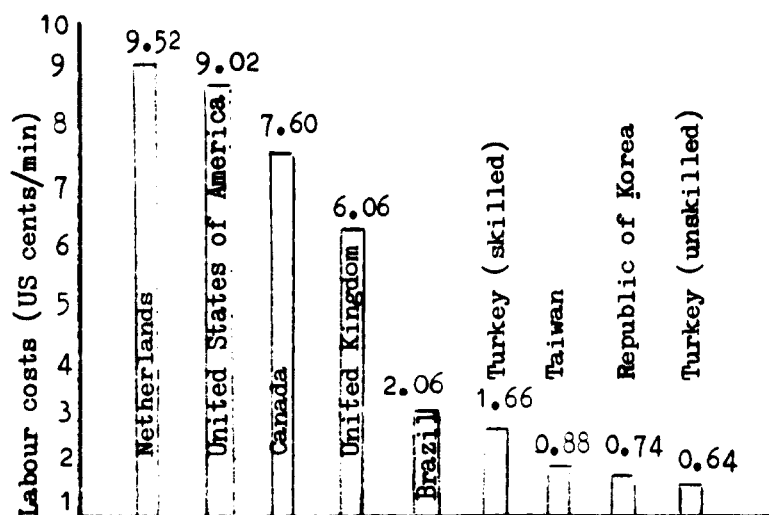
As regards hand shoemaking, the costs per pair in Turkey are roughly as follows:

	<u>LT</u>
Hand cutting	3
Upper making	12
Lasting	<u>15</u>
Total	30

These figures can be regarded as fairly representative. The lasting costs have been estimated on the basis that the total making costs are usually of the order of LT 25 to LT 28/pair, although much higher figures do exist, and the other operations would not be necessary for a stuck-on, unit-soled shoe. The upper-making cost shown here is based on a fairly straightforward shoe and would be considerably higher for a complicated upper. Based on the exchange rate of approximately LT 15 = \$1, it can be seen from figure II that, in small-scale shoemaking, direct labour costs in Turkey are greater than those of the United Kingdom. However, when overheads are added, the balance is only slightly in favour of Turkey, where small shoemakers have very small overhead costs; indeed, some pay for their own insurance out of their wages.

To make a direct comparison of labour costs in the lasting process, comparing British standard costs for men's flat-lasted shoes, the total cost per pair, inclusive of the employer's state welfare contributions and holiday pay, for an average British lasting system is about 11 pence/pair, which in Turkish money would be about LT 3/pair. This example gives some idea of the savings that a standard lasting system would make possible for small Turkish shoemakers: namely, about LT 12/pair. It is true, however, that such a system is based on high productivity.

Figure II. Labour costs (in United States cents/min) in selected countries



Source: British Boot and Shoe Institution Journal, May-June 1976.

Serious consideration should be given to the vulcanized, force-lasted shoe. In this type of factory, with the given labour force, and basing the earnings of a medium-skilled worker at LT 2,000 to LT 2,500/month, the labour cost per pair would be between \$0.53 and \$0.66/pair (see figure II). These figures must be approximately accurate, and it can be seen how competitive this type of shoemaking is, in terms of labour costs, with the European flat-lasted shoe.

One of the reasons for the development of this type of factory shoemaking is its ability to compete with small shoemakers with low overheads. At present, the larger manufacturer must carry the burden of large social insurance contributions. For example, if the labour cost for a pair of shoes is LT 10, to which must be added 80% for social insurance, costs become quite high. There would thus appear to be a strong case for the Government to study the matter of further incentives for large shoe manufacturers.

Good management and organization can reduce labour costs as much as one third as compared with hand shoemaking. This has been done in one case by building a small factory that specializes in one kind of shoe. However, it should be noted that in this case the new shoemaking factory was part of a wider organization that had diversified with a wide variety of products.

Given reasonably good machinery, shoemaking costs could easily be reduced over a period by at least 50%. Organization, rather than technical know-how, is the critical factor; this point was stressed continually in the two main instances concerning factories that produced quality footwear. In both of these cases there was an actual drop in production during the initial stages of mechanization. This fall-off probably resulted from efforts to organize the work flow and maintain quality.

Except in perhaps only two of the larger factories, where they are being used very effectively, female workers are almost never seen in the industry; tradition appears to be against it. They could be a valuable source of labour for a revitalized industry.

If the industry is modernized so as to reduce the unit labour input, a serious redundancy problem will arise, especially among the lasters. Action should be taken to minimize the resultant hardship to both the individuals and to the industry. This potential problem is perhaps best visualized by looking at the staffing of a fairly large (by Turkish standards) factory at which lasting is done entirely by hand. The number of operatives was as follows:

<u>Task</u>	<u>Workers</u>
Upper cutting	10
Closing	35
Lasting	40
Scouring	10
Finishing	10
Sole cutting	<u>5</u>
Total	110

The lasters are thus about one third of the labour force; with modern lasting machinery, three out of four of them would become redundant. Based on an average monthly salary of LT 2,000, present lasting costs are about LT 30,000/month, so a 75% saving would amount to LT 60,000/month. However, with machine lasting, there would be insufficient labour in the upper-making department. Consequently, it would be wise to reduce the number of assistants in lasting as machinery is introduced and re-train them in upper making. Unless the problem of redundancy is given timely attention, there could be a grave danger of losing an important part of the shoemaking labour force.

Costs of materials

Turkish shoemakers complain that the materials that they must use are not only inconsistent in quality but very high in price. One prominent manufacturer has expressed the view that the entry of Turkey into the European Economic Community would be very advantageous to the industry because it would provide access to a wide range of quality materials at costs below present levels. This point about the cost and availability of adequate materials has been raised several times in the present report. In the case of force-lasted vulcanized shoes, where labour costs are very competitive, the effect would be far reaching.

The present cost of making a typical men's shoe with present materials is broken down in table 4. Inspection of this table reveals that the cost of such a shoe would range from LT 104.50 to LT 80, depending on the type of sole. Not mentioned are polyurethane unit soles, which have become quite popular. However, their prices in Turkey are double those quoted in the Federal Republic of Germany; there would appear to be some exploitation of the shoemaker in this case.

Table 4. Cost (LT) breakdown of a typical men's shoe

Shoe (without sole)	
Outside leather (2 ft ² at LT 20/ft ²)	40.00
Lining leather (1 ft ² at LT 12/ft ²)	12.00
Vamp lining fabric	0.65
Threads and adhesives	1.00
Toe puff	0.55
Stiffener	0.80
Insole board	2.50
Shank	1.00
Adhesive (estimated)	5.00
Sock	<u>2.00</u>
Total	65.50

Various sole units

Leather unit (built up)

Leather sole	30.00
Wooden heel	4.00
Top piece	3.00
Finishes	<u>2.00</u>
Total	39.00

Vulcanized rubber unit

Complete moulded sole and heel unit	9.00
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Microcellular rubber soling

9-mm material:	
Sole	9.50
Heel	<u>7.00</u>
Total	16.50

6-mm material:	
Sole and heel	14.50

Marketing

In Turkey, shoe marketing is based on large wholesale warehouses in the principal cities, notably Istanbul and Izmir. These are large buildings in which there are literally scores of small wholesale shops to which people from all over the country come to buy their shoes. Marketing seems to be done on the basis of more or less long-term understandings. Small producers (25 to 35 pairs/day) supply the local retailers directly, while larger producers (100 to 120 pairs/day) may have their own wholesale shops all over Turkey. In Izmir, some manufacturers have agreements with wholesalers in Istanbul, who pass along to them orders for given amounts of selected styles.

The key figure in the trade appears to be the wholesaler, who helps the small workshop to purchase its materials and in some cases provides them on credit. If this is the case, either some small producers are never able to stand on their own feet or they prefer this system because they do not have to commit all of their own capital.

In Izmir, the market appears to be reasonably transparent, with competition levelling prices at all stages. Everyone knows everyone else, and business is transacted on the basis of acquaintance, friendship and mutual trust. This implies that the margins at each stage are relatively fixed.

It is suggested that there is an increase of about 15% between factory and wholesale prices and of about 50% between factory and retail prices. One type of shoe priced at LT 170 ex factory was said to retail for LT 215 (+ 25%), but this case probably is that of a producer with his own retail shop. In Istanbul, increases of up to 100% are quoted. The findings of a government study of shoe pricing are given in table 5. The Project Manager has strongly recommended that the present marketing system be investigated, since it may be a hindrance to the general growth of the shoemaking industry. On the other hand, one shoe manufacturer with whom the problem was discussed considered the present system satisfactory. Nevertheless, it is significant that, aside from the Beykoz-Summerbank factory and the production of military footwear, Turkish shoemaking has no really large-scale production and distribution. In this connection, it is of interest that a new shoemaking company that is planning to build a new factory at Izmir plans to divide Turkey into seven areas, each to be covered by a man who will assess the type and volume of demand in it. The intention is to produce for a known market. The resident economist of LRTI should make a full and careful study to determine whether there is a problem here and, if there is one, to make recommendations for the future.

Table 5. Shoe prices (LT) in 1975 and 1976

Shoe types	Producers' prices		Wholesale prices		Retail prices	
	1975	1976	1975	1976	1975	1976
Leather:						
Men's	150	180	172	207	232	280
Women's	160	190	184	218	248	295
Children's	90	100	103	115	140	155
Rubber and plastic	80	90	92	103	125	150
Textile	45	50	52	57	70	77

These classifications are general; no consideration is given to quality. A rough guide is as follows:

The relation of quality to shoe prices

	Low	Medium	High
Men's shoes	200	201-250	250 and up
Women's shoes	250	251-350	351 and up

Source: Government of Turkey.

Importance of the shoemaking industry

Throughout the shoemaking industry there is deep concern that the Government appears to be indifferent to its needs and unaware of its importance to the national economy, especially as regards employment. Although the Project Document states that a total of 80,000 people are employed in shoe manufacture, the latest Five Year Plan of the Government clearly shows more than double this number, with 150,000 in the small workshops alone.

Figures on the number of small shoe workshops in Turkey are very inconsistent. According to the Five Year Plan there are about 30,000 of them, distributed all over the country. The 150,000 people said to be employed in them produce 29 million pairs yearly. Based on 200 working days per year, this total would indicate an output of less than one pair per worker per day, which seems very low. According to the calculations of LRTI, based on a labour cost of LT 35 to LT 60/day, the production figure per worker should be on the order of 2 pairs/day.

These figures indicate the importance of the small shoemaking units to employment and to the economy in general. The economist of the project has stated that "the estimated total of 30 million pairs of leather shoes for workshop production is likely to be a conservative estimate, and in fact cannot account for the production of upper leather estimated in the tanning industry."

The government sector of the industry employs 2,300 people, but of these only 1,100 actually make shoes, of which they produce about 50,000 pairs/week. (This total includes fabric and plastic shoes, which account for 2.5 million pairs/year.) On the basis of a 5.5-day work-week, this represents an output of 8 pairs/day per operative. Fifteen large-scale factories employ 2,000 workers and produce 4.5 million pairs/year. The present condition of this sector is presented in table 2.

The Government reports that the total cost of material used in the shoe industry as being LT 4,815.7 million annually, all of which is supposed to be produced within Turkey. However, the records of LRTI show that at least two manufacturers import modern components for their entire production.

Exports

In 1974, Turkey's shoe exports were 150,000 pairs, valued at \$2 million; in 1975, these totals rose to 270,000 pairs, valued at \$3 million. The export potential of the shoe industry could equal that of the leather garment industry, but the present dearth of materials and equipment do not permit it. Even under the present circumstances, the extent of the interrelation of the allied industries is important, economically; their development is vital to the shoe industry, which uses a vast range of materials. As regards leather alone, the broad requirements for footwear of various types is considerable; and the tanning industry requires a prosperous shoe industry as a customer if it is to develop fully. Indeed, the economist quoted above, in his report on the Turkish leather industry, found that the demand for leather will soon exceed the domestic supply if it has not already done so; it already imports 15% to 20% of the raw hides it uses.

One source of leather that is in oversupply is goatskins; the large goat population throughout the country presents an important opportunity to the shoe industry. Goatskins are an excellent material for making uppers, but techniques for making the linings, backers and other shoe components to use with them have yet to be developed. A shoe of this type, with a leather sole, would have very good prospects on the export market.

General summary

The principal bottleneck in production is lasting, so modern lasts must be introduced. Given the conditions under which it must operate and considering the restrictions imposed upon it, it is remarkable that a Turkish shoe manufacturing industry exists. As it is, all evidence indicates that there is a general decline as the small workshops close their doors. The only new factory that is in production makes military footwear, and such operations have no effect whatever on the industry at large, since their methods of construction are unique. Throughout the industry there is considerable wastage of materials and a general unawareness of how to cost.

Because it is a government factory, the Beykoz-Summerbank shoe plant can import any materials or equipment duty free. Nevertheless, it gives no lead to the industry; in most respects, its methods, machines and the quality of its output are very poor. Only straightforward designs are made, so it has no staff competent in producing patterns and designs and that would be able to provide the good nucleus of trained pattern staff that is essential to a dynamic shoe industry.

Several shoe factories are being built, and machinery for them has been ordered. It is vital to the Turkish shoe manufacturing industry that these new factories succeed. However, it must be clearly understood that, without an awareness of the problems that they will face, in terms of technical assistance, regularity of supply and quality of materials and the availability of components, it seems very questionable that they will be viable. If the further great problem of marketing is added to the others, which must be solved if a modern shoe factory is ever to be established in Turkey, it is evident that all possible assistance must be rendered by both the Government and LRTI.

Recommendations

The Turkish shoe manufacturing industry has many shortcomings that must be overcome if it is to prosper. The following 18 recommendations for improving the situation have been grouped into five rough categories.

Technical

1. Two types of lasts must be developed: a hinged one suitable for conventional shoes and one that shortens, for use in force-lasting.
2. Consideration should be given to the production of shoes of the veld-schoen type.
3. The industry should set up an investigation of the long-term development of shoe machinery and establish the areas in which such effort would be most worth while. Some examples would be mould-making and press-cutting. The Marmara Scientific Research Centre should provide advice through LRTI.
4. Effort must be concentrated in the making of leather uppers, using modern machinery. Marking, specialized sewing, punching and folding are all in urgent need of development. The use of excessive amounts of adhesive and of fitting must be eliminated.
5. The development of the production of high-grade goatskin shoes for export must be encouraged.

6. The component industry must be developed in co-operation with LRTI.

Economic

7. There should be a full investigation of the market and financing of stocks of materials.
8. In co-operation with LRTI, the industry should mount an intensive campaign on the economic use and costing of materials.
9. The industry should make use of female labour and develop a system of industrial homework, thus utilizing the great capabilities of Turkey in hand sewing.

Governmental

10. Import duties should be reduced on items that would bring about improved product quality and reduce production costs, thus permitting shoe manufacturing and allied industries to become more profitable and capable of expansion. Of particular importance in this respect are: press-knife steel, post sewing machines, toe-puff and stiffener materials, insole materials, finishes, press-cutting tubes, last-making machinery and upper-making machinery.
11. The military authorities should investigate their specific requirements for footwear and carefully compare their findings with the type of military shoe construction that is now practised.

Organizational

12. The small workshops must organize themselves into larger and more efficient units and take advantage of the facilities of LRTI to assist their development.
13. A detailed study of the value of the group working system should be undertaken in relation to job satisfaction, achievement of quality and economy, and how established practices can be modified to become more effective and thus lead to improved working conditions.
14. Encourage the small shoemakers to use the equipment at LRTI to develop lasting methods and upper-making techniques.

Educational

15. The larger manufacturing units should each recruit and sponsor at least one student of good academic standard for full-time study at LRTI.
16. The industry should seek out suitable candidates for United Nations fellowships. Ideally, they should be persons with training and experience in the Turkish industry or among Turkish nationals working in the industry abroad.
17. The industry should encourage co-operation between the fashion centres in Istanbul and Ankara and LRTI to train designers for the future and to stimulate aesthetic appreciation in the students who attend the full-time course.
18. The industry should take advantage of the pattern facilities of LRTI to develop better patterns. Such services should be developed throughout the major shoemaking centres.

Annex III

MACHINERY AND EQUIPMENT IN THE FOOTWEAR DEPARTMENT

<u>Machine</u>	<u>Source</u>	<u>Comment</u>
Atom Press No. S.F. 47 ^{a/}	Tuttoscarpa (Italy)	Operational. Produces very good results but pressure is too low for larger press knives. There is a very good cutting pad, and spares are available. Tables for press knives and work are needed. These have been designed but not produced.
Conditioning unit for pull lasting No. S.F. 50 ^{a/}	Tuttoscarpa (Italy)	The steaming part is not powerful enough; a stronger heating element is required.
Lince grading machine No. S.F. 49 ^{a/}	Tuttoscarpa (Italy)	Operational. The punches were picked up and paid for by the United Nations economist. A new spare bottom die should be ordered.
Insole moulding machine BANF P 64 No. S.F. 52 ^{a/ b/}	Tuttoscarpa (Italy)	Operational. The moulds function and provide a reasonable fit for the lasts. Work is required for new moulds.
Spray booth No. S.F. 48 ^{a/}	Tuttoscarpa (Italy)	Operational. A larger spray gun for final spray dressing should be ordered.
Improved pattern shears Model R No. E 151	British United Shoe Machinery Co. Ltd (HUSM) (United Kingdom)	Operational. One cutting knife is broken, and the spare has been used. Two others should be ordered.
Pattern-binding and corner-cutting machine No. G2291	HUSM	Operational. Spare parts unused.
Pattern-strip forming machine No. 299	HUSM	Operational. A new wheel is required to replace the used spare.
No. 1 pattern eyeletting machine No. 6008	HUSM	Operational. No pattern eyelets have yet been found for this machine.

<u>Machine</u>	<u>Source</u>	<u>Comment</u>
Pulling and lasting machine model 4 A	BUSM	Operational. Spare parts unused. New plates for other last shapes should be considered. Supply of hot-melt cement almost exhausted; further supplies should be ordered.
Heel-set laster No. 5, Series 2	BUSM	Operational. Spare parts unused. There is an adequate supply of tacks, but a facility is required to reorder them.
No. 2 upper-roughing and scouring machine	BUSM	Operational. Spare parts unused. The supply of roughing brushes should be checked to determine whether they fit the machine and if more will be needed. There is an adequate supply of abrasive bands, but a facility to reorder them is required.
No. 7 heel-scouring machine model 368	BUSM	Operational. Spare parts unused. There is a good stock of abrasive cloths, and supplies are available in Istanbul.
Folding machine model S.F. 10	Albeko (Federal Republic of Germany)	Operational. Manual has been obtained. In good working order, but no spare parts are available.
Eyeletting machine	Albeko (Federal Republic of Germany)	Non-operational; requires attention to feed and raceway. There are no spare parts nor any servicing agency for this machinery in Turkey. If possible, engineers from the Summerbank plant should repair it.
Edge-burnishing machine	Albeko (Federal Republic of Germany)	Operational. Manual has been obtained. No spare parts are available.
Skiving machine (Fortuna type)	Aydemir (Turkey)	Operational. The guides were taken from a machine from the Netherlands that is now in the Leather Goods Section.
Sewing machine model 196K301	Singer (United States of America)	Operational. Sewing hook has been repaired, but a new one is needed.
Post sewing machine model 236 G124	Singer (United States of America)	Operational. Facility to order spare parts needed.

<u>Machine</u>	<u>Source</u>	<u>Comment</u>
Sewing machine model 31 K21	Singer (United States of America)	Operational but very old and defective.
Patching machine model SG 26	Singer (United States of America)	Operational.
Leather goods sewing machine model 18-22 AJ 886573	Singer (United States of America)	Very old but operational.
Rubbing-down machine model SF9	Svit (Czechoslovakia)	Operational.
Edge-setter model SF 17	Svit (Czechoslovakia)	Operational.
Rougher and polisher model SF28	Svit (Czechoslovakia)	Operational.
Toe laster	Svit (Czechoslovakia)	Operational, but presently unused because the department has newer lasting machines and no compressed air facilities. It could be used for advanced training on machinery and in development work.
Naumkeag and polishing machine	Svit (Czechoslovakia)	Operational. Naumkeag abrasive required.
Colnol side laster No. 18623	VEB Ketter- und Nagelwerke (German Democratic Republic)	Not operational; lacks spare part for the carrier block. New tacks must be imported. Summerbank engineers agreed, several months ago.
Pulling-over machine	VEB	Obsolete with new lasting machines. Cannot be used as console without plated lasts.
Air-operated punching machine	Unknown	Operational. This machine can be adapted for various punching operations. Facility required for ordering press tubes.

<u>Machine</u>	<u>Source</u>	<u>Comment</u>
Edge-setting machine No. S 16	Vilh Pedersen (Denmark)	Operational.
Sole splitter	Vilh Pedersen	Operational.
Heel attacher	Vilh Pedersen	Non-operational. Trip mechanism needs attention. Maintenance staff may be able to handle this job.
Double-needle chain stitch sewing machine	Moemus (Federal Republic of Germany)	Operational. This is a suitcase machine that has been adapted to the force lasting of casual shoes. A manual is available. To use this machine for suitcases again would require the purchase of costly moulding machinery.
Sole skiving machine	Fortuna (Federal Republic of Germany)	Operational.
Open-ended press No. SF 20	Unknown	Operational. This machine is very dangerous and has little application since the acquisition of the Tuttoscarpa Atom press.
Stitching machines (2)	Vilh Pedersen	Operational.
Dust units (2)	Unknown	Operational. Others are required.
Sole trimmer	Ferrari (Italy)	Operational. Cutters are easily available in Istanbul.
Sole rougher No. SF 12	Desma (Federal Republic of Germany)	Operational.
Bottom-scouring machine No. SF 14	Svit (Czechoslovakia)	Non-operational. Requires felt rollers and abrasive.
Hand-cutting boards		Board oil is urgently required to keep these in condition, but no action to obtain it has been taken.

a/ Ordered in 1971 and operational in 1976.

b/ The punches were picked up and paid for by a member of the international staff.

Annex IV

SHOE CONSTRUCTION IN TURKEY

In the trade, "shoe construction" refers to the manner in which the shoe upper and sole are assembled or joined. There are ways of doing this to meet the requirements of shoes of all kinds. In Turkey, the most usual method is by means of a lock-stitch or chain-stitch seam. This very old method has, in many other countries, been largely superseded by various systems of adhesive attachment "sticking on" that require less labour.

It is very possible that Turkey, which still uses traditional stitching methods, may have an important advantage, since there is a considerable demand for shoes made in this way if their price is low and their quality acceptable. The production of shoes of this kind is declining in most countries; owing to their high labour content, they tend to be expensive. It might well be possible for Turkey to meet this demand and take advantage of her established methods if it obtains the machines and materials required.

An advantage of this traditional method is that the seam goes through the sole, insole and upper, thus uniting them securely. Where a fibreboard insole is used, it will be secure for the life of the shoe.

In almost every respect, Turkish shoemaking is a victim of tradition. Because of problems with lasts, machines and materials, almost no efforts have been made to come to terms with modern shoemaking technology. The most successful developments have centred around non-traditional shoemaking materials, namely fabrics, rubber and plastics. Indeed, it is probably true that it has been the development of the production of these materials that has saved Turkey's shoemaking industry.

Injection-moulded plastic shoes

Turkey's plastics industry is well developed and produces first-class materials. Very inexpensive plastic shoes, moulded in one piece, are not only very popular summer shoes but are also worn the year around by many low-income people.

Vulcanized shoes with plastic uppers

There are many shoemakers who make this type of footwear in well-organized factories. There may be as many as 30 of them, producing 20 million pairs of this plastic and rubber footwear. All of the equipment is Turkish made, and the materials are also produced in Turkey.

The method used is as follows: a non-stretch sock is sewn into the base of the upper, and this assembly is force-lasted directly onto metal foot forms (the equivalent of the normal wooden last), a coat of adhesive is then applied to the bottom, and the sole is vulcanized directly on to it. Considering the limitations of the equipment used, very good work is done. The uppers are cut by hand under very difficult conditions, as described in the body of this report, and sewn on a single-needle flat bed sewing machine. The manner in which the

socks are sewn in with dextrous movements of the hands in pleating the material around the toe is quite remarkable. There are special sewing machines for this operation, but in Turkey everything is done on one machine. This is an illustration of what good use Turkish workers make of what little they have; this is true of the entire shoemaking industry.

Vulcanized shoes with leather uppers

The process described above has been applied, with considerable ingenuity and expertise, to making shoes with leather uppers. The significant feature is that the lasting process, which is the basis of the traditional approach to shoemaking, has been eliminated. There are limitations in the styles and materials that can be used in this kind of shoemaking, however, and most manufacturers who practise it have only one basic design. Nevertheless, great variation could be introduced by decorating the uppers to add style and design.

The advantages that this process has brought to the Turkish shoemaking industry are threefold: elimination of the wooden last and the lasting process, stitching in the sock on a simple flat-bed sewing machine, and vulcanizing the soles directly on to the upper. These achievements are considerable and, with further development, could well have wider application in Turkey. Among the points for development might be better linings, toe-puffs, bottom fillers and sewing machines. There is also room for very great improvement of the vulcanizing machines.

With the exception of the cutting press, all of the equipment of the plant is Turkish made. It has been calculated that, with the exception of the cutting press and the rubber-making plant, the cost of the plant with an output of 700 pairs/day would be LT 1,180,000. When it is considered that a modern lasting plant of about the same capacity would cost about as much, the value of this technique to the Turkish shoemaking industry is evident.

The Maramara Scientific Research Centre should examine this equipment with a view to its further development. At present prices, and if their quality were improved, there could be an export market for the Turkish-made moulds used in this process.

This example demonstrates the Turkish capacity to innovate within a restricted situation and how methods have been transferred successfully from one type of shoe to another. However, having achieved such technical success with these shoes, it is disappointing that they are made only during a part of the year, after which production is returned to shoes with canvas uppers. The reason is not that the shoes cannot be sold but that there is insufficient capital to maintain stocks of them.

Direct vulcanization on to the leather surface is a notable achievement; this technique could well be exploited throughout the Turkish shoe industry. The co-operation between the tanner and the shoe manufacturer in developing a compatible finish and supplying the final spray coat indicates the level of co-operation that has been attained. There are obvious reasons for shoemaking on a wider scale based on these principles. These developments serve to illustrate the importance of having staff at LRTI, headed by a fully qualified local expert, that could further these developments at the greatest possible speed.

Veldtschoen

As noted in the text of the present report, shoes of this type would have many advantages during Turkey's summer months. Furthermore, the skills of the stitchers to make them could be transferred effectively from other types of work, such as the production of military boots. However, the expert encountered only one small shoemaker who had successfully developed this kind of shoe, using a heavy chain-stitch sewing machine that is normally used for slip-lasted shoes.

The technique is to fasten the upper exactly on to the insole with adhesive, stitch all around the edge and then force the last inside. The shoes produced in this way are really very good, but there is difficulty in forcing the last inside an ankle boot. The upper is damaged and distorted, and the last must be beaten so hard that it is very quickly ruined. This again illustrates the points made in the body of this report about the development of lasts and the simple use of force-lasting techniques, which save on the cost of lasting machines.

It has been calculated that, using this method, the time taken to last, stitch and attach and finish the rubber soles and heels would be about 11 minutes per pair. Given basic items of equipment and good lasts, this time could probably be halved, but even as the system stands, the ability to make shoes in Turkey in something like one half-hour with little capital equipment is truly remarkable.

The same type of chain-stitch sewing machine is also used to make plastic slipper-sandals but, as is true with almost every other kind of machinery, it is very difficult to obtain spare parts and fittings. As a small example, the expert once arranged through a party of Turkish visitors to the United Kingdom to be sent some spare parts and needles. The question of how such small but vital items can be made easily obtainable in Turkey still remains unsolved.

Slip-lasted shoes

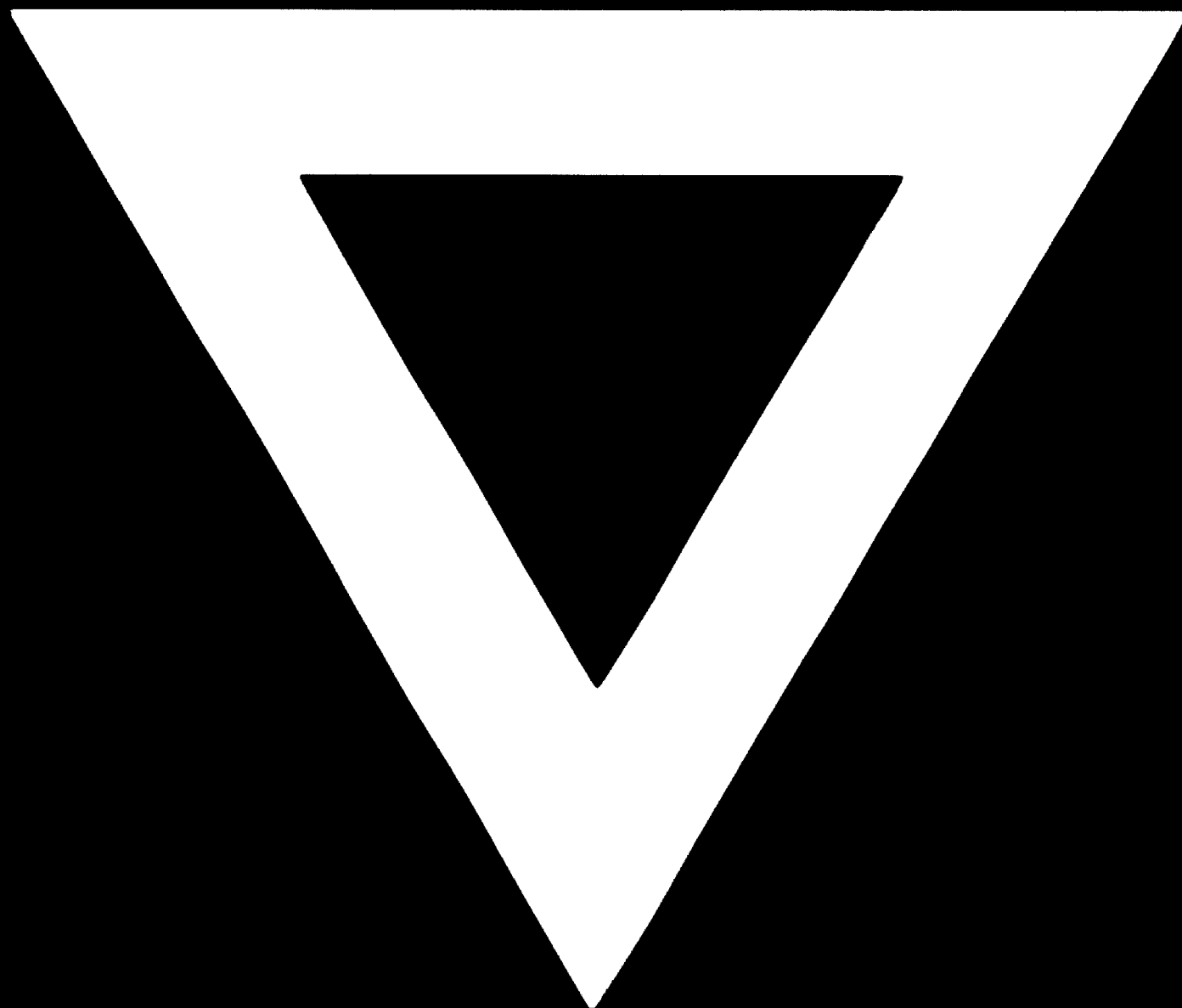
This method refers to the production of slippers, and there was insufficient time to study their production. Basically, the equipment seems to be the same although their price has led to better ways of producing them in quantity. They are made in standard designs. Some of these slippers are effectively decorated with gold braid, which is applied by machinery.

Stuck-on shoes

Shoes that are made with adhesives are gradually gaining ground and cutting the cost of shoemaking. However, because this process is not yet well understood, many shoemakers also stitch the sole afterwards. In most instances, preparation of the components is very poor, resulting in poor adhesion. All too often, soles come away from the uppers during wear. It is in this area that LRTI should concentrate, rather than on methods with which the Turkish industry is already well acquainted.



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