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UNITED NATIONS INDUSTRIAL
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THE STATE OF INDUSTRIAL DESIGN IN DEVELOPING COUNTRIES*

A Report on the Pilot Mission to India, Pakistan, Egypt and Turkey
Late February to early April 1978

by

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UNIDO Consultant

* The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been reproduced without formal editing.

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TERMS OF REFERENCE

The United Nations Industrial Development Organisation - UNIDO - and the International Council of Societies of Industrial Design - ICSID - a non-governmental organisation having consultative status with UNIDO, signed a Memorandum of Understanding in April 1977.

This Report results from a pilot mission arising out of the UNIDO - ICSID co-operation scheme.

The terms of reference for the mission were: to visit India for two weeks, Pakistan, Egypt and Turkey for one week each; and in close co-operation with SIDFA's, governmental organisations, N.G.O's, industrial design societies, to examine the level of industrial design activities in those countries, attend and address a one-day national meeting on the subject of industrial design, and explain UNIDO - ICSID efforts on that subject to government officials, industrialists, related university staff, industrial designers; and try to identify their needs in industrial design and to recommend ways and means of satisfying these needs through the UNIDO - ICSID co-operation scheme.

The mission took place between February and April 1978.

This Report is submitted to the United Nations Industrial Development Organisation in the hope that it will make a material contribution to their programme of aid and assistance to developing countries throughout the world.

PREFACE

To compress the results of five weeks of intensive study and research into a manageable sized report is an unenviable task, as to do justice to the amount of information gathered would require a treatise as long as a classic novel such as "War and Peace"!

Industrial Design, as has often been said, is more easily explained than defined, and the same can be said of tne state of the art in the countries visited on this mission. Ideally one would like to elaborate upon the subtle interaction of history, philosophy, social and cultural backgrounds; technological and physical considerations and so on which together influence the development of industrial design, and which, despite its enormous technical and scientific content, is an art, not a science. It is concerned with people - their hopes, needs and aspirations.

For ease of reference it would be logical to classify and group the organisations visited and present them in tabulated form, but to do this would be to give the impression of an organised system of things, which does not in fact exist.

All too often not only does the right-hand not know what the left-hand is doing - it does not even know that it exists!

I therefore present my report in a simple narrative style and in mainly chronological order, as this way best describes and identifies "their needs in industrial design".

As to "satisfying their needs", it is obvious that as the great majority of the needs of the four countries are virtually identical, I give one concluding section with general and specific proposals.

I ask that this report be circulated in its entirety and not sent in separate sections to the individual countries. Everywhere the need for comparisons was evident and everyone should have the chance to see how they compare in this report.

I am deeply conscious that each paragraph could be expanded to far greater length and that many of the points will not be as clear as I would wish. Where I have criticised, my intention is constructive and helpful.

I was impressed by the friendliness and co-operation of the many hundreds of people I met, from high Government officials to the drivers, who so often added much background information. They cannot all be mentioned individually by name but I offer my heart-felt thanks to each and every one of them.

I have the greatest optimism for the development of industrial design in India, Pakistan, Egypt and Turkey. An awe-inspiring amount of work needs to be done - let us go to it with a will.

Industrial designing is caring about people.

INTRODUCTION

1.1 The purpose of the mission was to examine the level of industrial design in the countries visited by meetings and discussions with government officials, industrialists, academics, professional designers and other interested parties, to identify their needs in the development of the subject and to recommend ways and means of satisfying these needs through the UNIDO/ICSID co-operation scheme, and in the process to explain UNIDO/ICSID efforts on their behalf.

1.2 This by any standards represents a monumental research programme but additionally it had to be accomplished within a space of five weeks and with but little opportunity for advance planning and preparation. However as such a mission had not previously been attempted, the basic information needed to plan a balanced research programme did not exist. Part of the operation, therefore, was to establish the links and lines of communication which will facilitate future developments which may arise from the recommendations and information contained in this Report.

1.3 In this instance longer preparation would not have been beneficial. It would not have cleared up misunderstandings as to the nature of "industrial design", which was frequently confused with factory development and plant lay-out. This led to suggested programmes of visits and meetings which were not suited to the purpose of the mission, but the process of sorting out the misunderstandings and the re-programming of events meant that the processes of industrial design had to be explained in depth. This afforded ideal opportunities of making the subject matter clear and produced a far better understanding of the subject than might have been the case.

1.4 Shortness of preparation time also imparted an urgency to the proceedings that might otherwise have been lacking, and momentum once created carried matters along at a satisfying pace. Thus it was possible to accomplish far more than the time scale would have implied, but whilst these factors turned out to be to the advantage of the mission in this instance, it should be emphasised that great care must be taken in the future to see that fuller preparation is possible.

1.5 It has been said that it is easier to explain industrial design than define it, and as it was necessary to explain the meaning of the term "industrial design" at the start of every meeting, both large and small, it is perhaps advisable to state the case made at this point in the Report. English is commonly used in both India and Pakistan, all technical drawings are annotated in English by the Egyptians and it is the everyday language used in the Middle East Technical University in Turkey. Obviously the standards of accomplishment in the use of the English language vary greatly. Apart from the pure academic level of attainment, the use of the language in translation from the vernacular varies from country to country. As a means of communication

therefore, it needs to be used with far greater care than is usually the case. If words which have fairly elementary meanings can cause problems, what of words which convey abstract thoughts and ideas? The use and condonement of design jargon is therefore inexcusable as it simply serves to create even greater confusion. For example, take the following phrases which completely mystified those who were asked to explain their meaning in the countries visited. "Cleanliness and quietness as a basic non-pollutant design ingredient must be built into the new products of industry". (A former U.K. Secretary of State for the Environment). Jargon as a pollution of language is as great a manace as any form of pollution. Why talk of buildings when you can talk of "the local controlling of energetic patternings of the universal manifold of high and low frequency events"? (Buckminster Fuller RBS Reader, page 85).

1.6 ICSID has found great difficulty in creating an acceptable definition of the concept of industrial design and it is obvious that we start with the handicap of there being a different meaning for every key word held by each person. An ICSID definition of industrial design is:

> "Industrial design is a creative activity whose aim is to determine the physical form of objects produced by industry. These physical forms are not only the external features but principally those structural and functional relationships which convert a system to a coherent unity both from the point of view of the producer and the user. Industrial design extends to embrace all the aspects of human environment which are conditioned by industrial production."
> (Author: Tomas Maldonado)

Note: Even in this case the author has replaced Maldonado's original term "formal qualities" with "physical form" due to the ambiguous meaning of the word "formal" which in common English usage more readily relates to "formality", the opposite of informality, and is furthermore associated with rigid formal standards. The term, whilst grammatically correct, is nevertheless confusing and is best avoided.

1.7 As to the person responsible for the process:

> "An industrial designer is one who is qualified by training, technical knowledge, experience and visual sensibility to determine the materials, construction, mechanisms, shape, colour, surface finishes and decoration of objects which are reproduced in quantity by industrial processes. The industrial designer may, at different times, be concerned with all or only some of these aspects of an industrially produced object."
> (Author: Sir Misha Black)

1.8 Industrial design can be explained in terms of a series of triads which can be illustrated as triangles which makes a useful visual mnemonic, not only helping the memorisation of the different facets of the subject but also showing their interdependence. There are four main parts of the subject:

1. **The Design Considerations**
2. **The Background**
3. **The Means**
4. **The Designer**

1.9.1 1. <u>The Design Considerations</u>

The basic principles of good design are timeless and have existed unaltered throughout the history of

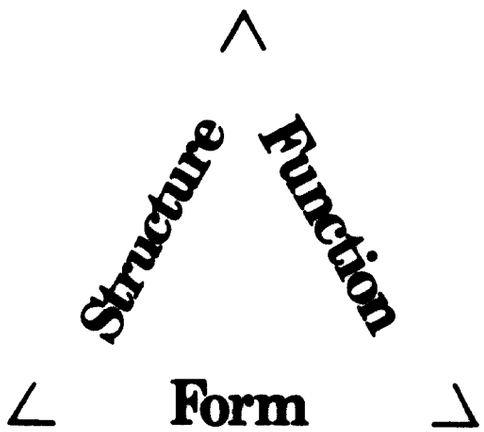
civilisation. They apply equally to architecture or other man-made objects and are probably most gracefully described in Shakespeare's 16th Century English as:

'Firmness' - 'Commodity' - 'Delight'

which we would now translate as:

'Structure' - 'Function' - 'Form'

1.9.2 A good design is one in which there is a true and rational harmony of all three aspects, where the functional performance required of the object is met by a logical and economic structure creating an agreeable and acceptable form. This is the basis of good design and the ultimate yardstick for all judgements, and can be illustrated as an equilateral triangle.



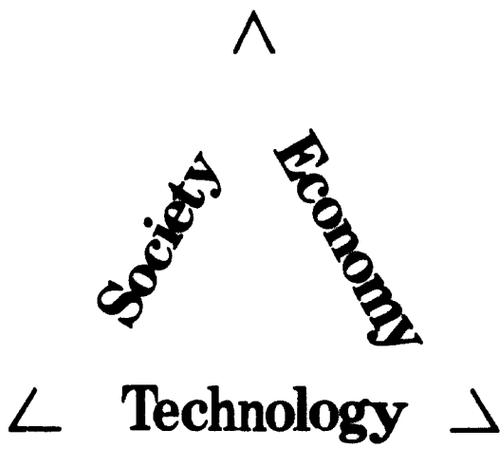
1.10.1 2. The Background

A design problem or its solution cannot exist in a vacuum - it exists as a part of a condintuing tradition. Now is preceded by yesterday and tomorrow is unknown; therefore the background to design is now and yesterday. History is an important part of the background, and by extrapolating history we can form views of what the future might hold.

1.10.2 The trend of development in any one field of human endeavour usually follows a basic pattern. As we proceed through time, the abilility to meet a human need follows a logistic growth curve in which a slow start is followed by a rapid climb to an ultimate plateau as a technology reaches the limit of its capability. Shortly before the plateau is reached, a second superior technology often appears and the growth pattern is repeated; this may possibly be followed by the appearance of a third and perhaps even a fourth technology. Knowledge of the past is a guide to the future, and an awareness of this is essential to the promotion of design in developing countries.

1.10.3 The manner in which we live can be described as yet another triangle:

'Society' - 'Economy' - 'Technology'



1.10.4 The <u>social factors</u> are those imposed by Society by the sets of values - usually highly arbitrary - that we create for ourselves. Of the things we believe to be important - "keeping up with the Jones's", the status syndrome, is regrettably a manifestation of much of our social motivation, but there are others fortunately.

1.10.5 Economic considerations also vary widely and consist of many self-imposed idiocies - point of sale or 'luxury' tax anomolies. Buildings designed at low initial cost with inherent high-cost maintenance problems, but which show the developer a handsome profit.

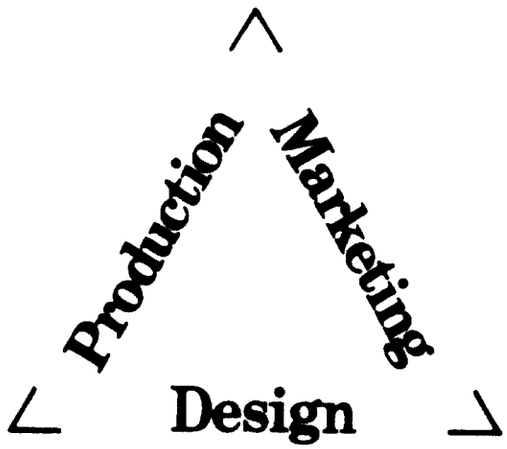
1.10.6 Technology or technical ability is the means of producing artefacts in the country concerned with available skills and plant, and is not to be confused with what is theoretically possible.

1.10.7 A good design solution is therefore something which is socially acceptable, economically possible and technically feasible.

1.11.1 3. The Means

Having considered the constituent forces of good design and its background, how can it be realised? The third triangle is:

'Design' - 'Production' - 'Marketing'



1.11.2 The design considerations and general background must now be related to the actual means of production available for a specific application. The plant that a

particular producer has - as opposed to the technical ability that exists theoretically - must be applied to the production of an object to be sold to the society that exists, and so a further triangle is formed. Complete harmony is required in this relationship for real success.

1.11.3 Design is a very complex and involved process and it embraces all aspects of human needs and activities. Good design is a real force for growth and encompasses sound value analysis which leads to a better utilisation of resources with higher productivity and greater profit and pleasure for all.

1.11.4 Good design is for <u>people</u> and only by understanding people's needs and ambitions is it possible to provide for them. Good design therefore can be a really powerful influence for the common good.

1.12.1 4. <u>The Designer</u>

Who then is to guide these processes of immense complexity - for they are indeed immense. A motor vehicle involved the co-ordination and use of hundreds of different materials, as different as silver and sugar cane, cadmium and coconut oil. The stride from clay model to mechanical reality is a long one, requiring the highest level of human skill and mechanical sophistication. This compared with the bullock cart, another perfectly feasible means of transport which can be produced by two craftsmen; a blacksmith and a carpenter. Working with a limited number of materials, each craftsmen is fully conversant with all of the design considerations, but with modern industry the designer and the component producers can be poles apart.

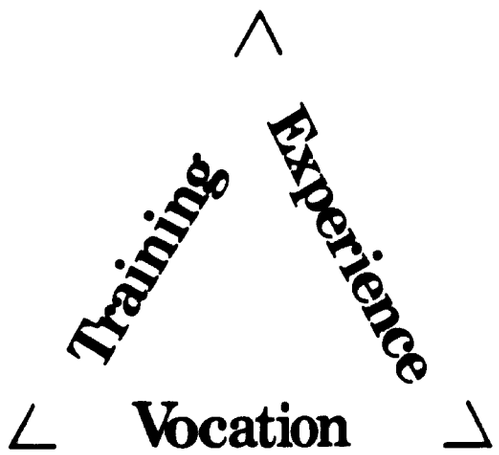
1.12.2 It is difficult easily to comprehend the modern

designer's role because there is a wide range of possible involvement. The producer of a material becomes the designer of an object, of a building, or of a city; and the relationship of the man to aesthetic perception varies as base material is slowly developed into the subject of an emotional experience.

1.12.3 Objects themselves can be graded from those evoking non-emotional to highly-emotional responses. Clearly the industrial designer must at some point merge into the architect, as indeed the architect into the city planner. The industrial designer occupies an extremely wide band on the spectrum of human experience, and so what sort of person should he be? Well, first of all and by far the most important is that he should be a human being. That is to say, he should have a considerable insight into human strengths and weakness for it is his job to be a "counsel for humanity". He must reconcile the technical values of the pure engineer with human needs and requirements. He must have a sense of humour - (why do all telephones have to look like electronic devices? - why shouldn't one look like a banana?)

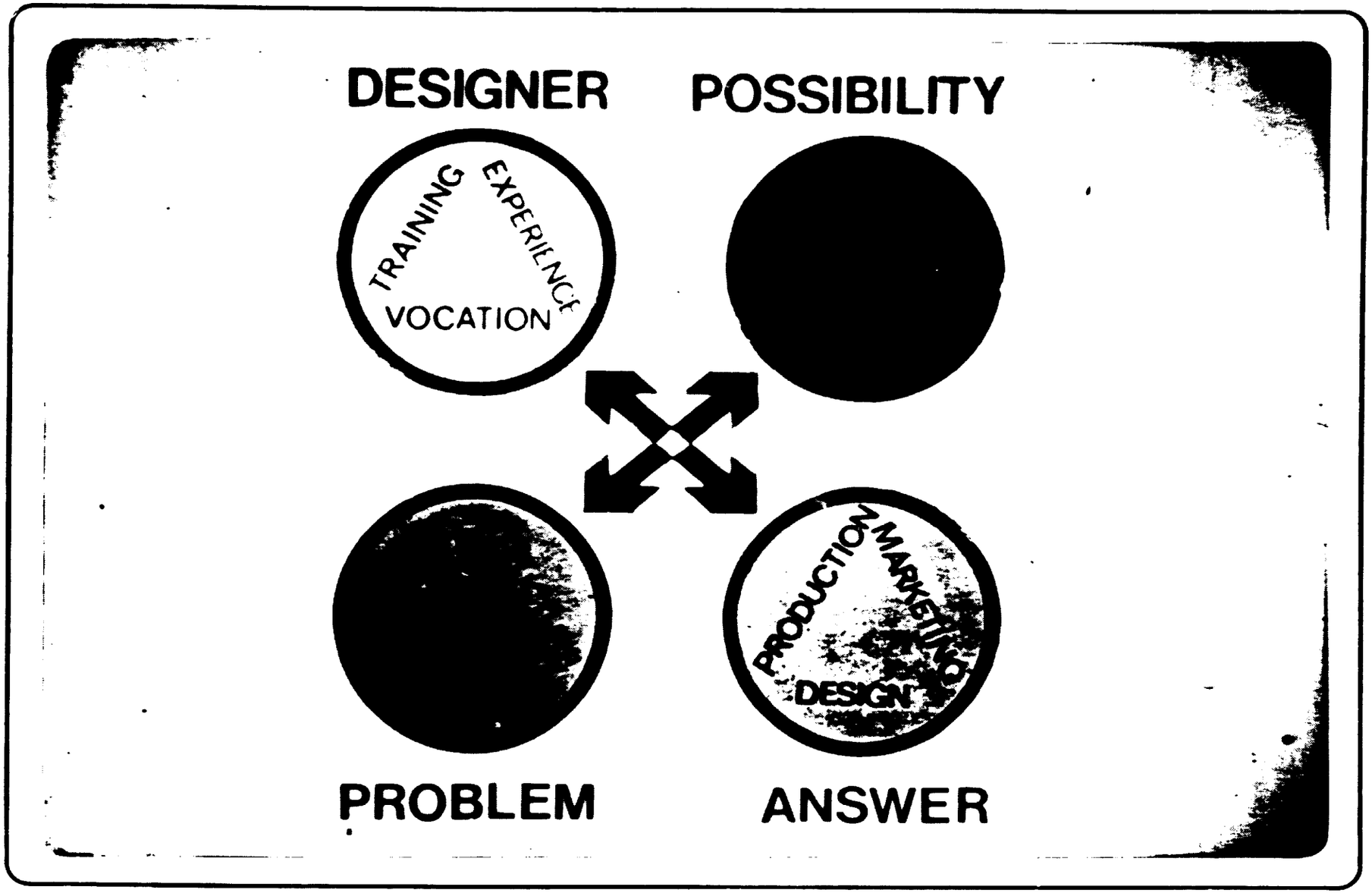
1.12.4 His range of knowledge must be wide. Both the physical sciences and the arts must be encompassed by his mind. He must be essentially logical and at the same time emotional. He must couple artistic freedom of expression with the discipline and gruelling concentration of a ballet dancer - a schizophrenic? No! because all of those attributes must be combined with a formidable single-mindedness and dedication. And yet the qualities he must combined are on opposite sides of the educational spectrum! The Arts and Sciences are inevitably treated as though they are positive and negative polarity.

1.12.5 A designer must have a sense of vocation, as design, notwithstanding the technical knowledge and skills required, is an art as well as a science. He must have training but he must also have experience. This is the triangle of requirements for the designer and it must be complete in all respects.



1.13 The training of designers therefore cannot be left entirely to the educationists. This, I realise, will cause immense administrative problems, but these will have to be faced and tackled if design is to be developed in a satisfactory way, and at the pace needed to achieve the economic growth that the needs of the developing countries demand.

1.14 In my considerations in this report I make recommendations as to ways in which we can rectify present anomalies and hopefully avoid adding to our problems in the futre. I ask for the effort to be made so that we may all triumph over the administrative problems.


DESIGNER
POSSIBILITY
TRAINING
EXPERIENCE
VOCATION
PRODUCTION
MARKETING
DESIGN
PROBLEM
ANSWER

"Give form to the yet unformed, speak out and express"

Rajjab (16th C)

BOMBAY - State of Maharashtra

2.1.1 Arriving in Bombay in the early hours of 28th February, I was met at 10.00 hours by Mr. Hamrajani of U.N. and Prof. Nadkarni of the Indian Institute of Technology.

2.1.2 I went almost at once to the Chamber of Indian Merchants and addressed a meeting. Due to rapid introductions, I could not be sure who was there, but I asked for a list of participants to be provided and this is given at Appendix 'A'. I was warmly greeted and introduced by the Chairman, and was garlanded and presented with flowers in the Indian manner. I then addressed the meeting using my paper "Design as a force for growth in the 20th century" as the basis.

2.1.3 It is difficult on these occasions to judge whether one's words are being understood, but the question-and-answer session went well and so I believe I was understood. A number of people asked for copies of my paper, which I took to be a good sign. Following this I met Prof. Nadkarni and members of his Faculty which provided a good introduction to my stay in India.

2.1.4 The 1st March was a very busy day and events can best be described in classified rather than chronological order. I visited the nearly completed "World Trade Centre" of Bombay - which had been represented at the previous day's meeting. This is an interesting and well thought out project but will, I think, have little direct bearing on the development of industrial design. It is obvious that they will have many financial problems of their own and will not be able to promote causes other than their own.

2.1.5 I visited the showrooms of GODREJ and TATA and was able to see the capabilities of the more advanced and sophisticated Indian industrial organisations. These compare well with Western standards, although their representatives are apologetic about their inability to provide the full range of sophisticated goods available in the West. Although why every country should provide the same goods - calculators, for example - seems a doubtful assumption.

2.1.6 GODREJ make very high quality furniture and their standards are not inferior to any others. However it is sad that the first chair I saw was of Scandinavian design in itself "derived" from an American original. Their refrigerators are equal to Western models but do not seem to use the latest developments in design and construction which are more economical. The useful thing I discovered at this point is that the Indian Government considers refrigerators and electrical fan units as "luxuries" and imposes a 20% + 20% tax. This clearly makes what might be considered as "essential" items in this hot climate luxuries and restricts their availability to the better-off sections of the community, and at the same time frustrates the development of India's own industrial production.

2.1.7 The factories of LARSEN & TUBRO produce switchgear of Indian design and manufacture. They are a very advanced concern and have nothing to fear, although they are apprehensive anout the activities of the multi-nationals - Siemens, English Electric, etc. - who have great research and development facilities in their home countries. Larsen & Tubro have the largest share of the Indian switchgear market and have considerable exports. Their design standards, both technical and aesthetic are good and they have no problem as far as I could see that could not be resolved with the aid of an experienced general consultant designer. Their graphics on switchgear and components could be much improved if it were not in the hands of the publicity department.

2.1.8 They only have the concept of a full-time paid staff designer and whilst to have such a person would be a good thing, it would not be the same as the part-time services of a consultant, who could offer a wide range of experience. The air of confidence that the right person could impart is possibly just as important as the design input that could be provided.

2.1.9 I met the President of the All India Institute of Manufacturers and Dealers Association, Mr. P. Sandell of FORBES & FORBES, and had a most rewarding discussion. He works closely with Prof. Nadkarni (as indeed does Mr. I.C. Joseph of Larsen & Tubro) and clearly understands the need to develop the smaller industries and to cater for the needs of the rural population and the not so well-off, being aware that a true approach to industrial design will produce forms not in the conventional Western mould. Such clear thinking and basic objectivity could be of great assistance to any initiatives which result from this ICSID/UNIDO mission.

2.1.10 The faculty of design of the Indian Institute of Technology at Powai, about an hour's drive from Bombay, is doing sound basic work and deserves more encouragement than it appears to get. Perhaps an outside expert, possibly in the role of visiting/ corresponding Professor, might be one way of providing a much needed injection of confidence into the system. It would also be wise to have someone to attempt to direct their efforts in a more concentrated way. Their UNDP programme proposal deserves support, but it might be advisable to simplify and reinforce some of its proposals; this is discussed later in the report.

2.1.11 I then met members of the Society of Industrial Designers of India. This is a small and struggling new society apparently unaware that all of the major societies in other countries had to face, and for that matter many still do, the trials and tribulations that they are currently experiencing. They need greater recognition by Government and other bodies but do not seem to realise that this has to be won by their own efforts. It would, however, be a boost to them if they could become a full member of ICSID which at present they cannot afford. We should seek ways of overcoming this problem. A statement of the SIDI point of view is given at Appendix 'B'.

2.1.12 There is a great lack of confidence in design matters at all levels and this needs people that they can lean on for <u>encouragement</u> - not to do the job for them. Propagation of the benefits of industrial design needs to be carried out at (a) The decision making level: (b) industrial executive level: (c) line engineer and executive level.

2.1.13 The training of designers needs support and encouragement with experienced people from developed countries

who can hopefully keep the main objective in sight from the outside. The greatest impact can be more quickly made by selecting the more receptive elements of small scale industry and developing a design consultancy service which would be available to them on a financial basis that they could cope with.

2.1.14 The more sophisticated industries could also be encouraged to make use of consultancy services that would bring a wider range of knowledge within their grasp than that to which they are at present accustomed. Government must be persuaded that its tax laws have a direct effect on the growth of their indigenous industries and should carefully re-appraise their current concept of what constitutes "luxuries".

2.1.15 Note: The old caste system has brought about a situation where the intelligentsia do not have a tradition of manual skills - i.e. graduate engineers who do not know which way to turn a screwdriver! - and it will take a generation to reverse the process and remove the concept of manual skills as beneath the dignity of the educated classes - a considerable disadvantage to learning by projects as is customary in virtually all forms of design education.

2.1.16 I discussed the UNDEVPRO of the Industrial Design Centre of the Indian Institute of Technology at Powai with Prof. Nadkarni. This programme has, I believe, made some progress through the various stages to final approval. It is certainly worth supporting and for what it may be worth I add my recommendations, which were later conveyed to the UN office in New Delhi. The programme outlined is, of course, enormous and could in no way be completed within the three years' duration of the programme. However as Prof. Nadkarni states, all aspects are vital to development in India

and once started, there is a far greater chance of their being carried forward to completion. I support this view but it must be borne in mind that he will need further support from both his own Government, which must be encouraged to have faith in this concept, and from UNIDO.

2.1.17 One positive suggestion I made which was sympathetically received was that a 'corresponding' or 'visiting' professor be appointed to act as a kind of external assessor. Not a great deal of time would be required per annum but with such a large development programme and so many practical day-to-day problems, those in charge of the project on the spot may be diverted from, and possibly lose sight of their main objectives. If they knew that, for example, every six months or so someone was going to visit them to discuss progress and offer advice, then I believe they would make the effort to review their progress and take stock of the situation. Prof. Nadkarni agrees with me that such an addition would be of the greatest possible value, particularly as authorities seem to be more inclined to take notice of 'strangers' and helpful intervention might occasionally be called for.

2.1.18 On the 2nd March a meeting with the Association of Indian Engineering Industry (Western Region) and the Indian Machine Tools Manufacturing Association was well attended and the participants are named in Appendix 'C'.

2.1.19 Although concerned with machine tools and plant manufacture, this meeting produced more constructive results than might have been expected. There was, of course, the inevitable confusion over the meaning of 'industrial' design. This is not always a disadvantage as it provides an opportunity of establishing at the outset the ICSID definition of the term. In the design

of machine tools and plant, an industrial designer's contribution might amount to no more than 10% of the total design input - compared to, say, fashion goods where it could be of the order of 90%. Nevertheless it is a very important part of the design process and does affect sales, particularly export sales. Industrial design as a profession should also be of concern to machine tool manufacturers as any industrial development caused by increased sales of products, whether at home or abroad, must inevitably affect their own industry.

2.1.20 I was then asked if anything could be done as part of the ICSID/UNIDO programme to promote a study workshop to examine particular problems. We then had a discussion on their "workshop" and seminar concepts and we agreed that these were in the main talking shops concerned with generalities from which little concrete emerged.

2.1.21 This seemed a good time to explain the "Interdesign" concept which I did in some detail, pointing out that this was something that could easily be brought about by the Association itself without recourse to UNIDO for funding. To put this in context, I explained that the total cost of running an "Interdesign" in India would amount to no more than forty to fifty thousand rupees - (probably less in fact) and that this meant, with their membership of 1,000, that a levy of a mere fifty rupees per head would adequately cover it.

2.1.22 It was generally agreed that money was not, in fact, a problem but that a lack of expertise was. We agreed to pursue the matter further with a view to organising an Interdesign on the problem of establishing and maintaining standards in production and educating the work force to this end. From past experience this would seem to be an eminently suitable Interdesign subject

and taking into account the educative nature of the process on the indigenous members of the team, likely to be far more effective than conventional seminars. A successful Interdesign could have a widespread effect throughout industry generally owing to the nature of the Associations concerned.

2.1.23 It was obvious from the atmosphere of the meeting that it was felt the exchange of views was generally most beneficial and I think a lasting contact was established, but we must follow up.

2.1.24 In the afternoon a meeting was arranged with the Export Promotion Council. Again very well attended, see Appendix 'D', and most ably chaired. The general unawareness of the subject to be discussed again provided an excellent opportunity to state the case clearly. As the Chairman put it, I had "not only brought light to their darkness, but poured illumination upon it"! There are some sixty Export Promotion Councils in India, organised on a commodity basis.

2.1.25 A general discussion ensued which provided much valuable information on the nature of Indian industrial development. I made it clear that UNIDO did not exist to do their job for them and that they were quite capable of solving many of the problems they had raised themselves. Again the point emerged that money is not the main obstacle. The various trade associations and councils are quite able to find the comparatively small sums of money that are needed to fund the provision of the necessary design expertise. There is a lack of expertise and confidence and one of the main tasks of UNIDO/ICSID must be to find the right people to help them.

2.1.26 Teachers are needed - not academics in the conventional sense, but gifted designers who can impart their know-

ledge and nurture and encourage others. In the past under various aid programmes, designers, many of the most illustrious names in the world, have been sent to help, but they have dealt with a project and then left, leaving nobody any the wiser for their presence. This is not the sort of assistance that is needed. Indian designers and industrialists must be encouraged to find their own way and develop their own solutions to design problems. They need people who can show the way, people who can start with the basic understanding of craft and industrial skills that the indigenous population have or are capable of acquiring. To this end it would be worthwhile promoting a research project to establish what are the inherently cultural skills in the various regions - e.g. silk in Bengal. Skills which have a deep-rooted past and are capable of development. I do not mean touristy souvenir or "folksy" skills but rather of the types of which the age-old culture and skills of Japan, with its obsession with fine detail, which have been instrumental in leading to the modern advanced technology of miniaturisation and to which their skilled work force is by tradition temperamentally suited, is an outstanding example. Indians have trained elephants - Africans do not have trained elephants.
Question: is the Indian elephant more intelligent than the African elephant, or are the trainers responsible?

2.1.27 The Export Promotion Council was naturally concerned with packaging and as the Indian Institute of Packaging was represented a little, internal communication was established! There are again different packaging problems which need to be more fully explained.

1) Packaging in the consumer appeal sense although the other factors of presentation, protection, etc. are involved, and

2) Visual communication as in the case of bulk chemicals, etc. for safety in identification, etc.

2.1.28 The problems of international standards of packaging, acceptability of materials for entry into countries or by shipping lines, seems to be something of a tangle. Hopefully there is a United Nations commission somewhere trying to sort out these problems which are causing real concern to exporters in India, and doubtless they are not alone!

2.1.29 An aspect which clearly emerged was the need of design assistance by the leather industries. They are being expected to copy designs of, for example, handbags from sophisticated countries. This presents enormous difficulties owing to the technological differences between industrial methods and cannot lead to successful products, as attempts to copy one process by another are doomed to failure. What is needed is the development of a design capability itself. All of the views expressed at the meeting exactly confirmed my view of the situation in India but added the encouraging fact that help would clearly be welcomed by the Industry.

2.1.30 The Central Leather Research Institute is located at Madras and it was thought by the representatives of the industry present that a <u>design</u> unit should be added to the Institute, which seems logical and worthy of support. Again the right kind of people must be found and sent. There is little or no suitable talent in India at present. I propose to discuss the requirements further at a later stage, but state here that a <u>permanent</u> programme is needed.

2.1.31 There also seems to be a need for the development of packaging <u>machinery</u> and <u>equipment</u> at the intermediate

technology stage, and expert help is needed here. Design assistance (and this may be mainly technical although not exclusively so) is needed in the handling of bulk chemicals, as 90% of the chemical industries' products are exported in bulk.

2.1.32 There should be an economic survey of the wisdom of exporting quite such a large proportion of various bulk products, including organic marine material, etc., when there exists a labour force that could be trained to produce finished and therefore more profitable exports.

2.1.33 Both at Larsen & Tubro and at the discussion with the AIEI, the subject of the difficulties of maintaining quality standards in production and general cleanliness and tidiness and care generally with a workforce that went home to incredibly low standards of housing accommodation and facilities was raised. The discrepancies are enormous and represent a real bar to progress.

2.1.34 During the evening I had a further meeting with Mr. Sandell; clearly we have the basis here for reinforcing the work of the Industrial Design Centre at the Indian Institute of Technology, This newly formed contact must be reinforced and developed.

2.1.35 I would like to note my appreciation of the assistance of Mr. Y.K. Kumar of the Export Promotion Office of the Ministry of Commerce in Bombay. The fact that at the outset he was not fully aware of what my mission was did not deter him, but I think that by the end of the day he was aware of the potential, from arranging the first class programme described above. Mr. Hemrajani did not take part in the meetings but has been always in the background ensuring the success of the mission.

2.1.36 The picture that was beginning to emerge was not complicated by contradictions and whilst many points for further investigation had emerged, there were nevertheless several positive programmes of aid which might well produce visible results within a reasonable length of time.

2.1.37 At this point in the mission I wrote:

> "If there were ever any doubts in my mind about the efficacy of such a hastily planned mission, these have now been completely dispelled. The very shortness of notice has been an advantage, in that it has injected an air of purpose and immediacy into the situation that might otherwise have been lacking. Shortness of notice has led to well attended meetings, punctual and distinguished by a directness of exchange that is most rewarding - I have the feeling that I have been speaking to real people about real things and whilst the fullest significance of the subject has still to be grasped, I feel that the basis of real understanding has been achieved. "

2.1.38 Note: Delay occurred at Bombay Airport due to the inability of Air India to decide when they proposed to fly to Ahmedabad! The scheduled time was 13.15 hours, subsequently revised to 11.25 hours and then shortly afterwards to 12.50 hours. Arriving at the airport for the 12.50 hours flight I was informed that it would depart at 19.30 hours. This meant the loss of half a day's work when I had only allowed one and a half days in Ahmedabad altogether.

Moral: It is not possible to programme as tightly as one would wish where internal domestic flights are concerned. This should be noted for future missions of this nature.

AHMEDABAD - State of Gujurat

2.2.1 Owing to the late arrival on Friday the 3rd March, I missed the planned Press Conference and very largely missed the dinner and cultural programme hosted by Shri Ashoke Chatterjee. A festivity had been arranged in the grounds of the National Institute of Design and in addition to the Faculty, staff and students, representatives of industry and crafts, members of the Indian Institute of Management and other important citizens attended. I did, however, see a little of the cultural activities which included a display by a number of street entertainers, which provided a valuable introduction to the daily life of the region.

2.2.2 A very full and well-organised programme had been planned but even so a number of important items had been omitted for lack of time. I therefore decided to extend my time and stay for the whole of the Sunday and include Monday to make up for the lost time, especially as they proposed to work over both Saturday and Sunday.

2.2.3 On Saturday 4th March the morning was devoted to visiting varying sizes of industrial enterprises housed on factory estates on the outskirts of Ahmedabad, which has a population of some two million. These factory estates are run by organisations which lease land for an entrepeneur to build his own factory, or they offer ready-made units in a range of sizes, which comprise factory space with a toilet block and mains service inlets. The units here are of brick construction with concrete floors. The smaller units have concrete slab roofs; the larger ones, asbestos sheeting on light

steel trusses. They are very basic and simple. Fuller information is given at Appendix 'E'.

2.2.4 The first firm visited was Systronics Ltd. who produce electronic measuring and testing instruments. They have a factory which is large in comparison to the others visited, designed and built by themselves in well laid out and well tended gardens. A description of this and other firms visited is given at Appendix 'F'. They have a highly skilled work force and due to the small number of each type of instrument required, they do not need sophisticated or automated equipment. They have a well laid out and well equipped machine shop and the other areas are also of good standard. They are using women in the electronic assembly section and this represents an advance in the area as women have not previously been offered this type of work. They have to train this sort of skill from nothing. They are aware of design problems and have collaborated with the National Institute of Design, and they appear to be willing to respond to further encouragement. This sort of enterprise, as the larger ones visited in Bombay, is already well on the way to achieving high standards.

2.2.5 The next firm visited was a clock maker, a "one man" show which in India means two technicians and a few labourers apart from the owner. They manufacture clock mechanisms literally from scratch, and 'buy in' very little except wooden clock cases and silk screens. They do their own silk screen printing. The equipment is basic and old but has been ingeniously adapted to perform the various tasks required. This is possible as there are comparatively few varieties of clock - one basic clockwork mechanism and one electric. They wind their own coils. The quality of finish is adequate but not very high and the design caters for

popular appeal. Their latest model, designed by themselves, is for a clock that looks like a TV set! Their most expensive clock has a "traditional" wooden case. This firm seems typical of the 'one-man' type enterprise which, in fact, has five or six employees.

2.2.6 Premier Ceramics is a medium sized factory making low cost ceramic household wares in fair quantity by what might be described as nineteenth century methods. It is therefore labour intensive which is an advantage and the work is paid on piecework rates, and appeared very efficient. Such a unit is not capable of improving quality above that already achieved and is suitable for their market. It is doubtful if an external design input would be of much value to them.

2.2.7 Ashok Machine Tools, on the other hand, could use design assistance. They concentrate on two models of lathe and are quite successful in selling them in India and to a variety of countries overseas. They are conscious of the need to improve technical quality, e.g. case hardening guides, etc. which they cannot do at present. Their design policy is to follow the example of advanced countries and copy a model but they do try to improve on the design and described to me a number of modifications they have made to the current production which seemed highly satisfactory. There is no doubt that this firm is willing and indeed anxious to obtain design support and would be prepared to pay for the services on a time or one-design basis, i.e. consultant designer basis.

2.2.8 I met the Ahmedabad Chamber of Commerce with members and guests representing all sections of industry in the city and the State. The Chairman gave a well-reasoned introduction (Appendix 'G') which accurately presented the case for design and so after a few introductory

remarks I used a question-and-answer technique. The information gathered here confirmed the similar meetings held in Bombay and it showed that apart from a shortage of designers - of which the National Institute of Design is acutely aware - there is a shortage of design organisational leadership - not at NID but in terms of people who could go into the field to found design units for various types of trade activity - e.g. sari makers. The textile industry needs design guidance centres according to their spokesman (I note a similarity of approach to the leather trade) and others thought that designer exchange or fellowship schemes might be helpful.

2.2.9 One person thought there should be a museum for pots! What he actually was concerned with was the lack of funds for establishing a collection of everyday ethnic utensils and objects which are rapidly disappearing. The National Institute of Design is currently doing some work on this, aided by the Indian Space Programme (sic). This is proving to be of value in their design education programme in that it is a method of bringing students face to face with the realities of life in India. But much more needs to be done <u>now</u>.

2.2.10 The design of the traditional bullock cart, of which some thirteen million are currently in use, was raised. It is thought that this method of transporting goods will be required for many years to come and that design improvements would be valuable. It seems to me, however, that anything which is the product of over a thousand years of evolution is not going to be improved very easily. There have already been a number of attempts to tackle this problem - competitions have been held, for example, but these have usually only succeeded in making the cart more expensive and therefore out of the reach of the people it is intended for. With some reservations, however, I note it as the subject for a possible future Interdesign.

2.2.11 Questions on the design and testing of pressure vessels are technical matters which should be referred to the relevant UNIDO agency or department and bottlenecks in tooling design fall into a similar catagory, except that the associations, as for example the Machine Toolmakers Association, are the people who should apply their minds to these problems initially.

2.2.12 Some form of instruction chart or manual is needed on how to approach design problems and where to take your problem, or how to state your needs by perhaps filling in a form of questionnaire, so that the matter can be properly and quickly routed to the proper destination so that help can be forthcoming. This is a subject for a short research programme.

2.2.13 This meeting was followed by a discussion with members of the press and a report was published next day. In answer to questions, I pointed out that India already has design traditions and design capabilities as well as Institutions such as the National Institute of Design which deserve greater support and encouragement.

2.2.14 Due to the extremely friendly and courteous attitude of my hosts we were able to continue discussions until late evening, thus enabling me to pick up considerable background information as well as adding to my fund of knowledge.

2.2.15 Sunday the 5th March started with a visit to the "Sunday Market" held on the banks of the river, the largest open space in the city. Stalls are set up early in the morning and thousands of the poorer citizens visit it to purchase mainly household goods. There were a number of interesting examples of re-cycled materials to be seen - old kerosene tins turned into respectable containers, oil drums into grain storage bins, etc.,

as well as well-made traditional cooking and storage pots in brass, which are sold by weight and engraved on the spot with the purchaser's name. Such utensils are also made in aluminium which is cheaper and lighter in weight and also in iron and steel. The whole range of cooking facilities is readily assembled, choice of coal or wood burning stove - very small, with fire-grid; hemispherical bowls for cooking, scrapers, perforated ladles, tongs for lifting the hot bowls, etc. All made individually by hand; crude but effective. Shapes are basically sound, as is usual in traditional, subsistence-level design. The application of modern technology could hardly do anything other than raise the prices!

2.2.16 Wooden furniture of very basic form was available - tables and storage units, mostly plain, in timber straight from the saw and relying on the plentiful use of nails. Some storage cabinets were painted with pictures of birds on glass panels or appropriate Hindu gods. The price of such a decorative piece is some twenty-five rupees, although with a charming honesty the trader told me that the price charged depended on his assessment of the affluence of the buyer. I found that with all the traders that once I had established the fact that I did not want to buy anything, information was freely given.

2.2.17 The traditional Indian bed - the charpoy - a simple rectangular wooden frame with turned wooden legs, sometimes painted - was sold as a frame and string or webbing support to choice added on the spot. These beds are multi-purpose objects in that in addition to their obvious use, they are used as counters for the display of goods, and stood on end they can be used to provide shade, and so on. This is a brief summary of many things seen - including the "retail outlets" of the cups, saucers and bowls I had seen manufactured on

the previous day - but it confirms, if indeed confirmation is needed, that before "outside" designers are sent to India some very careful training should be given, so that their approach is sound.

2.2.18 What has been said about visiting expert designers in Bombay was again repeated in Ahmedabad. "They come, they carry out a project and depart, leaving nothing of lasting value behind them." People must come here to lead and teach.

2.2.19 A visit to the Calico Museum showed the immense traditional riches in design of India. The temple hangings, saris and many other forms of textiles, with printing, patchwork, embroidery, etc. are most impressive and the techniques used were also of great sophi cication. A special form of blockprinting, where dye is poured into separate compartments in the block - many colours at a single time - is an ancient technique that recent experiments have failed tc emulate.

2.2.20 Much 'ordinary' hand block printing is carried on here, the finished cloth being washed in the river and spread out in the sun on the ubiquitous dry river bed.

2.2.21 During the rest of the day informal discussions took place - over meals and on visits to places of interest, such as a local village community, not the more obvious tourist attractions. These had the effect of putting flesh on the bones of ideas that were beginning to form. My hosts took great pains to allow me to see as much of local life and conditions as was possible in the time available.

2.2.22 A discussion with Prof. Ravi Matthai of the Institute of Business Management took place in the evening.

2.2.23 Monday 6th March was spent mainly at the National Institute of Design. I started by examining three of the diploma theses of students. All exhibited impressive evidence of research and presented well thought out and well argued propositions. Only a general lack of industrial and commercial experience was in evidence. A textile thesis had been developed by a student who had worked in a craft village and showed a thorough examination of the techniques of weaving, knitting, pattern making, etc. employed. Positive suggestions were made, with working drawings, for improving production by improvements to the traditional equipment. Such improvements being kept within the competence and capabilities of the village craftsmen.

2.2.24 A graphic design thesis showed a remarkable attempt to rationalise the varying scrips of Tamil, Hindu, etc. and produce letterforms of varying weights for general use. Again the evidence of thorough research and painstaking attention to detail in development was most marked.

2.2.25 A further thesis was concerned with an attempt to rationalise the cycle rickshaw. Originally developed to carry two adult passengers, these are now used almost exclusively for carrying goods or schoolchildren. The traditional form is not properly suited to this and the student had designed a vehicle which is. Much thought had gone into the mechanical means of propulsion but due to lack of facilities, mechanical proving of the concepts is not possible in the Institute. Similarly the chassis or framework had been developed in model form only as a full prototype could not be made. This clearly inhibits much of the development work that needs to be done. Therefore more support is needed to develop the National Institute of Design technical and engineering skills and provide essential prototyping facilities.

2.2.26 The study programme of the courses is of five and a half years' duration, of which the first one and a half years are spent on a common foundation course. This is well structured and comprehensive. There are three faculties:- Industrial Design, Graphic and Environmental Design. Each faculty being chaired by a professor. The full-time members of staff (there are no part-time members) practice as consultants and the Institute also engages in small scale production of ceramics, furniture and textiles, which earns revenue for the Institute. The craft design development programmes automatically provide design projects for the students and opportunities to obtain a better and deeper understanding of the national culture than they could otherwise hope to achieve. Some projects are tackled in co-operation with other Institutions, e.g. the Indian Institute of Management. The development of any craft project in real terms inevitably meets the main stumbling block in marketing and this is a problem that must be tackled seriously if progress is to be made.

2.2.27 The needs of the National Institute of Design are fairly obvious in the circumstances: more funds are needed to enable them to deal with the problems of unco-ordinated industries and to improve their own engineering and technical capabilities. An increase in the number of faculty members (staff) to permit their extra-mural involvement in a wider range of external projects such as Design "Clinics" (see under recommendations).

2.2.28 Funds are also needed to develop methods of disseminating information on projects developed by the NID and to obtain wider awareness of its existence and the services it has to offer. Such activities would include the publication of theses, such as those already described, which are of wide interest and application. The Institute had no facilties for glass

and leatherwork and this is a gap that urgently needs to be filled.

2.2.29 The lack of co-operation between manufacturers and designers is due to a mutual misunderstanding of each other's needs and this gap must be bridged by creating a greater awareness of the Institute's existence and the development of greater industrial experience within the Institution itself.

2.2.30 Testing facilities are needed because these are otherwise unavailable to the small scale manufacturing industries and the Institute's designers need to present better developed solutions if they are to gain credibility. The purpose of the National Institute of Design can therefore be described as threefold:

1) Solving design problems of manufacture
2) Selling the Institute's own developed designs
3) Placing the product of the Institute - the new generation of designers.

2.2.31 A further resource which needs to be created for the use of NID and others and is of national importance consists of collections of everyday objects illustrating the lifestyle and culture of the Indian people.

2.2.32 It would be helpful is ICSID/UNIDO collected information on the activities throughout the world in the development of intermediate technology and scientifically improved equipment, e.g. windmills. Various institutions in developed countries are spending much time and effort on such projects and these activities need to be more widely known. Some form of abstract or digest needs to be published.

2.2.33 I suggested to the National Institute of Design that they attempt to establish a samples library of their own by writing to manufacturers to ask for material, literature and physical samples, at the same time taking the opportunity to give a brief explanation of their own activities. This might go some way to achieving a greater awareness, but would need a considerable amount of work to establish and keep up to date. Again a short paper on the methods and possibilities should be prepared as an ICSID/UNIDO leaflet for general publication.

2.2.34 The intention of families who send their children to study at the NID is that they should obtain well paid jobs in industry, not go and work in the villages. This needs to be borne in mind when developing programmes for the craft skills.

2.2.35 However whatever programmes are chosen for further development, planning must be based on the concept of (a) immediate; (b) short term; and (c) long term programmes.

2.2.36 In addition to giving a lecture to all members of the National Institute of Design on Saturday, I met the industrial design faculty on Monday morning for an extended discussion. At their request a further session was held in the afternoon, the other faculties joining it. The students also wanted a further lecture session and this was arranged for 7.30 in the evening! This clearly illustrates their receptive attitude and a willingness to accept design 'expertise' from external sources.

NEW DELHI - capital of India

2.3.1 On Tuesday 7th March I travelled to New Delhi and had a meeting at the U.N. office before meeting the President and leading members of the Federation of Indian Export Organisations. The meeting held in Bombay was confirmed as having been highly successful.

2.3.2 It seems to me, and I have suggested, that some of the National Institute of Design programmes such as that for producing a film or visual aids for the dissemination of design information should be adequately funded through the existing Export Promotion Council members, and this view was sympathetically received. U.N. money should be spent on expertise and the Indians encouraged thereby to produce their own promotional material. National bodies such as the Machine Tool Makers Association, etc. could give real support to institutions such as the National Institute of Design, Ahmedabad, and the Industrial Design Centre, Bombay, by giving them some of the hardware they sorely need.

2.3.3 The afternoon was spent in a committee meeting at the U.N. office at which the proposed Industrial Design Centre, Bombay, UNDP programme was discussed. As the only person available having first hand knowledge of IDC and its proposed programme, I was invited to participate. The recommendations made earlier in this report were therefore made to the committee and I believe will be incorporated in it. I also gained some insight into the local workings at a UN office and the type of discussions which take place on projects.

2.3.4 Three Governmental meetings were programmed for Wednesday the 8th March and such information concerning my visit as had reached them had not given them any understanding of the nature and purpose of my visit. However it also, of course, gave an opportunity to "start with a clean slate" as one of them put it.

2.3.5 I first called upon Mr. Hari Bhusan who is Technical Advisor to the Department of Heavy Industry. After a slow start, we soon had a lively dialogue going. Mr. Bhusan proved to be a most knowledgable and sympathetic person and our talk lasted one and a half hours. His concern about UND programmes generally was the lengthy procedures and time-consuming administrative processes involved and the delays in releasing funds even when approvals had been obtained. He gave as an example a welding centre which he told me had been completed by the Indian Government - building and equipment - but could not operate until the UNDP equipment arrived and this had already led to something like two years delay.

2.3.6 He would like to see (i) UN aid go to existing design institutions with the object of teaching the teachers, and (ii) for established manufacturers, whom he likened to being in an "undergraduate state of development", to be given design assistance that he thought with "one push" might put them into the "graduate category".

2.3.7 On the subject of small scale industries, he stressed the avoidance of calling in expert aid and diluting their efforts over too wide a field. "Like pouring a bucket of water on the desert." It is necessary to select the most promising areas - where achievement could readily be seen. He well understood the need for design to be fully cognisant of the Indian way of life, stressing the need for household appliances to

be repairable, not disposable as in many 'advanced' (?) countries, and suitable for operation by those who lack previous operational experience.

2.3.8 We discussed the electrical components industry which he thought was badly in need of design help and he undertook to find half a dozen specific cases from which design programmes could be selected.

2.3.9 We then discussed the problems of selecting the right type of expert who had to be "someone who can be accepted". He then surprisingly said he would give me an example which was - during the last three days he had met two people from developed countries on missions to India, one from Belgium and myself. The former he totally rejected, the latter he totally accepted. He said that he recognised that I had a real understanding of their problems and he knew that I was most anxious to do all I could to help solve them. This I record not in self-congratulation but as one of the pointers, and happily there have been others, to mutual understanding and sympathy. My explanations of the nature of industrial design were well received and Mr. Bhusan was pleased with our discussion; this alone should help the cause of the Indian industrial designers.

2.3.10 The next meeting of the morning was with Mr. K.N. Ramswamy, Deputy Director-General of Technical Development. This meeting lasted one hour and he was joined by a number of his senior staff. This meeting followed similar lines to the earlier one, and again the explanation of industrial design possibilities was welcomed and gave greater understanding. I stressed the need for Government encouragement and support for existing design institutions and the struggling Society of Industrial Designers of India.

2.3.11 These meetings shed a little light on the subject at the higher governmental, i.e. technical not political, level. The people I met were all highly intelligent and knowledgable and their repeat summaries made to check their understanding of my remarks were very ably expressed and remarkably accurate.

2.3.12 The meeting in the afternoon was taken by Mr. I.C. Puri who is the Development Commissioner, Small Scale Industries, himself. He had invited representatives of all departments and these are listed in Appendix 'H'. We were fifteen in number. Although I had by then a good grasp of the Small Scale Industries situation, I asked for a "clean slate" start and Mr. Puri gave me an excellent resumé.

2.3.13 The small scale industries of India are responsible for about 40% of the national output and they are an export success. Nearly 200,000 such units exist all over the country and provide employment for over four million people. The Commission has a massive development programme for rural areas and is establishing a District Industry Centre network throughout the country for de-centralised control. To be classed as a small scale industrial enterprise, the unit must have a capital equipment investment of not more than one million rupees (125,000 U.S. dollars) at the present time.

2.3.14 They have chosen this method of definition in preference to, say, the number of employees, or the turnover of the capital investment as they do not want to inhibit the growth of these, in fact quite the contrary. Constraints exist only on capital goods, not on either land or people, both of which exist in abundance.

2.3.15 The Commission also seeks to encourage the very small unit with an investment of only 100,000 rupees (12,500 U.S. dollars) as they are perfectly viable propositions and, in fact, account for 85% of the small scale industrial units. The object is to stretch capital resources as far as possible, utilising labour. The encouragement of labour intensive activities is a significant point which should play a decisive role in the development of innovative Indian design.

2.3.16 The Commission has established the Small Industries Extension Training Institute (S.I.E.T.I.) at Hyderabad and has much experience in setting up institutes, and these exist for various aspects of design, electrical measuring instruments, etc. There are also four regional testing centres which exist not just for the purpose of certification but to report and give reasons for the failure of a product to reach an acceptable standard - these they describe as "promotional testing facilities".

2.3.17 Note: Although these undoubtedly do exist, there is a lack of awareness, amongst others I have talked to, of their existence. Furthermore it emerged that no-one present had heard of the Society of Industrial Designers of India, so there did not seem much chance of their getting Governmental encouragement at that rate. However I decided to do something to correct this situation unilaterally. Also although the Commissioner is represented on the Council of the National Institute of Design, Ahmedabad, there is a poor attendance record and a lack of awareness of the relevance of what they are doing, but I expect this is something that will receive a little more attention in future.

2.3.18 The financing of small scale industry is achieved by State Financing Corporations, of which there is one

per state. These corporations are re-financed by the comparatively newly established Industrial Development Bank of India. This is an off-shoot of the Reserve Bank of India which was mainly pre-occupied with national and international monetary affairs and so unable to concentrate on the particular problems affecting industrial development. Within the Industrial Development Bank a section is being created to concentrate on the needs of small scale industry.

2.3.19 Success in a previous trade fair had led to the organising of an International Industrial Fair for small scale industries which is to be held in Delhi during the months of November and December 1978. There is an awareness that the marketing problems confronting small scale industry must be tackled on a national scale. This can be done by (1) functional specialisations, and (2) geographically.

2.3.20 The National Small Industry Corporation can provide machinery, goods and materials on hire purchase, can pay for marketing similarly and also for some consultancy services.

2.3.21 My dissertation on the potential effects of good design and my insistence that production and promotion (marketing) are inseparable parts of the design problem were very well received and my analysis of the situation, based on the meetings and visits I have had, was judged to be "very right". They accept that there exists:

" (1) A deficiency in communications
(2) They have not given adequate attention to product design. "

My explanations certainly clarified many points and opened new avenues of thought for them. I endeavoured to start a dialogue between the Commission and the

National Institute of Design, the Industrial Design Centre and the Society of Industrial Designers of India before I left and reports received following my return to England indicate that this object was achieved.

2.3.22 I am thankful that I carried out my trip this way round, i.e. Delhi last, and not first as was originally proposed. I shudder to think what a mess would have been made if I had met Government representatives first and not been in a position to display a considerable understanding and appreciation of the situation following ten days of intensive study and research.

2.3.23 The people I met were highly observant - a word in Hindi to the tea boy that I quietly uttered brought an immediate observation from the Commissioner "I thought you said you had not been in India before". JR: "That is so". C: "But you spoke to the boy in Hindi". JR: "There are some words one must quickly learn for survival". Laughter.
Moral: an awareness of customs is very quickly seen and the judgement of one's general ability clearly affects their evaluation of observations and proposals. During the evening I met Dr. Jagit Singh, Secretary General of the Institute of Marketing and Management.

2.3.24 The Thursday 9th March meeting with Mr. M.R. Natarajan, Director of the Department of Economic Affairs, was cancelled and so I asked the Commissioner of Small Scale Industries to provide me with a guide so that I could see something of Indian life in Delhi, something I was in danger of missing altogether, and he kindly provided the services of Mr. R.K. Soni, Assistant Director concerned with management training. We, of course, had interesting discussions during the day and visited Old Delhi and a small scale manufacturer of handbags and similar artefacts as well as one or two ordinary bazaar

type shops where I was introduced to the proprietors; and the Cottage Industries Emporium where many well designed, beautifully made products were displayed, as well as the usual tourist souvenir type objects. Later in the afternoon I had been invited to a meeting at the Ministry of Defence, specially called to discuss their Republic Day Parade - Shri Ashoke Chatterjee having discovered from my curriculum vitae of my appointment as Pageantmaster to the Lord Mayor of London. They, of course, use architects and designers in the design and construction of floats but they were not acquainted with the concept of <u>designing</u> a procession as an entity. This meeting gave entrée to another Government department as it is as well to take advantage of every possible opportunity of emphasising the wider rôle of the designer in the world.

2.3.25 The 10th March was programmed with an important meeting with Mr. S.J. Coelho, Joint Secretary, Department of Industrial Development - the ministry responsible for the National Institute of Design. Shri Ashoke Chatterjee joined me in Delhi especially for this meeting, at which we discussed the need for design to start from the basic skills and materials rather than from pre-conceived ideas of product forms. Small scale industries clearly need common facility centres and quality control systems, not merely for approvals but in a diagnostic way to point out the reasons for failure to reach a required standard. In addition some attempt at standardisation is needed to avoid duplication and the complexities that uncontrolled component production can cause, and the marketing problems have also to be taken into account.

2.3.26 Where then does the industrial designer fit into the existing system in India? Where component manufacturers are concerned, and these are legion, it is necessary to locate the "mother" organisation, i.e. the

main user of the components and attempt to influence them and their design efforts.

2.3.27 At present there is no organised effort being made to liaise small scale industries with the larger organised sections of industry. It is important to note that licensing procedures, i.e. controls, for medium and large scale industries do exist. For example, a manufacturer wishing to expand his factory or production facilities must apply for a licence to do so. When this occurs, manufacturers are encouraged to "off-load" their additional requirements onto small scale industries wherever practical, but an organised effort to this end is needed.

2.3.28 However Mr. Coelho was of the opinion that there should be no standardised, or as he put it "ironclad" (i.e. inflexible) approach to the problems. This is simply not possible in India (if indeed it is possible anywhere else!) There is the serious problem of the overgrowth of the urban areas and it is necessary to de-centralise to the non-urban areas. It is furthermore of great importance to create consumption areas in the non-urban locations with the objective of increasing consumption and thereby increasing employment. As Mr. Coelho put it, "let a thousand flowers bloom". He further thought that there should be a flexible attitude towards a mixed economy, using the type of ownership most suitable to the type of industry concerned.

2.3.29 One of the urgent needs for the development of the right kind of design awareness is the establishment of information and resource centres. Documentation of existing products, traditional and modern, materials samples, prototypes, production models and samples, all of these are needed to avoid wasted effort and to speed

up the design processes. There is a tendency for small industries to "jump on the bandwagon" when success is evident in a particular field of endeavour - e.g. the comparatively recent boom in cheesecloth production due to the sudden fashion for it in the West. Many manufacturers of other materials jumped into this market, only to have their fingers burnt when the popularity wave passed. It is not possible to prevent this sort of problem by any sort of legislation in the form of a design registration scheme, etc. even if intended to reserve the rights of a locality to the local traditions, but it is necessary to foster a localised approach to design.

2.3.30 It is also necessary to maintain a vigilant guard by evaluating all aspects of new design. It is in fact quite easy for a designer to put thousands of people out of work if the proper questions are not asked or the design work does not start from basic principles. The National Institute of Design can supply case studies of this sort of problem. Innovative design is essential for the development of the Indian economy and it must strive to increase employment, not decrease it. It will be necessary clearly to demonstrate industrial design as a process of research and investigation leading to problem analysis and problem solving, and it will need to be spelled out, in some detail that, as Ashoke Chatterjee says, "sometimes the design end is a process not a product".

2.3.31 We then discussed the proposed UNIDO/ICSID developing countries conference planned for India later in the year or early in 1979.

2.3.32 A meeting was arranged with Mr. Kan D. Mariwalla, Chairman/Managing Director of the National Industrial Development Corporation. Given the outline of the present UNIDO/ICSID mission, his immediate reaction was

that it 'strikes a sympathetic chord" as he is greatly interested in the development of industrial design as distinct from technical design. He has, in fact, written a paper which makes specific reference to this subject and undertook to provide a copy of it for reference (Appendix 'I') The National Industrial Development Corporation was established in 1954 to formalise the appraisal of industrial development as previous proposals had been considered in an unstructured way by administrators in a variety of Government departments. The task was to make more accurate appraisals of proposals than could be achieved in that manner. This it did between 1954 and 1961, by which time overseas agencies and private companies wishing to make investments in India had generated much information, and so from 1961 onwards NIDC became advisors on plant design, identification studies, problem analysis and so on. Then in 1966 UNDP asked the National Industrial Development Corporation to undertake a survey in IRAN and thus they began to operate abroad and are currently sharing their knowledge with some twenty-seven other countries as far afield as South America. NIDC covers a wide range of interests and although its major interests lie in the engineering industries, they deal with things as diverse as forest products, etc.

2.3.33 Mr. Mariwalla believes that the relationship of industrial design to product development "is crucial". Without proper production technology, economic products are not possible. Technology that is derived from a preconceived product is unsound and furthermore the product choice is almost invariably inappropriate.

2.3.34 As an example he cited the two-wheeled motor scooter. The private sector introduced this machine from Italy but the cost of production of this sophisticated model was far too high even compared with production costs elsewhere in the world, and out of all proportion to

what the Indian market could stand. There was no significant improvement possible to the original design but the Italian scooter was not basically an appropriate product for India in its original form, e.g. it had a top speed of 70 mph but not ideal for Indian roads or Indian usage, which is primarily for use as transportation between home and office and the occasional weekend trip to the park.

2.3.35 To demonstrate this point, Mr. Mariwalla had designed and built a scooter with simplified transmission using an ordinary bicycle type dynamo and lamp etc. and proved that a suitable machine could be built for one third of the cost and using components readily available on the open market. From this study, attention was drawn to other existing products based on imported models which led to the establishment of a division in the National Industrial Development Corporation concerned with appropriate product characteristics. Just as important as the consideration of appropriate technology, which itself seems to be something of a growth industry!

2.3.36 Although primarily concerned with plant engineering, NIDC does become involved in industrial design and in the past has sought the assistance of the National Institute of Design, Ahmedabad, and proposed to continue and further develop this liaison in the future. It has also in the main been concerned with heavy industry in the past, but is now increasingly turning its attention to small scale industry, where it will also have a financing role.

2.3.37 As far as the views I expressed on industrial design were concerned - which was the tenor of my recommendation, Mr. Mariwalla's reaction was that of "couldn't agree with you more". He is quite convinced that purely mechanical design or styling were in no sense

real design. He summarised his views as follows:-

1. Awareness of design at all levels - ministerial, decision-making, management, shop floor - is vital. The true meaning of industrial design is not appreciated and this situation needs rectifying.
2. It is essential to illustrate and emphasise the economic advantages of good design.
3. Consultant engineering design practices in developing countries have devoted their time almost exclusively to plant engineering, which is natural - but these groups need to be indoctrinated with the need for industrial design.
4. The general policy-making system and infra-structure associated with science and technology needs to be involved in industrial design considerations and the Industrial Research Institutions need to combine their considerations in their research and development programmes.

In conclusion, since most developing countries have mixed economies, it is of the greatest importance to satisfy the producers that they will be the beneficiaries of industrial design initiatives, and Mr. Mariwalla's concluding remark was "I think industrial design is crucial and vital".

2.3.38 Before leaving India for Pakistan on Saturday the 11th March, notwithstanding that it was the "second Saturday", I had a meeting with Mr. Romesh Thapar who is one of the real intellectuals and thinkers on the subject of design - and has been a powerful force behind the National Institute of Design.

2.4.1 Whilst industrial design is not an exclusively visual matter, nevertheless visual aspects play a major rôle

in the appreciation of design. No investigation of the state of design in a country would therefore be complete without taking into account the visual awareness of the people of that country. This is apparent from the architecture and their homes as this is where people reveal their full visual character.

2.4.2 In the historic past, the visual and cultural gap between the architecture of government in the form of, say, the works of Shah Jehan, and the ordinary people in their primative huts was enormous. Today the buildings of government and people vary only in scale - visually both are, in the main, universally awful.

2.4.3 During my stay in India I specifically visited a number of private homes. The flat in a modern multi-storey block in a busy part of Bombay of a senior business executive with a wife and small daughter. The home of the director, single, of the National Institute of Design, who lives in what was formerly the guest house on the campus at Ahmedabad, a spacious house on two floors. The Delhi house, rented, of a prominent lawyer in the Supreme Court and his wife who runs a small scale export garment manufacturing enterprise. The home of a government officer with grown-up son and daughter, whose wife is a school teacher, senior grade, in a modern suburb typically middle-class, built since independence. The home of an intellectual with a fine detached house in a fashionable suburb, the owner's study having a good library and many art works including sculpture in the garden, both western as well as eastern.

2.4.4 I also visited a lower-middle-class home in one of the new 'colonies' on the outskirt of Delhi which is expanding rapidly - this was comparatively small for the family it contained and was similar in style and finish

internally. It had its own hand-operated water pump in the enclosed open rear area as the local water supply is intermittent.

2.4.5 All the houses had refrigerators, television sets and hi-fi systems of one sort or another. The latter and a similarly slightly larger house I saw in the same colony having the TV set housed in a wooden display case not unreminiscent of a shrine - decorated with Hindu tracery and serving also as a display cabinet for small treasures.

2.4.6 The general poor level of finish even in the better-off people's homes is a factor that must be taken into account in terms of design improvement. The external appearance of the lower type of house - bearing in mind that the term is relative where shanty type housing is rife - is inclined to the bizarre. The natural exhuberance of the Indian and love of intricate decoration and ornamentation produces startling effects when an attempt is made to use "modern" construction methods, utilising low-skilled labour. Again this is a factor that produces a general visual environment quite different to that considered in areas of "good design". Buildings therefore range from the tent or shanty at one end of the scale, through the mud dwelling and more traditional forms of construction, to the "art-deco'" type housing of the new colonies, the slightly (but only slightly) more restrained forms of the better-off suburbs to the utilitarian and weakly designed modern office buildings and thence to the glossy international style showpieces of whom anyone could be proud - if that is what is needed.

2.4.7 The ordinary level building shows a failure to grasp the more scientific aspects of simple modern building techniques as distinct from well tried and tested traditional methods. Hence the universal damp walls

which seem incongruous in this region. It was not appropriate, neither was there time, to make an appraisal of building methods but the design need seems to be just as great here; could it be that attention is given only to the more grandiose and status-symbol projects? Something ought to be done about the investigation and use of mud as a building material, certainly if any serious attempt is to be made to alleviate the housing problems of the poorer classes. My own experience is that as a building material it has many advantages over many more 'respectable' materials - the idea for the use of which was in many cases imported - this again raises the matter of appropriate product and appropriate technology. The design of buildings as far as weathering is concerned leaves much to be desired generally. Presumably the inability of buildings to dispose of rainwater efficiently and adequately leads to the rapid acquisition of a particularly unattractive, dirty-looking patina which gives a generally run-down and depressed air to most new buildings. These are all factors in the visual awareness game in which design is involved. It seems strange at first sight that a country with such rich and varied visual traditions from the past, which has produced such subtle and intricate forms of music and dance, could tolerate this crudity of visual surroundings. But is it not caused by the inability to handle imported concepts and materials?

2.4.8 Another, rather obvious, design feature that I noted was the lighting of the interiors of buildings. In the majority of cases the artificial lighting was harsh and not acceptable by Western European standards. Bright glaring light sources with strong, contrasting harsh shadows are characteristic and whilst this may be due to a lack of sensitivity, due to exposure to extremely bright external sunlight, it may also be due to a lack of sufficient illuminating engineering knowledge and experience. This is part of the industrial design scene as both the design of lighting

fittings and their environmental application are involved.

2.4.9 The status symbol approach to values endemic throughout the whole world is probably more disastrous to developing countries than anywhere. Appropriate products and appropriate technology freed from such misguided thinking is essential if any real, visible progress is to be made in improving the lot of the mass of the people.

2.4.10 This perhaps could be a main aim of the proposed UNIDO/ICSID conference in India at Ministerial level - the declaration that the developing countries will put people's needs first.

2.4.11 After that ICSID/UNIDO co-operation must be to seek out real problems where real assistance can lead to positive results. Reports must not be left to lie on shelves and gather dust, and the offering of awards and holding of exhibitions and seminars must be carefully considered. One good successful case history is worth a million words, spoken or written.

2.4.12 Two institutions offer sound bases for future development: the Industrial Design Centre, which is part of the Indian Institute of Technology, Powai, Bombay, and the National Institute of Design, Ahmedabad. The former is quite small but well run and Prof. Nadkarni who leads it is sound and enthusiastic and wholly co-operative. It is part of the conventional educational establishment as distinct from the National Institute of Design which comes under the Ministry of Industry. This has advantages as far as academic control is concerned, as they are free from the conventional attitudes imposed by educationalists. Ashoke Chatterjee is a man of considerable attainment and wide experience. He is not a designer as such

but has a sound knowledge of design and great discernment in matters of design. I had ample opportunity to evaluate his judgement on all aspects of this during our many talks and visits. He is the ideal man to be Director of this Institute and the sort of person to guide the faculties which suffer from the almost inevitable narrow attitude of specialists - although I found the members of staff to be far more open-minded than most I have met. I stressed the need during my talks for greater involvement with industrial processes - particularly production and the development of the product beyond the prototype stage and the marketing problems which are an inescapable part of industrial development if it is to succeed. This line was strongly welcomed and supported by Ashoke Chatterjee who thinks along similar lines, and so I was in fact reinforcing his views.

2.4.13 All meetings were well attended and punctual, and of the other Indians I met, from the most senior Government administrators, through the representatives of the manufacturers' associations, chambers of commerce, industrial enterprises, both large and small, and down to the stallholders in the open markets, I found all to be good-humoured, open and frank, prepared to talk openly about their problems and to listen to explanations as to the part that industrial design could play in future development and the rôles that both UNIDO and ICSID might play.

2.4.14 There seemed no unwillingness or reluctance on the part of anyone to try and find ways of improving the situation, and a remarkably realistic approach to life appeared to be shared by all. Naturally much of what I had to say was new to them, but the understanding seemed to be real enough. Of the information I was given and facts I was supplied with, all cross-references were positive and there was no conflict.

2.4.15 My considered opinion is that a very favourable climate exists for the implementation of new proposals, with the Indians themselves shouldering the major part of the burden and costs, and relying on UNIDO/ICSID mainly for expertise and, where necessary, the initial impetus to get things started, which otherwise might not be realised due to normal administrative and sectional interest problems. Selection of programmes must, of course, be done with care - the initial object being to gain the maximum effect and success in the shortest possible time.

2.4.16 Effort should therefore be concentrated and not dispersed over too wide an area. The selection of people of the most suitable type of background and temperament is, however, vital to the success of this new initiative. There are far too many examples of past unsuccessful "co-operation", possibly due to a fundamental lack of understanding of the real needs of the country.

2.4.17 Three papers are quoted here as relevant to the object of the mission:

Paper 1: Prof. Sudhakar Nadkarni - "Identification of Design Problems in India"

Paper 2: Shri Ashoke Chatterjee - "Developing a Strategy for Mass Communications in India"

Paper 3: Shri Kan D. Mariwalla - "Product and Process Designs: their Availability for Indigenous Production in Developing Countries"

PAPER No. 1:

IDENTIFICATIONS OF DESIGN PROBLEMS IN INDIA
by Professor Sudhakar Nadkarni

Twenty-nine years have passed since India became independent. Before independence the mood of the younger generation was entirely concentrated on achieving full political freedom. After achieving independence we had a new generation of Indians on the scene. Their aspirations enshrined in the constitution became the keynote of the conception of their birthright and their birthright was total welfare. Today, they are keen to see an all-round national development.

India has a population exceeding six hundred million, spread over an area of 326,800,000 sq. kilometres. Of this only 18% is urban, while the rural population is distributed in more than 567,000 villages. The general literacy rate is around only 25%. The income of at least 33% of the rural population and 50% of the urban population is below poverty level.

Since independence India has made impressive progress in the industrial sector and its net output has risen more than fourfold over the period 1947-74. The progress made has been even greater when judged in terms of the range and sophistication of the products manufactured.

But in spite of this magnificent technological achievement, endeavours to reach the poor have not been successful. An eminent scientist, K.N. Reddy, points out:

"Western technology has buttressed the polarisation of Indian society with a small, comparatively rich, acquisitive, conspicuously consuming, politically powerful, city-centered elite, drawing its ideas and values from the West, and a large mass of poor people left out of the circle of production and consumption by lack of employment and purchasing power. "

If real democracy means the well-being of the majority, we cannot afford to forget Gandhi's accent on developing the village economy and the importance of spending a considerable part of our resources on medium and low-technology items which will prove the poor rural masses with the minimum needs of survival.

Our discipline demands a certain conception of human values in which technological and economical values are supreme along with cultural values. Therefore, I have aimed at rural India to pave the way for economical and technological changes of a certain type. I would refrain from enforcing the stamp of an urban elite or industry-based cultural norm, with their inherent concepts of functionality and aesthetic value, on the problems of rural design. When people are hungry, the immediate pressure to find an earning opportunity is far greater than the effect of promises, even in the near future, of earning and stability.

The introduction of new technology in rural areas is itself no solution to the problem of rural poverty and unemployment. What is needed is an integrated programme of rural development. Non-agricultural development and the growth of social and cultural services are as important as agricultural development.

The emphasis should be on a programme of co-ordinated agricultural/industrial development. This could include diversification of agriculture, rural public works, setting up agro-processing industries and local manufacturing units for the supply of inputs, decentralisation of light industries to rural areas and provision of trading, banking and social service facilities.

Furthermore, the prime necessity in rural areas is the creation of jobs in order to integrate the population in productive activities. One of the main possibilities is through design input, of whatever type. New activities can be generated through design input, adding value to the local resources. The added values can be retained in the area to increase the income of the population. Such activities should have a relatively simple technological base so that the educational system can generate the skills required. increasing the number of trained people and, thereby, the local production base. The education-cum-training base should be made as self-reliant as possible by training local people who will subsequently train others. The whole economic-cum-education effort should be self-governing and self-regulatory, perhaps through co-operative organisation.

With the introduction of new designs, including art and craft activities, a number of allied trades can provide better employment opportunities. Take for example, trades like textile dyeing or weaving. Weaving, dyeing or stitching can be taught to others. A textile designer who can advise on new designs, prints or patterns is usually conversant with manufacturing and processing techniques and can pass on his know-how to create new trades. The same will be the case with any other design input such as pottern, toy or tool making.

The end result of the design input should be the development of products. Whether they are agricultural or not, the products should be such that the community itself can make, use, and earn from them. Here the designer's scope is not limited to designing products. He may also design the simple tools to manufacture the products. To avoid exploitation by the middle man or the employer, the design development activity should be a self-generating process through co-operative means. The designer himself has to take the responsibility of training the illiterate and semi-literate rural masses.

It is very important that the designer becomes part of that rural society, to win their confidence. He cannot do this alone. He has to take the assistance of other experts, such as economists, sociologists and administrators. It is absolutely necessary to create confidence amongst the local people and the politicians to speed up implementation. The designer has to recognise that the sense of traditional values is very strong among the rural millions. He must also recognise that folk art and craft are created by indigenous designers and artists who are no less creative than the modern urban designer. When the conventional designer tries to bring to them the benefits of his better-informed and more analytic mind, he will have to concede to them their aesthetic imagination and skill. Thus, the designer working in the village area will have to keep in mind traditional and rural India with a view to synthesising tradition and modernity.

The creation of new employment potential with the introduction of design input will bring some technical and human constraints. Performance will depend greatly on the choice of technology. Preferences for technology and human resources whil working for a rural community are:

Approach to design innovation - capital saving and employment generating, rather than capital intensive and labour saving technologies.

Products should be manufactured in the cottage scale and small scale rather than large scale technology.

Consideration of simple technology and skills already available with the traditional rural craftsmen like potters, weavers, blacksmiths, carpenters, cobblers and tanners.

Preference should be given to local materials rather than materials transported from a distance or urban areas.

Production technology should be energy saving, rather than energy intensive - preference for locally made manure gas.

As the literacy rate is very low in rural areas, it is necessary to introduce design training at secondary school level for literate, semi-literate and illiterate people. In contrast to urban areas the material available is mostly natural and thus the choice is limited. The technological base is low and manpower is semi-skilled. Formal aspects of design play a secondary role. Unlike urban areas where the people are not prepared to settle for less if they can get the best, utility consumer goods are acceptable in rural areas.

The design process in urban areas starts from the briefing from the clients (the industries). In most cases data is available. A rural area, however, is entirely different in that the designer himself has

to select the problem, collect the data and find the solution through inter-disciplinary efforts. With this in mind, I suggest the following pre-requisites:

The designer's main objective should be creation of jobs by generating new design activity.

He should have first-hand knowledge of organisational structure (government, local government) and political groups in the area he chooses to work (and their sympathetic co-operation).

Collection of basic data on available natural resources, need-orientated analysis and evaluation, and finally, determination of end-use.

Work through institutions, government agencies, voluntary organisations or individuals. Gaining confidence of officials and political channels is essential.

As his living will depend on his design service for urban industries, he should be able to pay frequent visits to the rural areas of his choice (his semi-voluntary service).

He should be able to convince the villagers that his projects need their full participation and co-operation, as the villagers themselves will have to organise the scheme and pay for it.

He should also consult other experts connected with production, such as marketing personnel, economists, and bankers, and get their participation.

Once through the prerequisites, it is time for actual execution of the scheme. On starting the scheme, there are two possibilities of scale, each having specific qualities: Small scale; Cottage scale.

A small scale industry is one employing less than fifty persons, if operating with power, and with capital assets not exceeding Rs. 5 lakhs at the initial stage. On the other hand, a cottage industry is run wholly or partly with the help of the members of a family in whole or part-time occupation.

It is advisable to start the project on a cottage industry scale with five to ten villagers forming a co-operative society. Forming a society generates unselfish spirit, and the activity is conducted under democratic management. An isolated and poor individual relying on the mutual support of others can procure the tools and equipment, which are easily available to resourceful persons, and thereby develop himself to the fullest extend of his capabilities. Design inputs can be introduced in several areas:

Textiles	- design of simple looms.
Textile design	- dyeing and processing techniques
Woodworking	- products for everyday use, toys, furniture, agricultural tools.
Pottery	
Metal work	- design of domestic products.
Agricultural	- tools and transport.

In conclusion, I would like to reiterate what Gandhi said, "India lives in her villages, and if you want to improve her lot, you have to work with the peoole there and not merely for the people there" What I wish to project is that the designer should work as a member of the village community, and not serve as a feeder to the community. He has, of course, to enlist the co-operation of the various other agencies involved in the implementation of his project, taking into account the specific requirements of the rural community so that the output becomes the real in-product of the community.

PAPER No. 2:

DEVELOPING A STRATEGY FOR MASS COMMUNICATIONS IN INDIA

by Shri Ashoke Chatterjee

"The paramount requirement of change in any society is that the people themselves must change"

THE TASK

We have set ourselves the gigantic task of creating a future of our choice; of suggesting alternative futures, of persuading planners toward certain choices, and then of motivating millions toward a future of their choosing, of equipping them with the new attitudes and new skills essential to its realization. If social change of this magnitude is to take place within a democratic framework, the communication task is to inform, persuade and educate for change. Only mass communication can carry information at the rate required to meet such targets. The required inputs of information and learning are so vast that mass media, intelligently used, must perform as a great multiplier of information and as a dynamic extension of formal education. Apart from communicating information, the task is also one of stimulating action and of sustaining it. We must therefore be equally concerned with the psychology of perception and motivation as with technologies of communication, data storage, retrieval and dissemination.

While few answers are available today to the questions and challenges which are raised sporadically by communicators across the country, a consideration of

their concerns may assist in planning communication strategies and investments over the next three decades. The professional communicator - journalist, photographer, film-maker, designer, printer, teacher, radio or television producer - is at a disadvantage in predicting a future role. He has little to guide him in understanding his present status, leaving alone in projecting his future. Professionally, we may be skilled but our understanding of the changes we create is limited.

THE NEED: TWO-WAY TRAFFIC

If Indian communication is to modernize and energize, it must first be transformed into a two-way process, giving as well as receiving information and direction from those it is attempting to change. Our strategies must give equal emphasis to carrying the people's message to "us" as to carrying "our" message to the people. Communication as a round-trip ticket is a concept too little known, particularly in official experience. While the need to project messages outward is readily accepted, very little has been done to receive information from and about the audiences to whom messages are addressed. Therefore a prime planning task is to build channels of information downwards as well as upwards and laterally, so as to provide through communication a much wider participation than now exists in the processes of decision-making and policy formulation. Such a strategy must be the very foundation of our experiment. When we finally accept that communication is necessarily two-way traffic, can we also recognize that sustained dialogue is required between those who devise messages and those entrusted with the task of communicating them? This is not to suggest that mass media alone can change attitudes, skills and behaviour. It is rather to recognize that our objectives of economic and social development imply several tasks which are well within

the power of mass communication. We are concerned with the effective use of mass media as one important agent of social change. Mass communication can help teach the skills with which our people must be equipped if change is to be made possible. Information must spread if individual and national aspirations are to rise and opportunities and methods of change made intelligible. Mass communication can help sustain the dialogue between planners and people.

DEFINING NEEDS, FINDING TOOLS

Any communication plan for the next twenty-five years will need to focus on the messages that require priority communication over this span, as well as on the technology and hardware required for this purpose. Such a projection therefore demands some understanding of India's needs over the next twenty-five years in agriculture, industry, health, literacy and formal education. Although we may utilize present compartments to segment future communication needs (communications for formal education, for industrial training, for rural development, for health and social welfare, for advertising), major changes in communication needs and strategies within these sectors are already apparent. For example, the demands of 2000 A.D. will surely require very drastic revisions in our system of formal education. While acceptance exists that India's educational system must change, what about changes in media used for instruction? How is that to be transformed, and by whom? Or, what communication aids are required today to assist opportunities for teachnical training under the new 10+ 2 + 3 system? Communication may also need to be tailored increasingly to individual needs, toward adult education and to providing individual access to education as part of a life-long process. Such experiments are taking place in pockets of educational change through India, whatever attempts are made to take the classroom to the

to the street, to the workplace and to the home. It is these experiments which need the immediate participation of communicators.

There is today a global stress on local communications, from cable television in the United States to the wall posters of China. Yet organized media in this country is still almost totally ignorant of grass-roots needs. If change is to take place at this level, and if the motivation and means of change are to be made available here, then local communication and feedback must become the focus of our effort. Local radio stations, local TV, newspapers, wall papers, folk arts and innovation of these and other media to suit local requirements are the tools we must learn to understand and use. The recent SITE experiment underlines the need for multiple channels of communication which help the local citizen to adapt the information which reaches him through central media. Television and radio programmes must be supplemented by local posters, wall papers, travelling exhibits, domonstrators and teachers - devices which can transform the general into the particular. Mass media can go hopelessly wrong without such local support. And here we must squarely face the political issue: developing local media means placing media in the hands of people. Experience over the last twenty-five years indicates some difficulty in mustering the political stamina for such a move. Yet without it, communication cannot function as a great multiplier and will remain a one-way flow from the top.

It is here that we also need to look once again at traditional communication tools available in India. Our folk plays, travelling cards and minstrels, puppeteers and story-tellers provide rich resources for local communication. Available evidence of what can be done with such traditional media includes the

family planning communications schemes undertaken by the Advertising Agencies Association of India as well as Indian demonstrations at recent WHO and Habitat conferences. Financial investment would be minimal, the impact far stronger than anything mass media can achieve in its present state of ignorance about rural audiences, and a valuable part of our heritage could be saved from possible extinction. And communication would be back where it belongs - in the hands of the people, working with skills they have mastered over centuries. We must learn to use once again the bazaars, market places, festivals and places of pilgrimage as nodal points in our strategy. Communication discussions today are far too burdened by considerations of the latest electronic gadgetry and too little influenced by the realisation that India's prime need over the coming years will be simple, low-cost innovations to meet local and special needs. An "appropriate" technology is therefore relevant to Indian communications. Mass communication at the local level will also greatly depend on local facilities of roads, postal services, telephones, telex, rail systems and power generation. Prospects for such infrastructure and on understanding of their use must be integrated with any communication plan.

THE NEED FOR RESEARCH

Communication predictions require much greater knowledge than now exists of the psychology and sociology of perception in India. Without such understanding, attempts to create and sustain motivation cannot succeed. Futurology exercises in communication must, therefore, concentrate on filling great gaps in our knowledge. Some communication research has taken place in government and within the advertising industry. Valuable though it may be to bring these findings together, much of past research has been ad hoc stuff. The need is for new research investments in the dynamics of percep-

tion within our society. We need to establish a flow of information and opinion between groups of media-users as well as between audiences and those who direct media programmes and policies. "The appropriateness of information directed to the audiences of mass media depends on appropriate information from and about the audiences of the mass media. The quality of information from and about the audiences is of the essence." The cultural and informational gap between city and village, between the producers, purveyors and consumers of information is today so vast that audience reaction is rarely predictable. Only sustained communication research can keep pace with the diversity of our needs. If we truly believe that mass communication can assist social change, we must marshall our facts. Scarce resources should not be risked on inefficient campaigns. "Half measures are no more effective with mass media than with factories and dams." It is in this context that the evaluation exercise which now follows the SITE experiemnt takes on great significance. What will SITE tell us of the impact of television on so many who have "leap-frogged" over conventional media into TV, millions of whom have yet to learn to read and write? The SITE experiment highlights two important trends: one away from print into visual media, and the other from non-verbal (print) into verbal communication. What can SITE teach us about these processes? What does TV do to the literate receiver who is no longer required to read 'between the lines' or to create his own mental images? For the illiterate, what is the significance of this movement away from face-to-face, verbal communication into impersonal communication, verbal and pictorial? Is credibility sustained or altered? Are we entering an era where speech and face-to-face communications will be as important, if not more important, than print and radio? Will this bring with it greater attention to, and revival of, our oral traditions?

Or to more discerning use of language? What is the impact we should anticipate of the spread of Hindi, and therefore of increasing bi-lingualism, on mass communications throughout our land? How will society respond to the transfer of prestige and power from traditional sources of information (the village school teacher, priest or headman) to new and impersonal sources of information? What is the impact in our society of the "shared experience" of television? Are we Indians any closer to becoming one family after SITE? How can India mould its communications to act as an incentive for participation, not alienation? Has the communications technology which we are adopting today taken other peoples away from their essential roots? If so, why? We may learn something from western experience, not as providing Indian answers but more as an "early warning system". "If there is a single phenomenon which vitiates this turbulant thrust in future, it is the manner in which modern development - economic, political and social - has but or reduced or distorted the participative dimensions of culture... This major phenomenon of our times, the root of our alienation, is never focussed upon... we are becoming viewers of culture, unable to comprehend its deep significance to living in a world increasingly influenced and moulded by science and technology. We are forgetting that participation is the key of cultural communion and upliftment."

It may be useful to study such contemporary developments as the film poster, surely the most ubiquitous and effective outdoor media we possess. A whole idiom of mass communication has developed here which, whatever one may think of its aesthetics, is uniquely and effectively "Indian". How did it get that way? What are its lessons?

BUILDING A PLAN

To articulate a strategy for communicating messages demands that we make adequate provision for the media required to put such a strategy to work. What are the communciation tools we now possess, and what are the tools we will need to help create the future of our choice? The immediate task is to build a communciation plan which could help forecast requirements over the next two Plan periods and, simultaneously, over a longer span: an anticipation of communication support systems for agriculture, industry, health, literacy and formal education. What do we need in terms of books, films and radio programmes, printing presses, newspapers, photographs, to meet development tergets? One way to start is the yardstick suggested by UNESCO for measuring the adequacy of mass communication facilities in developing countries: for every 100 inhabitants, ten copies of daily newspapers, five radio receivers, two cinema seats and two television receivers. Or perhaps we should develop our own standards by requiring agencies responsible for executing development plans to formulate statements indicating their present and future media requirements. For example, to achieve its current targets of family planning - a reduction in the birthrate from 39 per 1000 in 1969 to 25 by 1983-84, and to protect four crore couples in the reproductive age group through any method of family planning - what does the Ministry of Health require over the next five to ten years in terms of films, film projectors, photographs, leaflets, posters, hoardings, books, training aids, travelling exhibits, folk media and so on? Such an inventory would lead to estimates of likely investments in new and improved facilities, equipment and support services, raw materials (newsprint for newspapers or raw film for photographs and motion pictures), organizational inputs (such as distribution systems for audio-visual material or field units for the new rural science centres), training programmes and in communication research. Such

estimates can help set targets for investments in industries which service the communication sector. This is a planning task never attempted for Indian communications, and one which the current exercise in futurology gives us the opportunity to commence.

The absence of a plan for Indian communciation is both the cause and the effect of a general reluctance to invest in communications, an apathy as apparent in the private sector as it is in government. The first budget which gets the axe in any financial squeeze (and there will be many between now and 2000 A.D.) is the communications budget. Yet cost-benefit ratios are particularly difficult in this sector. As Wilbur Schramm asks, "How does one value, in money, a better informed citizen? ... What is the monetary value of the mass media contribution to leadership?" The Indian experience is typical of the low priority most developing countries still accorded to communications, which is seen as competing for funds and not as a support for every development activity. It is the essential and supportive role of communications which most needs national understanding. This would be clear only if a basic mass communciation plan is developed which could clearly relate the development of information to other strands of development. The need. therefore, is to establish the links between mass media and balanced economic growth. A communication plan is the only way to demonstrate this essential relationship.

LOOKING AT MEDIA

Our planning exercise must provide basic policy decisions on the future of mass communication equipment and material. Communication industries must be given more respectful attention. We can no longer afford to treat media as casually as the printing industry has been treated in India over the last twenty-five years.

Yet Indian printing and publishing already reflect the impact of new technology. We see the "leap-frog" jump from hand-set types to photo-mechanical methods, skipping several intermediate stages. Computerised type-setters and electronic systems for block-making and photocopying machines are all in evidence. Even typography is beginning to reflect the demands of a new era, after centuries of letter-forms first developed for reproduction by reed pen and needle point. (Indian designers are now creating forms in all the major languages which can assist photo-graphic and mechanical reproduction, including computer print-outs). What prospect exists for greater decentralization of printing technology? How much paper, and in what specifications, will we require? Can we foresee low-cost printing at the village level? If so, what technology do we need? Letter-press and offset machines, type setting machines, duplicators and photocopying machines - basic equipment, requiring planned production. Are community-owned presses a possibility? Can one conceive of a low-cost book revolution, as Romesh Thapar has done, in which books sell like magazines? How else can books be made available to millions who become literate each year? What about technologies for wall papers and posters, independent of power-driven machinery, utilizing village materials, including mud-surfaced walls? Despite several decades of broadcasting experience, we have as yet touched only the fringe of the power of radio as an agent of change. We have yet to under-stand its potential, and to balance its power and economy - with other media investments such as TV. What will we require in terms of broadcasting equip-ment (receivers and transmitters), and what cost and price? Can the absurdity of radio licensing be abandoned finally? What is the policy toward pro-duction and pricing of cheap transistor radios? (One estimate of village demand for sets priced around Rs.100 is 40 lakh radios each year - but is Rs.100 "cheap"?) What policy decisions are ahead

for FM (frequency modulation) broadcasting, which is ideal for local reception? (There are reports of over one thousand new frequencies being available soon for FM broadcasts in India) The development of film and photographic equipment and materials requires a rational policy. Take the development of 16mm and Super-8 technology, or the provision of video-tape recorder (VTR) equipment - all three techniques are being used globally for classroom, shop-floor and grassroot instruction. In India, these are still novelties. By now, we should have mastered these tools and put them to work. It is not hardware alone we lack but the training essential to its use. For example, the Super-8 loop (the message contained in a few minutes of images without sound, to create a coherent and endless cycle of information) which is so useful for classroom and industrial training, demands a discipline very different to conventional film-making. It also requires inexpensive projectors and adequate processing facilities. (John Grierson had stressed its utility for India in a report to the Ministry of Health years ago) The 16mm film, now standard for most television and educational purposes throughout the world, is a totally (almost deliberately) neglected area of technology. No serious application of this essential specification for film-making or for TV is possible without efforts to upgrade and expand 16mm black-and-white technology. VTR know-how is another area of darkness for all but a very few, essential though this technology is to future development of television and to communication training. We have yet to select a national preference from the spectrum of VTR specifications available abroad. The absence of a national plan to integrate the scattered know-how in the audio-visual sector is a massive obstacle still awaiting official recognition of its existence. Speaking of television, we need first to assure ourselves that its massive capital investments

are essential to our plan. Next, we need to know how many sets we require, of what specification, and when. Will the manufacture and sale of television sests continue to be regarded as high-cost luxuries, while we simultaneously wax eloquent on the role of TV as an agent of social and economic change? What is the priority to be accorded to the development of television transmission: how much by satellite, how much by terrestrial station, how much by individual or local access through cable TV?

Inexpensive cassette tape-recorders must be available through mass production as a major educational aid. Scarcities of raw-film, photographic paper and magnetic tapes are other perennial headaches for the Indian communicator. Cameras and projectors, both still and motion picture, are a luxury. What is future policy to be towards developing indigenous sources of supply, and on imports? We cannot expect to keep abreast with the rapid development of photographic technology. Imports are here to stay. Can we develop a policy which will permit us to keep within the international mainstream, while protecting ourselves from the gimmicks of built-in obsolescence? How is the production of film, paper and tapes to be planned? Why are colour film and paper regarded as luxuries? Why do communication planners accept this? Who is setting the objectives?

GRAPHICS

Outdoor media (including posters, wall newspaper and the hoarding) could be major elements in our strategy if properly understood and intelligently linked to Indian traditions of visual communications. The languages of sign, symbol, colour and calligraphy are so rich in our country and yet so ignored by present-day communicators and designers. There is a need to study and understand the development of these resources if we are to build a language of communication relevant

to Indian needs.

Outside the larger cities and towns, Indian graphic design has contributed very little. The designer's major work is today in support of the advertising industry, still largely catering to the demands of an urban elite. Communication talent within this sector must be harnessed toward change: simple reading materials designed for rural communities, a variety of visual aids for home and for public places where they can "represent a continuity with the past and bold entry into the consciousness of the future. From posters to geometric images in public places, the range is wide. Whenever these aids have been used, they have renewed sensitivities and highlighted the vulgarisations. The experience covers backward, developing, semi-developed and supposedly developed societies. Now that environmental needs have found a permanent place in public consciousness, it should be easier to point to the role of visual materials and call for concerted action".

Skills in modern graphic design in India are primarily influenced by the experience of Europe and the United States, and confined to commercial communications. An Indian idiom of graphics, suited to new technologies and influenced by the rich resources of our past, is yet to develop, Considerable research is required before such a marriage can take place. Computer graphics, with its important implications for training and education, is another new chapter opening with current experiments in research laboratories. The future of such specialized applications must be charted with close consultation between communicators and scientists.

Graphic skills have yet to influence the dismal flood of educational material churning through our schools. Graphic designers are today quite outside the sector

which should represent their most substantial area of contribution: education and training. Charts, maps, graphs, exhibits and demonstration aids are an area in which the designer has much to learn from tradition, for no machines or electronic devices are required. Text books require the printing press and represent the strongest case for getting graphic designers more actively involved with changing needs in education. Where machines assist seeing and listening, we introduce the entire gamut of audio-visual aids. Here the best Indian expertise is to the highest international standards, but today it touches only the fringe of our needs. Programmed instruction through machines (including the computer) has made its appearance on the Indian scene and represents another new area of training and work for the designer.

The advertising industry has many lessons to teach the Indian communicator. It is professionally the most skilled and best organized sector of Indian communications. Communication strategies within the advertising industry reflect the growth of the language press, of commercial radio, of television and the use of marketing skills in small towns and rural areas. Experience such as the recent campaign for family planning organized by the Advertising Agencies Association of India (AAA of I), and earlier agency-conducted campaigns of Nirodh and for nutrition, are invaluable to an understanding of the current communication challenge. The variety of situations in which Indian advertising has gained experience in this century is a resource for the future. Through organized data and case histories some of this experience must be made available for educating tomorrow's communicators. There is a strong case for involding professionals from this sector in the task of planning a future for Indian communication.

THE NEED FOR SYSTEMS

India's advertising experience can also help us to understand the importance of developing communication systems, and not media alone. Our real concern is with the combination of messages and channels of communication: combinations arranged in an order of priority to meet future objectives. We should be concerned less with media mechanics than with understanding how change can be brought about. Systems that assist change require feedback and dialogue between planners, communicators and people. In short, systems require research. Without continuing communication research, all effort to use mass media intelligently is doomed to frustration. Investments in hardware, rather than research, may often appear easier to comprehend and implement. That would be the quickest way to ensure that muddling through becomes our choice for the future.

TRAINING

Training is vital to a communication strategy. Professional competence is so lacking today that it would spell disaster to turn over a carefully planned communication strategy into untrained hands. Facilities for training in mass communication are pitifully inadequate. We need to identify the institutes and organizations which can be made responsible for developing programmes or professional education for technicians, designers, writers, printers, broadcasters, production and management personnel. Communication training inputs must be available for teachers, administrators, and field workers at every stage of communication cycle. Budgeting for this infrastructure of education and training must form a major component of the planning endeavour.

CONCLUSION

Many more questions have been raised than can be

answered in this attempt to list some of the considerations which impinge on developing a communication strategy for India. The sheer complexity and range of this list of unanswered questions make it impossible to suggest a strategy with any confidence. What is possible now is to bring together the experience available in India, to begin the planning that can lead to strategies for the future.

"We do not lack messages or the ability to design them. What we lack are the necessary channels of communications. And even where they exist, they are urban, apart from radio perhaps. This does not even begin to meet the needs of the country. India confronts a crisis of communication today and I want to emphasize that this may be our only crisis. The quality of the planning at the top is not bad; the vision and the sophistication are adequate. The problem is: how do our objectives filter down through the enormous layers of governmentalism to those they are meant to reach? This is the current dilemma."

APPENDIX

MASS COMMUNICATIONS: A POSSIBLE LINE OF ACTION

1. Government takes a policy decision that Indian communications must be transformed into a two-way process. Bringing messages from the people to the planners is to be given equal status with the traffic of messages going outwards from centres of authority. Such a policy will necessarily assume that future Indian communications will be far more localised and participatory.

2. Under the aegis of the Ministry of Information and Broadcasting and the Planning Commission, a national communication plan will be formulated, based on clearly articulated statements of present and future communication needs by central and state agencies responsible for executing development targets. The private sector would be encouraged to undertake a similar exercise in communication needs. This massive undertaking could be based on the model suggested by Prof. Wilbur Schramm. The UNESCO model could also be used to check communication targets indicated by such a plan.

3. Work on the development of a communication plan would be indicated by a core group comprising experienced, professional communicators drawn from within as well as from outside official media.

4. The communication plan would help establish targets of production for essential raw material and equipment, for incorporation in future Plan production targets.

5. The communication plan would include major provisions for communication research and for training by AIR, Films Division, DAVP, Door Darshan, SITE, by the newspaper and advertising industries, and by educational institutions. Specific areas of priority research would be indicated in the Plan.

PAPER No. 3:

PRODUCT AND PROCESS DESIGN: THEIR AVAILABILITY FOR INDIGENOUS PRODUCTION IN DEVELOPING COUNTRIES

by Shri Kan D. Mariwalla

1. INTRODUCTION

In the past, considerable attention has been devoted to establishing production facilities in developing countries for the manufacture of end-products where demand volumes justify complete plants or a whole line of production. There is, however, a vast field of industrial products where the demands are, and will continue to remain, limited for many years to come. Except in a few cases, such items are not readily being taken up for production. On the other hand, it is known that capacity exists in a variety of manufacturing units where such end-products could be taken up for production without major investments, provided the designs and production technologies could be otherwise made available.

Then again, there are many cases where necessary know-how and facilities for plant design and construction are now indigenously available but recourse continues to be taken to foreign assistance in these fields also in the belief that foreign parties would not be willing to provide only the documentation relating to designs and technology. Frequently foreign sources of such documentation are averse to giving it for fear of its subsequent use without adequate remuneration to them. If however such documentation is obtained on properly agreed commercial terms, indigenous know-how can be utilised to a large extent in the matter of plant design and construction.

One of the important aspects which influences the planning of a project and subsequent production is the Methodology of Production. Methodology of Production can be broadly divided into three main aspects:

i) product design;
ii) process design;
iii) production technology.

The design of product and/or process fundamentally influences production technology and consequently the entire concept of the proposed plant. While the general aspects of plant design and construction - including production technology in many cases - can be provided by a Consultant Engineering Organisation, the specific aspects of product design and process design have to be provided by a specialist organisation.

Hitherto, in most cases, where foreign technical collaboration has been sought, all aspects of product and/or process design, production technology and plant design have been obtained from external sources. With the gradual build-up of consultant engineering capacity in most of the developing countries which can undertake plant design work, and the availability of manufacturing capacity to handle small volumes of production in specified fields, the stage is set to determine the most suitable manner in which the Methodology of Production can be made readily available to those in need of it.

This note discusses the various aspects of product design, process design, production technology and the most suitable manner in which these can be inducted into the country for subsequent use by indigenous manufacturers.

2. METHODOLOGY OF PRODUCTION

Before proceeding to a detailed analysis of the manner in which Methodology of Production can be made available to indigenous producers, it is desirable to define the various aspects of such methodology.

Product design

Product design provides the details of the final product along with the details of all its constituents, specifications of raw materials used, etc. It is the basic information for the production of any item which requires any form of machining and forming and furnishes sufficient details to enable the evolution and preparation of production technology.

Process design

Process design relates essentially to industries where during the manufacture of a product, the chemical and physical properties of the inputs undergo changes generally involving chemical reactions. Process design lays down in detail the physical and chemical state of all raw materials at input and at each successive stage of operation either for each individual raw material or their compounds, up to the stage of final output. It thus provides the basis for design of necessary equipment and evolution of the production technology which will ensure conformity to process conditions laid down for the various stages.

Production technology

By definition, production technology lays down the manner in which production of the end products is to be achieved. It, therefore, covers the aspects of choice of production equipment and machinery, assessment of input quantities, evolution of operation timings and their successions, etc. It also defines the manner in which raw material flow is to be achieved, particularly in respect of products involving general

process of machining and forming.

Methodology of Production

In evolving the Methodology of Production for any given product, all the above aspects need to be taken into consideration. While in all cases production technology has to be developed, the extent to which product design and/or process design influence the solution depends upon the end product.

Illustrative examples of the above aspects are given in subsequent paragraphs.

End products such as machine tools, industrial machinery, instruments and gauges, electronic instruments, domestic appliances, etc. are examples where product design and production technology would be required for the evolution of plant design and subsequent operation.

Chemical and metallurgical products such as sulphuric acid, soda ash, fertilizers, pig iron, aluminium, etc. are examples where process design and production technology are necessary for the development of a new production facility and its subsequent operation.

Ferrous and on-ferrous castings are classic examples of products requiring product design, process design and production technology for the design and establishment of new foundries.

By and large two alternative means can be adopted for making available the necessary Methodology of Production when production of a new item is to be established. These are:

i) by evolution of the design and process, etc. through research within the country itself; or

ii) by adaptation of existing designs and processes - whether indigenous or foreign - to the specific needs of the case.

It is important to remember that in most cases where product design, process design and production technology are inducted - particularly from foreign countries - maximum possible economies and efficiencies can only be ensured by a thorough review and necessary modification in advance, of such designs and technologies so as to ensure their suitability for prevailing conditions. For example, the adoption of a product design developed to suit mass production techniques will necessarily and avoidably result in lower production efficiencies and higher production costs if subsequent manufacture - condition by demand - is on a batch production basis. Similarly, the adoption of a process design involving a variety of chemicals, etc. which are not available within the country, without first determining the possibility of substitution with locally available materials, would result only in a continuing dependence on external resources.

It is highly important, therefore, that whenever such designs and technologies are obtained from external sources, they should be thoroughly examined and suitably modified for adaptation to local conditions. In many cases this would require research and prototype tests before the modifications can be adopted with confidence for large scale commercial application.

3. MODUS OPERANDI

In most industrially advanced countries, industrial enterprises have adequate technical and financial resources to sustain research and design development facilities necessary for taking up the production of

any new product. In developing countries, on the other hand, except in a few cases, most industrial enterprises have not yet reached the stage where they can allocate adequate technical and financial resources necessary for such work.

It has, therefore, been recognised that during the period of industrial development, it will be necessary to supplement these resources so that the rate of development of such resources can be speeded up. The most satisfactory manner in which this can be done is to attempt to centralise the work to the extent possible, bearing in mind the special conditions of the wide spectrum of industrial products.

The various steps which have to be taken before a usable Methodology of Production can be made available would include:

i) identification of product and/or process;
ii) location of sources of availability of necessary documentation;
iii) procurement of necessary documentation;
iv) technical examination of documentation;
v) research and development for modifications;
vi) compilation of revised Methodology of Production;
vii) codification and documentation for distribution.

The functions of these steps and the types of agencies in a developing country best suited to undertake them are described in subsequent paragraphs.

Identification of product and/or process

Necessarily, the first step is to identify the specific product for which the Methodology of Production

should be made available. The identification process will involve not only a thorough knowledge of present demands and future projections of requirements, but also full information relating to existing production facilities in the country and the extent to which similar products are already being produced indigenously.

Obviously the work of identifying the products can therefore be undertaken satisfactorily only by a Central Agency involved in the industrial development of the country and which in the normal course of its functions, is fully conversant with the present industrial position and the various aspects of future developments.

Location of sources

Having identified the product and/or process for which Methodology of Production has to be made available, the next step would involve locating a suitable source from which such documentation can be obtained. This would involve not only a detailed technical examination of the product and/or process concerned, but also negotiations on the commercial aspects of such transfer of documentation. This would necessarily be a fairly laborious task as various alternatives from different countries - and in some cases from within the country - would have to be studied in considerable detail.

The most satisfactory manner in which this can be done would be for the Central Agency to assign this work to an organisation in the country which is already familiar with similar products and/or processes and which has the necessary technical personnel to make a thorough review of the alternatives. For example, if a particular type of machine tool such as a special lathe, is involved, the work of locating the most suitable source

for obtaining the necessary documentation relating to Methodology of Production, could be an organisation specializing in machine tools. Their intimate knowledge and experience in production and operation of machine tools, would be useful in determining the relative merits of the alternatives offered.

While such an organisation would be expected to locate a suitable source, it would be desirable for the Central Agency to be fully associated with it during its technical and commercial investigations. The concerned organisation referred to above is termed as the Operative Organisation subsequently.

Procurement of documentation

Once a suitable source has been located and the commercial negotiations completed, the Operative Organisation appointed by the Central Agency for this purpose would procure the documentation for subsequent use in the country. This Operative Organisation would then become the custodian of such documentation and the agency for its subsequent commercial exploitation in the country.

Technical Examination

As has been discussed earlier, every product design and/or process design inducted from other sources, particularly from abroad, would have to be very carefully studied. Such a review would have to be made not only from the point of view of end-use adaptation but from the point of view of volume of production and consequent methods of production to be adopted as also the possibility of substitution of raw materials which have to be imported by those indigneously available. Such work can only be undertaken by an organisation which has a well developed design office where such a detailed design review can be made. In selecting the Operative Organisation for each particular case, there-

fore, the Central Agency would have to bear this very important and essential pre-requisite in mind. Fortunately, necessary facilities are being built up in most of the public sector undertakings and specialist organisations in developing countries. Many of the large public sector undertakings can, therefore, be used as the agencies for their respective fields. For this work also it would be extremely beneficial for all concerned if the Operative Organisation avails of the collective expertise of Central Agency and its various Councils.

Research and Development

After the inducted documentation has been studied in detail, it would be possible for the Operative Organisation to define the specific aspects of design, raw materials and processes which would require modifications and alterations to suit prevailing conditions in the country. Once these specific problems are identified they could be passed on to organisations which have the necessary research facilities for such work. The latter would in most cases be the research laboratories and in some cases would also be large manufacturing units which have research and experimentation facilities. For example, if occasion arises for obtaining the design of a particular type of electronic instrument and study of the designs subsequently indicates the need for research and prototype testing to avoid the use of imported materials and components, etc. Such work can be undertaken by the electronics laboratores, where such facilities for experimentation and prototype development are available.

Finalisation of Documentation

Once the research and development work which may, on occasion, involve manufacture of prototypes and their extended testing, has been completed, it would be for

the Operative Organisation to revise the product and/or process design etc. in a form in which it can thereafter be handed over to intending users. This again will involve a considerable amount of design office work and the Operative Organisation selected shall necessarily have to have adequate facilities.

It will also be the responsibility of the Operative Organisation to periodically review the documentation held by it in the light of subsequent advancements and changes taking place in the country and to ensure that revisions and modifications are incorporated taking note of such developments.

Distribution

Once the documentatation has been finally compiled, the Operative Organisation would then retain it for subsequent commercial exploitation. At the same time, it shall provide copies of such documentation to the D.G.T.D. so that the latter are fully aware of the availability of such documentation. This is considered vital since whenever a new production facility or programme has to be taken up, entrepeneurs invariably have to route their proposals through the D.G.T.D. who can guide and advise them on the availability of such documentation as also the source from which this can be obtained.

The afore-mentioned procedure would be the most satisfactory one as it will ensure the following results:

i) Identification of correct items by those who know the needs of the country best. This will avoid the possiblities of infructuous expenditures which may result if products are identified without due regard to users, immediate and future needs and available production facilities in the country.

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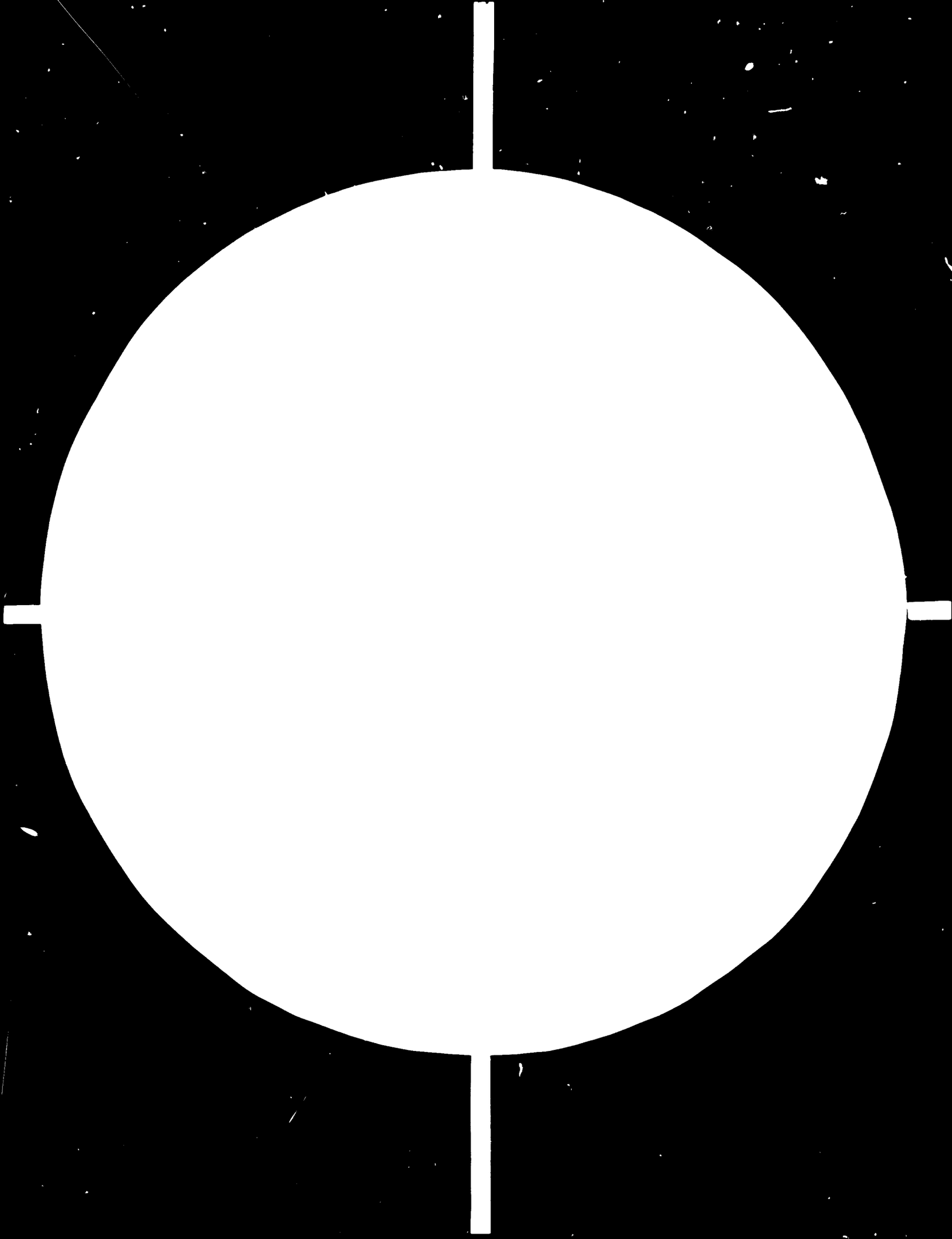
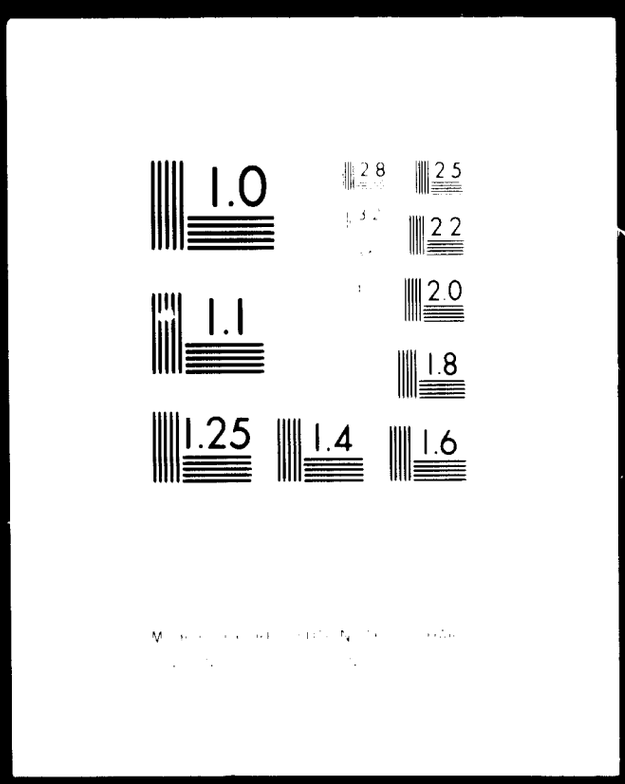




ii) The Operative Organisations entrusted with the procurement of documentation of Production Methodology would be those who have adequate technical and design office facilities for undertaking detailed technical examination of the production methodology, and initiating work relating to adaptations and modifications thereof.

iii) The agencies for research and development work would be organisations such as the research laboratories or the research and development departments of manufacturing plants. The assignments entrusted to them for developing modifications of existing designs or an entirely new concept and building prototypes is precisely the type of work for which these organisations have been set up and can be utilised to optimum advantage.

iv) Work on procurement of necessary documentation can begin forthwith, as concerned organisational facilities already exist. Marginal adjustments in individual organisations will not involve anywhere the same amount of time, labour and money as would be the case if one or more separate organisations were set up specifically only for this purpose. This is an extremely important point, as time is of the essence.

v) It would avoid duplication of work - particularly in the field of basic studies relating to present and projected user requirements.

APPENDIX A

INDIAN MERCHANTS' CHAMBER

List of Organisations and Government Agencies represented at the meeting held on the 28th February

Industrial Development Bank of India, Bombay

State Industrial and Investment Corporation of Maharashtra, Bombay

Maharashtra State Financial Corporation, Bombay

Industrial Credit and Investment Corporation of India Ltd., Bombay

Indian Institute of Packaging, Bombay

National Institute of Design, Ahmedabad

Bombay Chamber of Commerce and Industries

Maharashtra Chamber of Commerce and Industries

Bombay Productivity Council

National Productivity Council

Directorate of Export Promotions, Government of India

World Trade Centre, Bombay

APPENDIX B

A POINT OF VIEW
by the Society of Industrial Designers of India

SIDI, a body of professional Industrial Designers, welcomes you on your important mission of identifying the needs of industrial design profession in developing countries. As practising professionals we like to put forward our views, which may be of assistance in your mission.

In India, industrial design has taken roots through educational and practising institutes like National Institute of Design, Ahmedabad, and Industrial Design Centre of the I.I.T. Bombay. Though these institutes may need help from UNIDO for further training facilities, we can say that they have achieved a certain standard in their main objective, namely 'Education'. What needs to be tackled is the next task of design survival - 'Propagation'.

An overall assessment from SIDI members indicates that hardly 50% of trained industrial designers are employed as industrial designers. And amongst these employed as industrial designers only a small number are engaged in full-time industrial design work. Many come across industrial designing only 20% of their time. This indicates that a lot needs to be done in convincing the industries about the use of industrial design. Though NID and IDC are trying to do something in the matter, it is hardly a function to be carried out by educational institutions. We feel that creation of a 'Design Council' with following main objec-

tives would be an answer to this problem:

1. To propagate industrial design through exhibitions.
2. To run a magazine of industrial design.
3. To subsidise the approved industrial design projects undertaken by the industries.
4. To help the placement of designers.
5. To help setting up private design consultancy offices by offering common model making facilities.
6. To conduct design competitions.
7. To publish design literature.

Another important need of the profession is providing international scholarships/fellowships for practising designers to get trained in design offices for a duration of six months to one year.

These two needs perhaps would be common to most of the developing countries. UNIDO/ICSID help in initiating such activities in the developing countries would be of vital importance for the growth of professional industrial design in the developing countries. SIDI is trying to pursue some of the objectives mentioned above. But the limitations of size and funds available for SIDI focus the importance of backing by the local government and UNIDO/ICSID in this matter.

Members of Society of Industrial Designers of India

APPENDIX C

ASSOCIATION OF INDIAN ENGINEERING INDUSTRIES (WESTERN REGION) and
INDIAN MACHINE TOOLS MANUFACTURERS ASSOCIATION

List of Representatives present at the meeting with Prof. John Reid held on the morning of 2nd March 1978

V.G. Damle (Chairman)	AFCO Ltd. SBRA Division
Bir D. Singh	Voltas Ltd. Design, Engineering & Manufacturing Centre
S.D. Sulakhe	I M T M A
Y.R. Patole	Godrej & Boyce Manufacturing Co. Ltd.
Dr. E.R. Ponkshe	" " " " "
S. Rama Iyer	Power Gas Ltd.
S.D. Kelkar	Kirloskar Consultants Ltd.
A.K. Vaish	Federation of Indian Export Organisations
T.R. Subramamaniam	Chemical Plant of Machinery Association
R.Y. Churi	Star Textile Engineering Works Ltd.
M.A. Pandit	Crompton Greaves Ltd.
G.K. Sankaranarayanan	Simon-Carves India Ltd.
V. Lakshminarayanan	" " " "
R.K. Vakil	Ex-Cell-O India Ltd.
A.C. Patankar	AIEI (Western Region)
A.K. Basu	CPMAI

APPENDIX D

EXPORT PROMOTION COUNCILS

List of persons who attended the Meeting held on the afternoon of 2nd March 1978 at Bombay with Prof. John Reid, UNIDO Industrial Design Consultant

Dinesh Zaveri (Vice Chairman)	Basic Chemicals Pharmaceuticals & Cosmetic Export Promotion Council
V. Ramadurao (Chairman - Panel III)	- ditto -
R.A. Vora (Chairman - Panel V)	- ditto -
V. Sitaram (Secretary)	- ditto -
I. Sundresh (Deputy Secretary)	- ditto -
H.C. Khatiwala	- ditto -
Dion Fernandes (Secretary)	Plastics & Linoleums Export Promotion Council
Prof. S. Nadkarni	Industrial Design Centre, Indian Institute of Technology
Dr. K.P.P. Nambiar	Marine Products Export Development Authority
G.J. Mirchandani	Cotton Textiles Export Promotion Council
K. Vijay Mani	Silk & Rayon Textiles Export Promotion Council
R.S. Janhav	Leather Export Promotion Council
T.S. Sundaramurthy	Central Silk Board
B. Viswanathan	Tata Economic Consultancy Services
P.S. Shetty	Engineering Export Promotion Council
T. Munshi (Regional Officer)	Chemicals & Allied Products Export Promotion Council

A.S. Kasliwal	Silk & Rayon Textiles Export Promotion Council
H.B. Desai	Industrial Consulting Bureau Ltd.
Y.K. Kumar	Office of the Joint Director Export Promotion
P.V. Narayanan	Indian Institute of Packaging
P.L. Mahendra	Bliss & Company
Vasant S. Chipade	Start-rite Shoes Pvt. Ltd.
Yed Malik	Leather Export Promotion Council
H.R. Vijh	Maliks Traders
K.M. Bherwani	Deepak Overseas Pvt. Ltd.
P.K.K. Vydiar (Secretary-General)	Federation of Indian Export Organisations
A.K. Vaish (Secretary)	- ditto -

APPENDIX E

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

INTRODUCTION

The Gujurat Industrial Development Corporation has been established by the State Government. It is a statutory Corporation established in 1962 under the provisions of the Gujarat Industrial Development Act 1962. The objectives of the Corporation are to promote and assist in the rapid and orderly establishment, growth and development of industries in the State of Gujarat and to establish and manage industrial areas and estates in the different parts of the State.

CONSTITUTION

The Corporation consists of twelve members of whom three are official members nominated by the State Government. The Chairman, Gujarat Electricity Board, and the Chairman, Gujarat Housing Board, are also the members of the Corporation. Six members are nominated from amongst the persons having experience in industry, trade or finance. The Chief Executive Officer is ex-officio Member-Secretary, Shri Shanilal P. Zaveri, Chairman of the Corporation, Shri K.S. Pradyumansinhji IAS is the Vice Chairman and Shri L.N.S. Makundan, IAS, is the Chief Executive Officer.

ACHIEVEMENTS

Amongst the infrastructure development corporations in the country, GIDC ranks as number one in the matter of (1) Number of industrial estates planned; (ii) Number of factory sheds built, and (iii) Capital investment

made in land and infrastructure development. GIDC has built 4000 factory sheds almost equal to 25% of the total sheds built in the country. Capital investment made by GIDC is Rs. 60 crores, which is the highest investment made by any infrastructure development Corporation.

By now Corporation has established 78 industrial estates in different districts of the State, covering the entire areas of the State except for Dangs. Therefore on an average three to four estates have been set up in every district, thus covering most of the locations having potential for industrial development.

Thirty-six of these seventy-eight estates are in the ten backward districts of the State. Thus 48% of the Corporation's estates are in the backward areas.

Water supply capacity created by GIDC for industrial use is second largest in the country. GIDC provides a most comprehensive package of facilities to the entrepeneurs.

LAND DEVELOPMENT

The Corporation has so far acquired more than 5000 hectares of land for its estates. Normally 30% of the area is utilised in roads, green space, place for public utilities, etc. and 70% of the land is available for allotment. Thus nearly 3500 hectares were available with the Corporation for allotment out of which 2400 hectares (or 70%) are already fully developed as the allotment made so far amounts to 2180 hectares. Thus 90% of the developed land is already taken by the industries.

CONSTRUCTION OF SHEDS

Most of the small scale entrepeneurs find it extremely difficult to arrange for construction of factory buildings of their own. It is difficult for them to procure

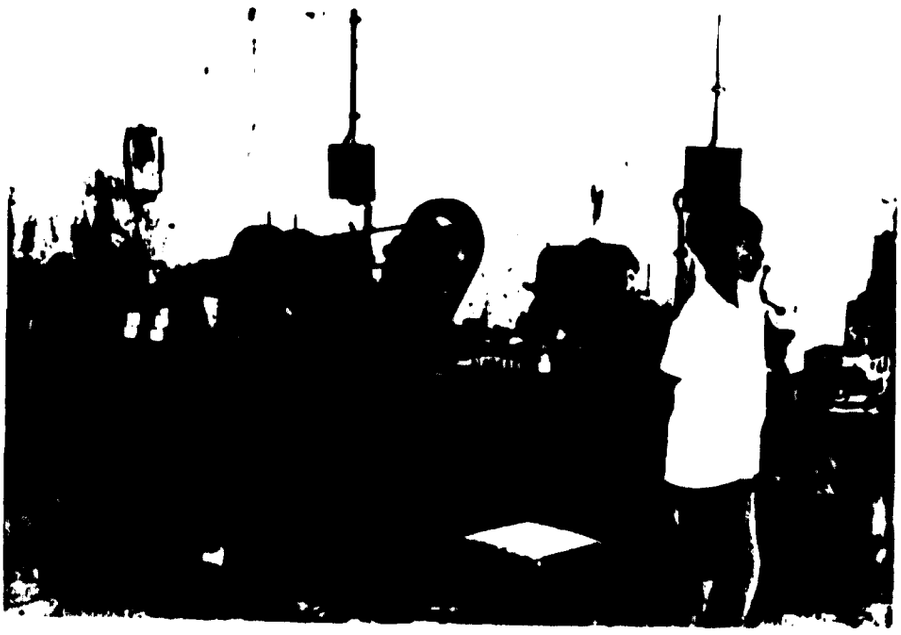
service of architects, engineers and contractors and to procure building materials like cement, steel, etc. They also find it difficult to obtain building permissions from different authorities. It has been observed that if a small entrepeneur is given the ready shed, he is able to commission his unit within a period of six months. As against this, if he takes his own plot, it takes him a period of two to three years to construct the building and set up his unit. In the meantime, the project cost escalates, putting the entrepeneur to a further loss. In order to assist the small scale entrepeneurs to put up their industrial units in the shortest possible time, GIDC has been taking up a large programme of construction of sheds every year.

The sheds are built in different sizes with built-up area varying from 60 to 650 sq. meters. The plots are laid with provision for future expansion. These sheds are suitable for most of the industries and are allotted on easy hire-purchase terms. Initial payment at the time of allotment is only 20% in backward areas and 25% in developed areas. There is a two years moratorium on re-payment of capital, after which it is recovered in quarterly instalments spread over a period of eight years, making the total re-payment period of ten years.

By now GIDC has built more than 4000 factory sheds, of which 3600 (90%) are already allotted, leaving only a current inventory of 10%. Of the 3600 sheds allotted as on date, 2900 sheds or 80% are already put to use; the remaining 20% being in the process of utilisation. The very high percentage of occupation and utilisation of sheds indicates the effectiveness of this programme and the concept behind it.

NEW CONCEPT OF INFRASTRUCTURE

GIDC appreciates that mere provision of land, factory sheds and basic facilities like roads, water and power



A Gujurat Industrial Estate.

only does not meet with the entire requirements of the entrepeneur for the effective functioning of his unit. The entrepeneur requires a very wide range of services like telecommunications, transport, banking, warehouses, fire fighting, services, educational, medical and recreational facilities, housing for industrial workers, etc. GIDC is making intensive efforts to provide all these facilities in its estates, and has been successful in providing most of these essential facilities in its major estates.

By now GIDC has built 3000 houses for industrial workers of which 2600 (85%) are already occupied. In addition, GIDC has got built about 800 tenements through the Gujarat Housing Board in different GIDC estates. GIDC is planning to construct another 1000 tenements during the current year. Besides constructing LIG houses for industrial workers and better houses for the employees, open plots are also given to the entrepeneurs, in the well-laid housing colonies, where they can construct residential houses for themselves and for their senior executives. By now GIDC has allotted about 10 lakh sq. meters of land for such housing.

Telephone exchanges have been established in GIDC estates at Umbergam, Vapi, Valsad, Odhav, Vatwa and Naroda and special cables have been laid for the estates of Pandesara, Ankleshwar and several other estates.

Independent post offices have been established in twenty GIDC estates and ten more are being planned.

A telex exchange has been established at Vapi and very soon Ankleshwar also will have this facility.

Medical, educational and recreational facilities are also available in most of the estates where housing colonies have been developed. The colonies also have provisions for well laid out gardens, green space, etc.

Canteens for industrial workers have been provided in almost all the estates.

Thus GIDC is endeavouring to provide an ever widening package of services and facilities to the entrepeneurs coming to their estates.

RESOURCES

GIDC is a service organisation and is operating on "no profit, no loss basis". Impressed by the effective performance of the Corporation, the financial institutions have been extending their help to GIDC generously. GIDC's total investment, as on date in land, infrastructure development and construction of sheds is of the order of Rs. 60 crores. Against this, the Corporation has been able to raise loans from the banks and the institutions to the extent of Rs. 16 crores and another Rs. 12 crores by way of open market borrowings. Presently most of the financial requirements of the Corporation are met through institutional finance and public borrowings (like banks, LIC, etc.) and the rest from internal resources.

NOTIFIED AREAS

Ten of the large GIDC industrial areas have been notified as Notified Areas. A notified area functions as an independent entity and is vested with powers of local administration. The tax revenue from the industrial area is realised for its development and industries in these areas will not be required to pay octroi and such other taxes to the local institutions. Thus in a notified area more direct services can be provided to the industrialists.

SERVICE TO ENTREPENEURS

It is realised that being a service organisation, the Corporation should strive hard to provide satisfactory and quick service to the entrepeneurs. With a view

to provide on-the-spot service to the entrepeneurs, the GIDC has opened four regional offices, five engineering divisions, eight administrative offices and eighteen engineering sub-divisions in the field. The field officers have full powers for allotment of plots and sheds and measures have been taken to ensure that applications for plots and sheds are disposed of within a period of 30 days.

The task of providing and maintaining services is assigned to the engineering divisions and sub-divisions and they are equipped with adequate power which ensures provision of facilities in time.

INDUSTRIES ASSISTED

GIDC provides facilities for all sizes of industries - small, medium and large. It also provided facilities for all types of industries, viz. petrochemicals, fine chemicals and pharmaceuticals, dyes and intermediates, engineering, textile processing, electronics, garments, food processing, ceramics, minerals, etc. Special estates have been designed for chemical and pharmaceuticals industries. The estates at Vapi, Pandesara, Ankleshwar and Nandesari are ideally suited for water intensive industries like paper, colour and chemicals, etc. In these estates Corporation has created water supply capacity of the order of 100 million litres per day. Because of their proximity to the tidal zones, the estates will have adequate facility for the proper conveyance and discharge of industrial effluents.

INFRASTRUCTURE FOR SPECIAL INDUSTRIES

GIDC makes efforts to identify and provide the infrastructure facilities for industries of special importance to Gujarat. A large estate (850 units) at Surat for art-silk weaving units, an estate for brass parts units at Jamnagar, ceramic estates at Thangadh and Himatnagar, an estate for marble industry at Ambaji and

a proposed special estate for diamond and jari industry at Surat are some of the instances in which GIDC has provided facilities to such special industries and is stimulating faster development in promising areas.

POWER SUPPLY

Gujarat is extremely fortunate in regard to power. There is no shortage of power and no power cuts. To take special care of the industries coming up in the GIDC estates, power stations are being set up, exclusively for the major estates. Such special sub-stations have been established at Vapi (20 MVA), Pandesara (60 MVA), Ankleshwar (20 MVA), Nandesari (10 MVA) and other estates. An effective link-up with the Gujarat Electricity Board ensures that the GIDC industrial estate units get power supply facility at the earliest.

IMPACT OF DEVELOPMENT

In order to ascertain the impact of GIDC's development on the investment, production and employment, the Corporation carries out every year a survey of industrial units in its different estates. According to the survey conducted during the year 1976-77, 3058 units were in production (at the time of the survey) in different estates. The industries in GIDC estates are classified in twenty-eight major industrial groups. The mechanical engineering industry stands first with 35%, following by textiles, 17%; chemicals 15% and plastics with 5%.

The investment in these units is of the order of Rs. 1083 millions and the value of their output is Rs. 1075 millions. It is expected that with the lifting of recession the output value will rise further. These units provide employment to more than 50,000 workers.

One of the unique features of the GIDC estates is that 96% of the units are small scale units. These units

contribute 84% of the employment and 71% of the production with 64% of the investment. The average investment size of a unit in the GIDC is Rs. 3.54 lakhs and output Rs. 5.57 lakhs. Only 293 units were found closed which represents 8.72% of the total units in production in the different estates.

This survey has also indicated that during the year the number of units rose by 32%, the investment by 29%, output by 39% and employment by 22%. This indicates that despite the recession, the units in GIDC by and large have been progressing extremely well.

CO-ORDINATION WITH OTHER CORPORATIONS

Close co-ordination between different Corporations and the State Government is one unique feature of Gujarat, which has contributed to more effective service to entrepeneurs. The units coming to GIDC estates get prompt services from the State Financial Corporations as well as other service Corporations like GEC, GSIC.

APPENDIX F

VISIT OF JOHN REID, UNIDO CONSULTANT, TO INDUSTRIAL UNITS on 4th March 1978

1. Systronics
2. Time Makers
3. Premier Ceramics
4. Ashok Machine Tools

Company: M/s SYSTRONICS LIMITED

Product: Laboratory equipment / measuring instruments

One of the Sarabhai group of companies. This company produces mainly two types of instruments in electronics:

i) Laboratory testing equipments
ii) Measuring instruments

There are about 55 to 60 types of instruments they produce. They have standardized the cabinet size and have facilities to test and arrive at high standard of accuracy. They have highly qualified technical staff.

The company has very sound infrastructure and have been in this activity for a long time. As they are from a large business group, they have awareness of international markets. They have sophisticated approach to design, production, management and planning. The Directors influence major decisions in these areas.

They have shown keen interest in design and National Institute of Design has worked for them for several products:

i) Symbol
ii) Instrument design
iii) Furniture (supplied from NID's collection)

They have a research and development section which makes major contribution in design areas.

Contact: Dr. Ramanathan (Director)
Dr. Srinivasan (Production Manager)

Telephone: 82319: 82362: 82263

Company: M/s TIME MAKERS INDUSTRIES

Product: Magnetic pendulum clock

This is a one-man show in every sense. They (actually, he) make wall clocks with magnetic pendulum and mechanical rotation system. Mechanical components and dials are made at the factory. They make about 125 clocks per month. Wooden cases are bought from outside. Demand is around 300 pieces per month. There are two technicians including the owner. This factory has been established since last four years. This is a very small organisation.

The entrepeneur before starting the factory learnt everything about watch repairing. This he did for several years in a firm producing clocks. For production, he makes all the parts himself. He also has installed machines constructed by himself for solving small production problems. He is basically a highly skilled craftsman by training and takes design decisions himself. Thus in this company he influences all the decisions. (For financial and administrative aspects he seems to be taking help from outside).

Designs for:

i) Dials
ii) Case
iii) Mechanical parts

are conceived by Mr. Desai.

Contact: Mr. Dhirubhai Desai (Owner)

Company: M/s PREMIER CERAMIC INDUSTRIES

Product: Ceramic ware, cups and saucers, bowls, plates

This nit initially began in 1960 under the name of Gujarat Ceramics. In 1965 it was taken over by Kasturbhai group. In 1972 it was taken over by the present owner. They make all their products by jigger-and-jolly process. Their monthly production including all the varieties is 1000 to 1200. They make cups and saucers, curry bowls, rice bowls, soup bowls, coffee mugs and chutney plates. Cups and saucers are also produced using coloured glazes. Their main market is in the southern part of the country, viz. Maharashtra, Kerala, Hyderabad, Madras, and the production is against order. They also deal in china clay.

Having worked in textile mill and plastics industry, and having previous experience in a ceramic industry, the owner has run this unit for the last six years. He decides about production and marketing. This is very much a family business concern.

The design input is almost non-existent. They take a product from the market, sensing the demand, and copy and supply against the order. They have shown willingness to adopt new designs in their range of bowls.

Contact: Vishnubhai D. Patel (Owner)
Maheshbhai Patel (Manager)

Telephone: 65162

Company: M/s ASHOK MACHINE TOOLS MANUFACTURING COMPANY

Product: Lathes

They make only lathes for indegenous and export markets. Export mainly to Australia, Germany, Holland and New Zealand. The company was established in 1961. They make twelve machines per month of two sizes - 4½ ft. and 6 ft.

Decisions regarding design of the lathe are taken by Mr. Nitinbhai, one of the two partners. These are based on:

i) Available technical literature and catalogues
ii) Feedback from the users.

They seem to be the entrepeneurs who would rather perfect one product at a time than divert their interest to many types of products.

They incorporate the suggestions and requirements from the clients. They seriously consider requirements for the operator and have incorporated several safety and storage facilities.

Contact: Mr. Kanubhai K. Naik (Partner)

Telephone: 361920: 361929

APPENDIX G

GUJARAT CHAMBER OF COMMERCE AND INDUSTRY, AHMEDABAD

Shri Jehangir R.J. Cama, President, Gujarat Chamber of Commerce and Industry, while welcoming Prof. John Reid (UNIDO) Industrial Design Consultant on 4th March 1978, observed as under:

Mr. John Reid and Friends:

" On behalf of Gujarat Chamber of Commerce and Industry and myself, I have great pleasure in extending to you cordial welcome on your visit to this Chamber this afternoon. It is gratifying indeed that you are visiting India under UNIDO/ICSID auspices to examine to level of industrial design astivities in our country in connection with UNIDO's new policy to assist industrial design in developing nations.

" As we know, design is something which can more easily be explained than defined. It covers everything from making a better safety pin to planning a new highway system. It enhances communication, simplifies manufacture, use and maintenance. It is not a luxury, nor is it art; it is essentially the product of our environment.

" It may be emphasised that design is of major significance in India because it helps to raise standards of living and therefore within a planned economy it can be a prime agent of change. Through design the relevant traditions can be turned to current advantage which is an important benefit in countries like ours with a rich cultural heritage. In pursuit of our aspiration for a better socio-economic life for our people, we have embarked on ambitious Five Year Plans

with emphasis on development of industries. During the last three decades, industrialisation of this country on modern lines has gathered considerable momentum. Particularly the small industrial units, which have been multiplying rapidly and employing lakhs of workers have a distinct place in the country's industrial economy. Despite this, their methods of management and production require to be modernised so as to enable them to provide more employment opportunities to rural and semi-urban areas. In spite of reservation of more than 500 items in favour of SSI units, the small scale manufacturers of this country with their limited financial resources are unable to devote the required attention for improving designs of their products. There is therefore considerable scope and opportunity for good design in this very vital sector.

" The degree of success in marketing a product depends greatly on the extent to which a fusion of technical quality, functional excellence and visual design is ac[illegible]d. A potential buyer first of all reacts to a par[illegible]ar article objectively, i.e. what would be its utility. But every object, whatever its utility value, should possess other qualities for making an immediate and overwhelming appeal to a buyer. This is where the importance of design lies. Although some progress has been made in the country in the field of industrial designs, there is considerable leeway and scope for improvement in the area of consumer goods design like furniture, cutlery, domestic utensils, household electrical appliances, ceramics and a wide variety of plastic goods. A manufacturer must, therefore, look ahead to produce goods that are pleasing to eye and satisfying in function. What is therefore desirable is a happy blending of appearance and utility. It is in this context that the small scale industries have a greater role to play for supply of quality and better designed products to the fast expanding market

of this vast country.

" Although the National Institute of Design was established in Ahmedabad in 1961 by the Government of India for imparting education, training, service and research in various fields of design, and has made appreciable progress in this direction, yet it cannot but be emphasised that it has still to serve as centre for creative studies in design and fashion. We, therefore, request you to kindly use your good offices with UNIDO for providing substantial assistance to National Institute of Design, Ahmedabad, so as to expand training and research facilities and thereby play a catalytic role in the field of industrial and consumer products design in India.

" It is relevant to point out here that in America and Europe today considerable progress has been made in the field of designs. It would, therefore, be in the fitness of things if outstanding collections of designs in the field of industrial and consumer products are sent to India and exhibited to the manufacturers then it would go a long way in apprising them of the aesthetic values of the west in largely machine-made, mass-produced objects. Such exhibition of the designs of the west was organised in the early Fifties with the assistance of the Ford Foundation and it had evoked considerable enthusiasm among entrepeneurs. If such samples of designs are exhibited in industrial centres all over the country, then it would positively give the manufacturers first-hand ideas about trends in modern designing. We need hardly stress that the purpose of your visit will be amply fulfilled if something concrete is done in this direction.

" Without taking much of your time, Sir, I would now request you kindly to enlighten our members present here. "

VOTE OF THANKS
by Shri Manubhai P. Shah, ex-Hon. Secretary,
Gujarat Chamber of Commerce and Industry

Mr. John Reid and Friends:

I rise to propose a hearty Vote of Thanks to our distinguished guest of today, Mr. John Reid (UNIDO) Industrial Design Consultant for kindly accepting our invitation to be with us this afternoon and apprising us about UNIDO's plan of assisting industrial design activities in developing countries. We are indeed much grateful to you, Sir, for kindly showing a gesture of goodwill to this Chamber which is an apex body representing predominent interests of trade and industry in Gujarat region.

On this occasion, I am reminded of the observations made by the Ford Foundation International Team of Experts in 1953 when they advised the Government of India in formulating developmental programme for small scale industry. The team was of the view that Indian handicrafts and small scale industries could produce and sell more goods both in India and abroad and tap the growing quality market as soon as modern requirements of production and supply were met. I am sure, if the support in terms of modern design is made available to the entrepeneurs engaged in the small scale sector in the country, they can easily and successfully compete any International market in the world.

I am sure looking to the pattern and rhythm of industrial development that is taking place in the country you will kindly use your good offices with UNIDO to extend all possible financial help and assistance in stimulating design activities in India and Gujurat.

I once again thank you, Sir, for kindly accepting our invitation and enlightening us on the subject.

APPENDIX H

OFFICE OF THE DEVELOPMENT COMMISSIONER, SMALL SCALE INDUSTRIES

List of Representatives present at the meeting with Prof. John Reid held on the 8th March 1978

I.C. Puri	Development Commissioner
B.N. Bhattasali	Director (Industrial Management and Training)
S.C. Pandey	Industrial Adviser (Chemicals)
K.D. Khosla	Director (Marketing and SSI Board)
S.K. Roy	Industrial Designer
C.R. Pakrashi	Assistant Industrial Designer
G. Raman	Director (Modernisation)
S.H. Jadhav	Director (Leather)
M.A. Jomraj	Assistant Industrial Designer
A.N. Ghosh	Director
A.R. Sen	Director (Mech.)
B. Majumdar	Industrial Adviser (Electronics)
W.B. Donde	Economic Adviser
Mrs. Usha Chatrath	Joint Development Commissioner

P A K I S T A N

LAHORE - The Punjab

3.1.1 The programme having been changed at the request of UNDP, Islamabad, I arrived in Lahore on Saturday evening, 11th March. No detailed programme was provided on arrival and on Sunday 12th March I discovered that the purpose of the mission had been misconstrued and that meetings had been arranged with planners, architects and environmentalists. This was an unfortunate start but changes were possible and I was also able to speak on the telephone with the SIDFA's assistant who happened to be in Lahore and ask that the programme in Islamabad and Karachi be revised to suit the actual nature of my mission.

3.1.2 Although my new programme specified the times I was to fly to Islamabad and Karachi in order to attend specific meetings, no attempt had been made to make flight reservations at those times and hotel reservations had been made in the most expensive hotels available. Consequently it proved extremely difficult to get a seat on the planned flight to Islamabad. If programme changes are made locally, then the official making the change should make the necessary arrangements and inform the visiting consultant. Otherwise as much time is wasted as is spent in useful research and this is most annoying when time is so limited.

3.1.3 My first meeting was with Zahir-ud Deen Khwasa, Chairman of the Pakistan Environmental Planning and Architectural Consultants Ltd. (PEPAC). Fortunately as an architect he was knowledgeable on the subject of indigenous product design and futhermore, having travelled extensively, could see the problem in perspective. In his view the Pakistan Design Institute located in Karachi, which comes under the Export Promotion Centre, is not known about. They do not invite architects to visit them and learn of their activities, nor do they promote themselves with manufacturers, who are equally unaware of their existence. In his experience groups of visiting experts from overseas had shown that it was possible in a comparatively short space of time to do good research into the availability of skills and materials - easily outpacing the knowledge of the local specialists. In his view the product design course at the National College of Arts in Lahore was not as extensive as he would like it to be. As he is a newly appointed member of the Governing body of the College, this view is clearly of some interest. He further thought that existing local talent was not fully utilised.

3.1.4 I next went to the National College of Arts and met the Acting Principal, Mrs. Abbasi Abidi, who is also Professor of Design. She thought that product designing was misunderstood in Pakistan. She felt that what was needed was an expert designer/teacher who could teach staff and students and over a period of three years or so found a proper department of product design - to "guide and teach the teachers" as she put it. During such a period she would like to send members of her staff abroad for training.

3.1.5 I then visited the College departments which have wood-working, metal working and ceramic workshops with limited weaving and silk-screening facilities for

textiles. I conveyed to her an offer of assistance in teacher training made by the Director of the National Institute of Design in India but she was of the opinion that a decision to accept such an offer lay with the Government of Pakistan in the first instance. She herself has been trying to arrange a visit to India for a group of students since last January (1977) but so far without success. This seems a great pity when such a body of relevant expertise without language or cultural problems exists so close by.

3.1.6 The students have a four-year programme; the first year being a common foundation course, and the College Diploma is awarded after a further three year course of specialisation; the specialisations being product design/textiles/ceramics/advertising (note the term applied to what is more commonly known as graphic design or communications design!). At present there is a total of only nine students studying product design; one fourth year and eight third year students. Last year three qualified, one doing a project on school furniture, one on middle-class kitchens, and one on childrens playgrounds - a project which is being taken up by the Lahore Corporation. The staff are not happy about the state of product design in the College. I was told that students of the College have, in the past, revolutionised architecture and design in Pakistan, but there is no chance of even remotely adequate designers being produced in the present climate. The College consider their diploma to be equivalent to a B.Sc. but as the College is not affiliated to a university, and I was told none would have them, they have to be content with a diploma.

3.1.7 The total product design staff consists of one wood-carver who is accustomed to designing and making one-off custom-built pieces in traditional styles; one general

designer, using such knowledge as he has picked up in all four fields taught, and a part-time teacher who is an architect and again has acquired some extra knowledge mainly in the advertising world it would appear. Maybe I saw them on an "off day" but when I asked to see examples of work or photographs none were forthcoming, and I would rather forget what I saw of their attempts to design lighting fittings. The fine art department which I visited in the hope that I might get more idea of the standard was, to say the least, uninspired.

3.1.8 Apart from the three product design staff under the Professor of Design, Mrs. Abbasi Abidi, one Assistant Professor, M.H. Jaffri, is in charge of advertising and an Associate Professor, Sala Huddin, of ceramics. A new building is under construction and is expected to be available in about six months' time (from March 1978). There is an extreme shortage of funds and they even have difficulty in getting accepted projects, such as the school furniture designs, paid for. None of the staff has the knowledge or experience to establish or run a product design (industrial design) course unaided and they are aware of this. They say themselves that "industry has not felt the need for industrial design" and on the basis of what I saw, I regret to say I'm not surprised.

3.1.9 It will need a great deal more than an expert for three years (3.1.4) to sort this situation out, and it seems a pity that Indian help, which is close at hand, cannot be used.

3.1.10 The country seems to have a unique balance of payments situation where as much or more foreign currency is sent home by expatriates as is earned by exports. For a period of ten years after partition, the unrestricted importation of products and packaging materials was allowed, which meant that by the time a switch to almost exclusively local materials was imposed, an appetite for Western forms had been established. This is unlike India which has continually relied more upon its own efforts in this respect. The over-riding Pakistan tendency is to copy Western products, but at a cheaper price. Additionally much of the needs of the consumer are supplied by shops in the bazaars which manufacture and sell on the spot a great variety of goods.

3.1.11 The cutlery and surgical equipment industry could well do with experienced designers to help develop new ideas and cater for the needs of the indigenous consumer for whom Western copies are not suited.

3.1.12 The textile industry does not experiment nor does it take students from the National College of Arts. It would appear that creative design is left to some ten or twelve active groups among the 131 textile mills. Again like other industries in Pakistan, the textile manufacturers "do not feel a need for textile designers" but from what I have seen of the training provided I regret to say that I am not entirely surprised.

3.1.13 Dr. Ahmad Shah Nauaz is the Chairman and Dr. A.K. Qurechi is the General Manager of the National Design and Industrial Services Corporation Ltd., which has acted as my host in Lahore, which is really concerned with the design and services of industrial plant. They are not concerned with product design.

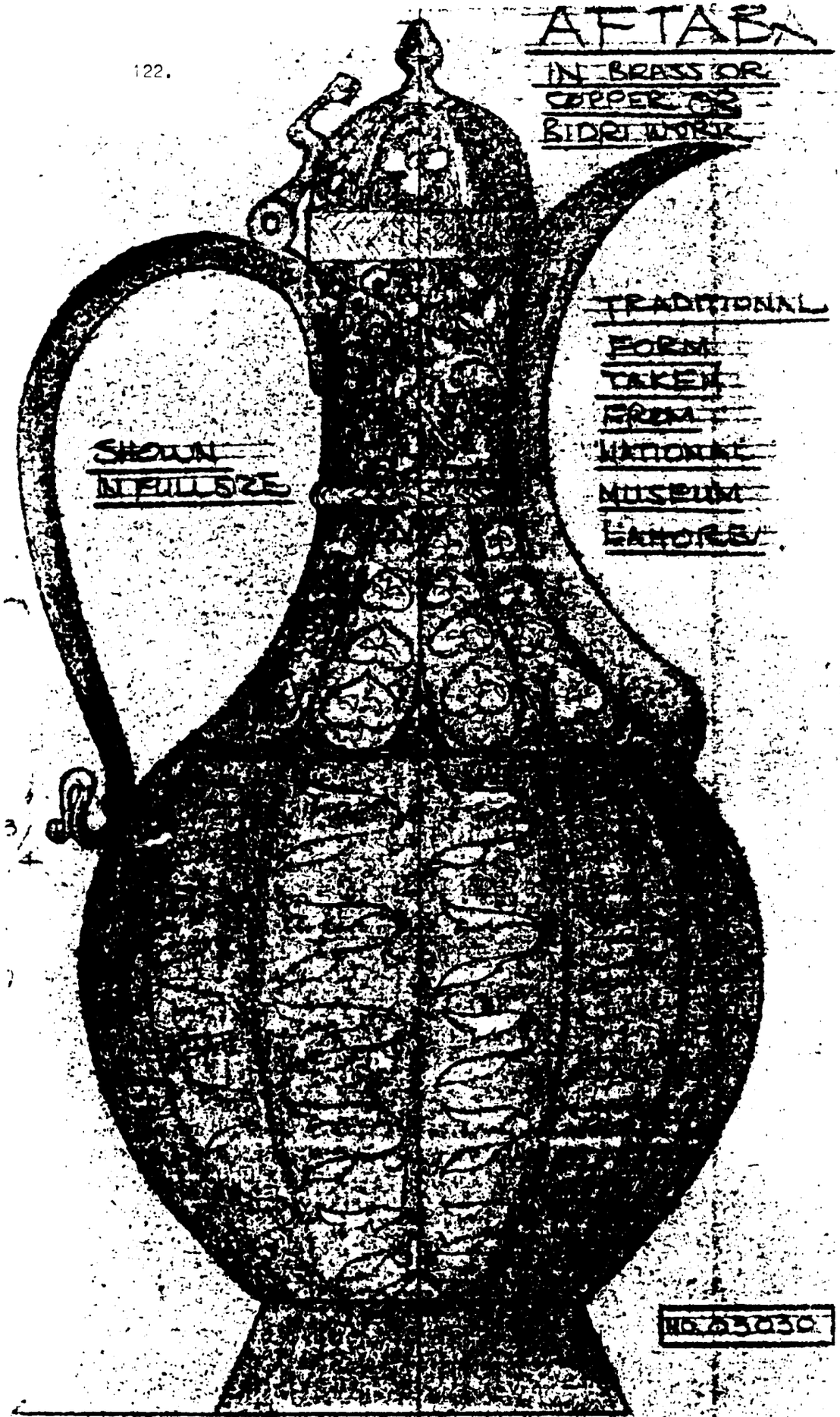
3.1.14 I visited the Handicraft Design Centre which is a section of the Punjab Small Industries Corporation. Organisations such as this exist on a regional basis, Lahore being in the Punjab Region. Five designers are employed in this section, and with administrators, etc. the total staff is twenty-nine. The unit is in the charge of Rana Baknoh who is described as a Joint Director of P.S.I.C. He is an engineer by training and held a wide variety of posts before his present one. The Handicraft Design Centre spends its time producing drawings of a variety of objects, or using them as a basis for developing non-traditional objects especially those considered suitable for export. Most of their work, however, is in fact strictly of the tourist souvenir type and such goods are sold through "Pakistan Handicrafts" shops which the Punjab Small Industries Corporation provides in the major cities as their retail outlet, which also takes care of the difficult task of marketing the products of the small craftsman.

3.1.15 They used to have a workshop for making prototypes and models because craftsmen cannot read drawings as a rule. However as they provide their services to small industry free of charge, the workshop could not show a direct financial return. The Government administration could not understand that the economic return was the benefit to the economy of the developing of small scale industries and so the workshop was closed. This is illustrative of the lack of comprehension by administrators which will impede the development of design unless checked.

3.1.16 Mr. Baknoh is fully conversant with production methods and can therefore give advice where necessary. Craftsmen are given drawings on request - and the Centre has so far produced some 6,000 designs over the last five years or so, and they can choose from the reference collection which is available. Samples of some typical drawings are included in this report.

AFTABA

IN BRASS OR COPPER OR BIDRI WORK



TRADITIONAL FORM TAKEN FROM NATIONAL MUSEUM LAHORE

SHOWN IN FULL SIZE

NO. 53030

W.P.S.C. - HANDICRAFTS DESIGN CENTRE LAHORE

LAMP BASE

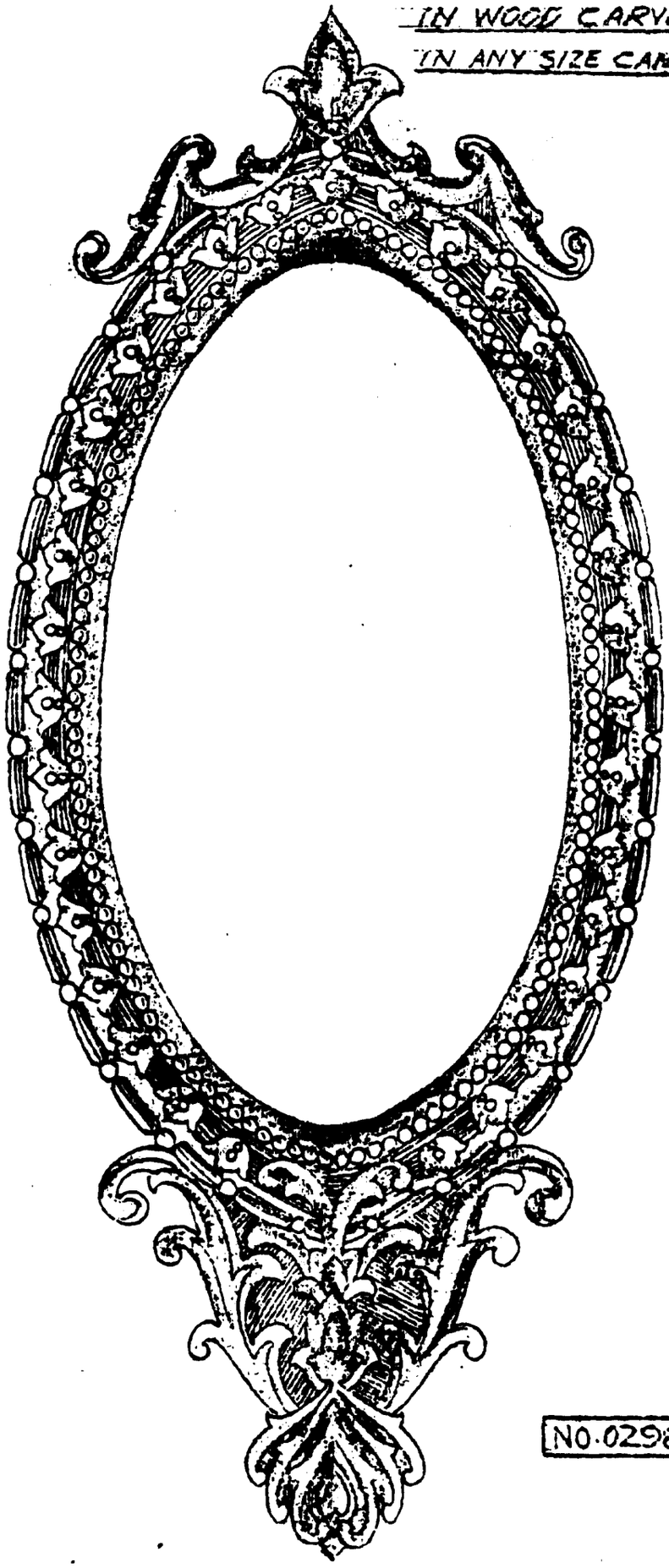
IN BRASS & COPPER

HANDICRAFTS DESIGN CENTRE LAHORE

MIRROR FRAME

IN WOOD CARVING.

IN ANY SIZE CAN BE PRO...



NO.02985.

3.1.17 The Centre deals with all the traditional crafts, wood, both carved and inlaid, camelskin, ceramics, textiles, carpets and so on. They have been collaborating with an American consultant working on the UNIDO/PAK textile project. They have been concentrating especially on the design of carpets recently as this has been a significant growth product for export. From insignificance, exports have developed to 100 crores in the course of the last four to five years.

3.1.18 Their technique of carpet "design" is as follows. The potential buyer tells the deputy chief what sort of pattern and size is required. This is usually by means of the catalogue illustrations of other companies goods - usually foreign. He then instructs designer no. 1 who prepares a pencil drawing of the design, which goes to designer no. 2 who puts it on to point paper and passes it to designer no. 3 who adds the colour-way and then designer no. 4 makes the fair copy. It is more of a processing plant than a design studio.

3.1.19 Pakistani female textile designer who has been working under the direction of the UNIDO/PAK consultant takes traditional patterns and applies them to specified articles in given sizes, e.g. napkins, tablecloths, etc. for Western use. The consultant then "corrects" or alters the colour schemes in accordance with her estimation of what is acceptable in U.S.A. Some of the judgements might be described as arbitrary. "She has the American taste: we have the weavers", said Mr. Baknoh. The Pakistani designer has learnt very little, if anything, from the consultant of the reasoning employed and when she leaves at the end of her mission in a few months' time, after over two and a half years' stay, I doubt if any trace of her presence will exist for long.

3.1.20 In Pakistan, small scale industries are described as those having an investment value of three million Pakistani rupees. This does not take into account the cost of land

but does include working capital, capital goods, buildings, etc; in fact everything else.

3.1.21 The Government is responsible for issuing schedules of industrial requirements and entrepeneurs are encouraged to meet these. The Punjab Small Industries Corporation can make recommendations for schemes and the banks will make loans available. The schedules are advertised in the press and entrepeneurs are invited to apply for assistance where they are prepared to meet the needs specified. Loans are available up to the three million rupee ceiling on a 50:50 basis, i.e. 15 lakhs from the entrepeneur and 15 lakhs from the bank. Although in some special cases where the need is greater the proportion can occasionally be varied to say 40:60%.

3.1.22 Other functions of the Punjab Small Industries Corporation is to establish small industries estates offering facilities at concessional rates and sometimes providing common services. These tend to be service centres of a particular type providing for a specific type of craft. In the Punjab they have already established five industrial estates, with a further five currently under development. There are seventy-seven specialised centres, provided from the Handicraft Centre and these cater for villages where carpet making is carried on, etc. They also have ten village level workshops which are used as training centres, intended to enable villagers to acquire sufficient skills to make it possible to carry out their own light repair work on agricultural machinery and so on.

3.1.23 As previously mentioned, craftsmen need marketing assistance and the "Pakistan Handicrafts" shops have been set up to cater for this need. This is intended to avoid exploitation of the craftsmen by the middle-men, and they operate on only a small profit margin. The "purchase committee" tries to maintain standards and quality.

3.1.24 The Managing Director of the Punjab Small Industries Corporation is Sultan Hameed and he confirmed that their concern was two-fold: (i) development of Small Scale Industries, and (ii) handicrafts. He told me that loans arranged through the Industrial Development Bank of Pakistan were at a concessional 2% over the bank rate and were repayable over a ten year period, with a further one year period of grace. 25% has to be repaid first and the rest by instalments.

3.1.25 Mr. Hameed told me that in addition to the UNIDO/PAK textile project they have been working on a further UNIDO project with a consultant on shoe design and manufacture. As to assistance, Mr. Hameed asked if they could be given the services of an Iranian carpet designer and/or send one of their people to Iran for training, and he wondered about training fellowships in handicraft.

3.1.26 I visted the Lahore "Pakistan Handicraft" and found it to be a typical souvenir, gift shop, full of typical tourist type goods. I could find no evidence of any real design input.

3.1.27 I paid a visit to Packages Ltd., which is a joint Swedish/ Pakistan organisation involved in paper making and the whole range of cartons and packaging required for pharmceuticals, foodstuffs, detergents, etc. It is a large and highly sophisticated modern plant and way above the average level. The company has a design department which operates in a similar way to the studio of a conventional Western-type advertising agency. They employ a number of graphic designers mostly "advertising" graduates of the National College of Arts. It works at a competent, although not very inspired, commercial level, and confirms my view that the NCA diploma would elsewhere be described as of vocational and not degree level.

ISLAMABAD - The Capital of Pakistan

3.2.1 On the 13th March I was received by Mr. Skoumal, the SIDFA, and we discussed the programme for the following day. As there is no Government department with a clear responsibility for, or understanding of design, it was not easy to decide who should be seen. I met Mr. A.G. Mufti of the Pakistan Science Foundation and he was helpful as he had a reasonable grasp as to what was going on in general. He told me that the National Design and Industrial Services Corporation who had arranged my programme in Lahore, were about the only people to visit and that the Punjab Small Industries Corporation was the best of its kind.

3.2.2 I discussed the activities of the Appropriate Technology Development Organisation with Dr. Jamil Mehar, Deputy Director. Their aim is to improve living conditions in the rural areas by means of appropriate technology and he is clearly in touch with the mainstream of this activity throughout the world. As an example of a specific nature, he said that whereas industrially produced matches cost 20 to 25 paise per box, hand-made matches cost only 12 to 13 paise per box. Designs, supplied by the Intermediate Technology Development Group of London, England, could be produced at 30 paise each compared to 40 to 45 paise for the industrially produced article. There are, however, the inevitable marketing problems to be overcome.

3.2.3 They are about to start a small scale rural industry ceramic project in the North using equipment made to designs provided by the Indian Appropriate Technology organisation. They intend to make tableware - cups and saucers, etc. but my question as to whether any consideration had been given to the choice of an appropriate product for the appropriate technology produced a somewhat startled look and I had the impression that he did not grasp my proposition that the

same thought and care needs to go into the development of the product as goes into the development of the appropriate technology, as otherwise its effectiveness is reduced through the unnecessary complications created by trying to copy something conceived for entirely different production and, of course, use. It is worth noting that of the samples of developments given by them, all result from external, i.e. foreign, stimulus.

3.2.4 In order to examine the possibility of immediate assistance to the National College of Arts in Lahore from the National Institute of Design in India, I asked to see the Deputy Secretary of the Economic Affairs Division, Mr. Javed Zafak. (Division in Pakistan is used to denote a Department or Ministry). During the course of our discussion it became apparent that any such assistance or collaboration with India was dependent on a Government decision at the highest level. I appreciate this position as I am fully aware of its implications in the national life, but nevertheless I would venture to suggest that, if not now, then almost certainly in the future, when possibly a better understanding prevails, the possibility of mutually beneficial and immediately available assistance must be utilised.

3.2.5 Mr. Skoumal showed me the work of the UNIDO/PAK Textile Project which I found very interesting as the goods they have assembled for sale, by purchasing direct from the craftsmen, were superior to those which I had previously seen in "Pakistan Handicrafts". However I have doubts about the ability of the initiative to survive when the American consultant leaves in the near future and the present SIDFA's contract expires shortly after.

3.2.6 The remarks made in India about external experts apply here equally: unless the expert is a particular type of person who teaches and inspires, nothing will remain after he or she has gone. It is easier to do the job oneself we know, but the right kind of help is not going to be provided unless a determined effort is made to find the right people.

3.2.7 The negative attitude encountered in Islamabad makes a positive contribution to the report in that it proves that the general air of helplessness and hopelessness so evident everywhere is not without foundation.

3.2.8 Mr. Skoumal did everything he could to assist me during my visit to Islamabad, which largely due to shortness of time might otherwise have been disappointing.

3.2.9 On leaving Islamabad I found myself by happy chance, seated next to Mrs. Yasmin Lari, an architect of repute, on the flight, and as I discovered that she was already working in slum development in an area of Karachi, and bearing in mind the relevance of low-cost housing to the development of industrial design, I decided to include a formal meeting with her in my Karachi programme.

KARACHI - The Sind Region

3.3.1 On Wednesday 15th March I visited the Pakistan Design Institute which is located in Karachi, and is a full design promotional member of ICSID. It was founded in April 1971 as a Joint Pakistan/Swiss Governments enterprise when it was known as the Pakistan Design Centre, and its terms of reference were to improve the quality of Pakistani products for export purposes and to act as a training centre for young designers.

In September 1975 a reappraisal was made by an Evaluation Committee which consisted of Paul Andre Rey (Chairman representing Swiss Government) an industrial economist, Paul Hogan (Ireland) trained as a textile designer but mainly concerned with design promotion; Rafiq Dawood, textile industrialist, and Sahled Malik, Marketing Manager of Karachi Gas, representing the Pakistan Government. Note: the Evaluation Committee did not include an experienced, practising designer when evaluating design considerations. As a result of this Committee's report there has been a considerable change of direction as from November 1977. The report criticised among other things, the dual management structure, technical and administrative, that existed then and recommended a pyramidal organisation with a Managing Director. Aziz Khan, trained as a geologist and formerly in the marketing section of Standard Oil (Esso) was appointed as Managing Director and has been in post since that date.

3.3.2 The Institute comes under the control of a governing body which formerly was composed mainly of the office-bearing Presidents of trade associations, etc., most of whom changed each year. It now consists of the same number - nine - but appointed in the following manner: three

representatives of the Swiss Government, who at present include an economist, an industrialist (CIBA/GEIGY) and the Consul-General; three representing the Government of Pakistan, a Joint Secretary (Commerce), a Joint Secretary (Economic Affairs) Technical Assistant, and the Director-General of the Investment Promotion Department; and three representatives from private sector, a textile industrialist, a marketing director and the director of a mill producing edible oils.

3.3.3 This body meets twice yearly but there is an executive committee which meets every other month as a rule, but can be assembled as required. The Managing Director reports directly to the Vice Chairman, Hamid P. Habib, a banker, and the Chairman is the Minister for Commerce, Haji Buksh Soomro.

3.3.4 The Technical Director and the Commercial Director attend as observers and others can be invited to attend also. However it will be noted that there is no voice with design experience with a right to speak on the Governing Body.

3.3.5 The training activities of the Institute are to be phased out completely with the completion of training of the existing intake.

3.3.6 The new objectives of the Institute in accordance with Article B of the "Aims, Functions and Organisation of the Institute" are:-

> " - To participate, as an industrial partner, in national industrial promotion according to annual targets determined by the Governing Council. The targets will take into consideration the Institute's financial needs;
>
> - To initiate promotional programmes in order to support a better integration with the business community;

- To offer its services as a consultant in the improvement of national industrial design training;

- To promote counterparts training in order to replace all foreign experts by Pakistani Nationals by 1980. "

3.3.7 It was clear from remarks concerning this Institute made elsewhere in Pakistan that it was becoming "an Ivory Tower on the periphary of industrial design", and it had failed to become involved in the mainstream of events. They have not been without difficulties however and attempts over eighteen months to obtain technical lectures, for the guidance of the Institute's trainees, from the usual institutions had been without any success at all.

3.3.8 The trainees themselves are mostly graduates from the National College of Arts, Lahore, following the four year diploma course. At the Pakistan Design Institute they are again given a further foundation training and four years more training before taking the diploma examinations of P.D.I.

3.3.9 This means an eight year training course for a P.D.I. diplomate to reach a standard equivalent to a four year course in a developed country.

3.3.10 The students do not use libraries - they look at magazines (Western publications on style and fashion) but are unacquainted with the concept of academic research, and I cannot but wonder at the extent to which they are capable of practical research or investigation. True there is a lack of reference material, although they admitted they had not made use of libraries such as the British Council library in Karachi, which is an obvious source of material as they are English speaking, and appropriate material is unlikely to be forthcoming if no demands are made.

3.3.11 Textile students after eight years' training, had remarkably little grasp of the fundamental principles of their art. The graphic diplomate talked to at length was, in fact, designing in the manner of a Swiss typographer - all symbols and logotypes being of a very slick Western style showing little or no character of the country of origin. There was no philosophical basis for the designers and they were unable to argue a case or refute criticism with reasoned argument. This is a daunting prospect for someone with eight years' training and some practical experience. With the non-existent, for all practical purposes, product design section of the National College of Arts and the termination of the elementary training programme of the Pakistan Design Institute, there will be no indigenous source of adequately educated and trained designers in Pakistan.

3.3.12 The foreign experts so far appointed have not had educational, i.e. teaching, experience or training. There is a graphic expert only recently appointed, but there is only an assistant to the expert in textiles and the product design expert leaves in May 1978. The two product designer posts are vacant at present. There is no design experience of the quality needed to pull anything into shape at P.D.I. and even less at the National College of Arts in Lahore.

3.3.13 The new aims and objectives stress promotional activities and the replacement of foreign experts by 1980, which is clearly not a realistic objective if the Pakistan Design Institute is to continue to function, indicate a predominance of financial interests which one might expect would be produced by an Evaluation Committee headed by an economist, and lacking sufficient practical design expertise to point out where the value actually lies. The stimulation of industrial development by properly applied design practice is not readily quantifiable and is therefore left out of balance sheets.

3.3.14 The revised structure therefore has great shortcomings and unless definite steps are taken to correct these I cannot see it making the contribution to the cause of better design that is most urgently needed.

3.3.15 The product design section with its dispersed activities and objectives - design - promoting and training simultaneously with one, or two at the most, relatively experienced people, has failed to get designs produced and marketed and has been involved in exhibitions and interior design which have served merely to dilute its efforts still further. Textile designs are not so vitally important and graphic design really makes little difference to the situation, but product designers are really needed in these countries, and furthermore top quality designers who can really teach.

3.3.16 The country can produce architects - therefore suitable candidates must exist for training as designers, but one will have t· start from the very beginning even if one uses - and this seems a doubtful proposition as far as things stand at present - the National College of Arts. This college has been so beset by internal troubles that I cannot see it as a suitable base for a fresh start, and proposals to build a college in Karachi are currently being held in abeyance.

3.3.17 Appendix 'J' shows the advertisement which appeared on the 16th March 1978 in Pakistani newspapers in an attempt to recruit suitable staff to P.D.I.

3.3.18 I was not hopeful of the outcome of the next series of meetings that had been planned for me but events were to prove me wrong and very positive results emerged.

APPENDIX J

Pakistan Design Institute.
a Pak-Swiss joint venture

invites applications from Pakistani nationals for appointment as

Product Designers

to work on projects related to the quality improvement of products manufactured both for export and the local market. Also to become involved in the design and development of products that have potential for the raising of the basic standards of life, health and education of the people of Pakistan. The successful candidate should be prepared to devote considerable time to the promotion of the idea of design as a national benefit.

Qualifications:
Degree/Diploma in Product Design from a recognized university/institute or a degree in Architecture from a recognized university.

Age:
Below 40 years.

Salary, allowances and other terms commensurate with qualifications and experience.

Applications with complete bio-data, photostat copies of certificates/testimonials alongwith a recent passport size photograph must reach the Managing Director, Pakistan Design Institute, 16 Muslimabad, Karachi-5, not later than 9th April, 1978.

SOURAYS-30 904-2

3.3.19 The first meeting was arranged with the Pakistan Automobile Corporation Ltd. and car manufacturers throughout the world are noted for their concept of design as styling. I was accompanied by Aziz Khan, Managing Director; Saleem Abdullah, Commercial Director, and John Ballyn, Product Designer, all of the Pakistan Design Institute, who came to all the day's meetings. We met the General Manager, Col. (ret'd) Aijaz Ahmad Hashmi and Javard Ahmed, Projects Manager. Col. Hashmi explained the nature of the Corporation's operations which are mainly the assembly of foreign car parts sent in "kit" form and the assembly of components with the addition of home-produced parts; for example, Bedford trucks, 60% of which are imported material and 40% of local manufacture. Not all of the locally produced components are made in their own plant as they have numerous small contractors as suppliers.

3.3.20 As the vehicles they assemble, or partly produce, are made under licence agreements with foreign companies for vehicles that bear their brand names, they are not allowed to alter or develop the models without express approval. This inhibits the growth of any product design capacity in Pakistan and the Pakistan Automobile Corporation is limited in design terms to modifications of manufacturing processes to suit local conditions, e.g. making use of pressing instead of casting, adapting extrusions to folding, and so on. Trade names quoted included General Motors, Bedford, Ford, Suzuki, Toyota, etc.

3.3.21 After explaining the nature of my mission and clearing up confusion over design of jigs, tools and plant, I probed the availability, should it be needed, of product design capability and the answer was a clear "no" -"it does not exist". In reply to questions as to why the concept of adapting or de-tuning from sophisticated manufacturing techniques to simpler techniques was not applied equally to matters of product suitability

(appropriate technology - appropriate product choice) it emerged that designs for a suitable local 'bus body was, in fact, desperately needed. Karachi has its own problems which require different load capacities leading to specific seating configurations to permit higher numbers of passengers per vehicle, with construction suited to longer life and different user requirements, facility for repairs and so on.

3.3.22 I pointed out that no foreign maker was likely to devote the energy and resources required to solve these problems for a maximum total run of 2,000 'buses a year, as in the automotive industry terms this is a very small quantity. Therefore I suggested that this was a clear example of the need for Pakistani industrial designers to solve Pakistani user problems. But these do not exist and as Javard Ahmed said: "to develop indigenous designers is a mammoth task.

3.3.23 As Projects Manager, he is in a good position to encourage the right sort of development and he is aware of the need that exists. It seemed a suitable moment to make a first proposal and I suggested that the Pakistan Design Institute and the Pakistan Automobile Corporation use the specific local 'bus body problem as a project. This was well received and both parties agreed to meet and discuss the implementation of the project.

3.3.24 Note: On many occasions in the first part of my mission in India it was possible to effect introductions, and I am hopeful that in a number of cases results will develop from initiatives I have proposed at such times.

3.3.25 The meeting finished on an optimistic note and the group was in good heart when next approaching the Chairman of the State Heavy Engineering & Machine Tool Cor-

poration Ltd., Mr. Jawaid Ahmad Mirza. Following the usual explanation of my mission and the achievement of an understanding of its nature, my views on the lack of product design capability brought the view from the Chairman that it was a pity that I had not been able to visit TEXLA, when in the north, as they had a design capability. This gave an opening to John Ballyn who explained that the Pakistan Design Institute had prepared and sent a report to SHEMTC explaining how the design of gantry crane caps could be rationalised - they make three types of cab without using any common components or apparently paying any great attention to ergonomic requirements - no reply even had been received to any of the many letters sent.

3.3.26 This caused concern to the Chairman who undertook to read the report and lend his weight to P.D.I. in pursuing the project as he was previously unaware of its existence. This was a further instance of "missionary" work giving renewed hope to P.D.I.

3.3.27 Following this breakthrough we went on to discuss the need to get away from copying, and to the design of machine tools that really fit the needs of indigenous industries. It was Mr. Mirza's view that Pakistan professionals "fail to profess their profession"! and that another major failing was the lack of suitable Government support, and their failure or unwillingness to produce a policy for indigenous technology. It is easier to import expertise, which kills local development.

3.3.28 The lack of an overall view of the situation is a major failing. Mr. Mirza showed that he is not in favour of the usual type of seminars, etc. but believes in action. We found ourselves in agreement. A multi-directional approach is required at all levels and perhaps therefore the most important single role that UNIDO can play in

Pakistan is to educate Government. From this meeting a concept began to emerge and is in line with the existing proposals for a ministerial level conference in India. By this time the Pakistan Design Institute were also beginning to feel somewhat elated.

3.3.29 The final meeting of the morning was with Mr. Hamid P. Habib, Chairman of the Export Promotion Bureau (also financial adviser to the Government and vice-chairman of the Governing Council of P.D.I.). After the usual introductions and explanations, Mr. Habib ventured the thought that "a small leather purse for the pocket" might be a suitable design project for P.D.I., which gave an ideal springboard to launch into an account of the morning's work - the 'bus, the crane cabs, the simpler machine tools, and I went on to include a more efficient kerosene stove for rural villagers. Stoves made by small industries are not tested either for basic design or for performance, and many of them are nothing short of lethal weapons!

3.3.30 The contrast of subject matter was dramatic and my condemnation of the current Pakistan Design Institute interior design project for Pakistan International Airlines offices in Karachi as being totally irrelevant to the needs of the country and a wanton dissipation of the meagre facilities of P.D.I., brought home the point with some force and clarity. The needs for socially necessary design dawned as a new light on Mr. Habib and his imagination was fired with new purpose - it is now mainly up to Aziz Khan and P.D.I. to fan the flames and keep it alight!

3.3.31 In the afternoon I had asked for a proposed visit to a textile mill to be cancelled and had called a meeting between Yasmin Lari, the architect, Aziz Khan, Saleen Abdullah, John Ballyn and myself as I felt they were the people I had met in Pakistan who had most ideas and motivation for the development of design in Pakistan.

3.3.32 We discussed the problem facing the Pakistan Design Institute in the recruitment of product designers to fill the existing and anticipated vacancies. Aziz Khan thought that his Council would be prepared to provide an adequate salary for suitable people. I explained how after the Second World War, Britain was without trained industrial designers and architects filled the gap - many turning to industrial design and adding the necessary skills by their own research and efforts. Mrs. Lari thought that it might be possible to find one or two young architects with the right motivation and undertook to help in the recruitment, at the same time efforts in London and at the Middle East Technical University will also continue. I then asked her to tell the others present of the slum improvement scheme we had discussed on the 'plane from Islamabad to Karachi. She described her scheme of self-help by the inhabitants. First of all she met a number of women from between twenty and thirty different areas, as she had decided that, as a woman, she could work best through the women in the slums. From this group she selected two or three areas that she thought stood the greatest chance of success (the same philosophy I used when urging the Indians to obtain a variety of projects for small scale industries for a similar purpose). One area was finally chosen and when she suggested to them that they should clean up the street and remove the garbage, they replied that the Karachi authorities should do it. She asked them if the authorities ever had done this for them and they told her no, they hadn't, and she told them not to rely on the local authority. They saw the point and started themselves. She suggested that whitewashing the houses would improve things and they asked who could pay. She said she would provide white-wash for outsides of the dwellings if they provided it for the insides.

3.3.33 Once the women of the village became involved, the community became involved and soon the men were white-

washing, and cleaning up the streets. This led to the planting of trees and they were soon encouraged to plant vegetables as well; sewing circles and other community activities were encouraged; and boys formed a music group and earned money as entertainers.

An attempt was being made to start a vocational training centre and Mrs. Lari was trying to obtain 3,000 rupees worth (approximately 300 U.S. dollars) of materials to enable them to repair the open drains themselves, and a mobile dispensary was being arranged, when political troubles in Pakistan caused the Government to fall and stopped further progress of the project.

3.3.35 The lesson remains - show people that someone cares, build up their self-respect, encourage them to use their own efforts and use outside money only to overcome specific obstacles. Often these are small enough but can prevent any development.

3.3.36 At this point it seemed a suitable time to recount the U.K. story of the architecturally-based development of industrial design practice and training and draw a parallel with the present situation in Pakistan. The vacant posts in the Pakistan Design Institute are unlikely to be filled unless by architects and in that case the more relevant the next few industrial design projects are to housing, equipment for houses for example, the more likely they are to bring about successful design solutions from people who have not been fully trained in industrial processes. The moral of the morning meeting with Mr. Habib was clear for all to see. The advantages of integrating new industrial products into a slum improvement scheme so that a greater improvement in living standards could be more readily demonstrated by the mutual support of both approaches was recognised.

3.3.37 It was decided to form a professional society and the Design Society of Pakistan came into being at 4.30 p.m.

on 16th March 1978 . Membership will not be unneccesarily restricted and any relevant qualification will be accepted until such time as the new Society is better able to determine its terms of reference. A telephone call from Aziz Khan on 17th March confirmed my impression that the Pakistan Design Institute has a new sense of direction and that real efforts to promote the Design Society of Pakistan will be made. 16th March could, Inshallah, be a turning point for Pakistan design.
(Note the address of the Design Society of Pakistan is E.6, 4th Gizri Street, Defence Society, Karachi 9)

3.3.38 On Friday the 17th March I visited the small town of Thatta about 100 km. from Karachi and examined the houses, open shops and workshops and spoke to many of the craftsmen; blacksmiths, wheelwrights, woodturners, etc. Much of Indian and Pakistani small scale industry is below even the smallest scale factories on the industrial estates that have been described. A vast amount of work is done in, or in front of, the open bazaar shops. Cooking utensils, tools, practically every conceivable kind of small artefact is made in this way. Where trades exist, jewellery for example, "service units", i.e. toolmakers, platers, silver bar rollers, polishing shops, all co-exist near the small groups of individual craftsmen. Often they use tools and methods which have not changed since the Middle Ages. Sometimes a bow lathe will have had an electric motor added, and blacksmiths use hand-operated mechanical blowers not the traditional bellows.

3.3.39 However where the demand justifies it quite sophisticated machine tools are used. Great economy is practised and a single motor will be used, through a "Heath Robinson" array of belt drives, to perform an unbelievable variety of tasks. Great ingenuity and skill is to be found and all the craftsmen I spoke to were very friendly and co-operative. Much could be done by visiting consultants with the right sort of down-to-earth practical and commonsense approach to design problems and a true

APPENDIX K

SOCIETY OF DESIGNERS . OF PAKISTAN

The Society has been formed on March 16 1978. Its aims are similar to those of the Pakistan Council of Industrial Design which it succeeds and substitutes. The Organising Secretary is Yasmin Lari and the Secretariat is at this address. Membership is open to designers and promoters of good design.

E6 Fourth Gizri Street Defence Housing Society Karachi Telephone 532341

appreciation of peoples needs.

3.3.40 Throughout Pakistan it is noticeable that money is very much to the fore in discussions and more often than not people are looking for a "hand-out" from the U.N. This is totally different to India where it was often said that money was not the problem and advice and guidance were what was needed. Profitability is a fair way of measuring design success and is a method I would always use to persuade people it was worth their while to produce well-designed goods, but the money motive and acquisitive attitude of the average Pakistani is something that must always be taken into account.

3.3.41 On the evening of the 17th March, Yasmin Lari and her husband, Suhail Lari, Managing Director of the Khyber Insurance Co. Ltd., invited a number of people interested in design to meet, with one of the objects being to promote the development of the new Society. It was decided that to get unambiguous initials it should be called "The Society of Designers of Pakistan". Among those present was Adishar Cowasjee, the founder of the former Pakistan Design Council, once a member of ICSID, which was disbanded by the Export Promotion Council in favour of what is now the Pakistan Design Institute. The lesson to be learnt from this was pointed out and it was stressed that the new Society of Designers of Pakistan should be an independent body of professionals open to graphic and textile designers and avoiding the confusion often caused by the inclusion of the word "industrial" in the title. It will be necessary for them to remember that their main aim is to further the development of product design and not allow themselves to be diverted by graphic or textile design which might largely be considered to be irrelevant at this stage.

3.5.42 A number of prominent and influential people were present and this leads me to believe that it should not be too difficult to get the relevance of industrial design to Pakistan's future development brought to the attention of those in high places in Government.

3.3.43 Scheherezade Alam, a young but acclaimed ceramicist, was also present and is a clear thinking young lady who has learned much of her art from her own efforts in industry, but regrettably not as a result of her stay at the National College of Art from which she says she "emerged knowing nothing". She has spirit and should be a useful member of the new Society. Others present included Zahoor Ul Alaque and Ahid Sassad Shahid, a painter and sculptor respectively but interested in the formation of the Society. By the following morning Adishar Cowasjee produced the proof of a handbill announcing the formation of the Society of Designers of Pakistan, which is the finally agreed title. (Appendix 'K')

3.3.44 Following pre-mission correspondence with the Secretary General of the Federation of Pakistan Chambers of Commerce and Industry, I had been looking forward to meeting a number of people at the session arranged by them. However I, and members of the Pakistan Design Institute, were the only ones present at the announced time - 11 a.m. on Saturday the 18th March. By 11.10 a.m. two representations of Philips (Pakistan) had arrived and so had the Secretary General, Tufail Admad Khan, and the Vice-President, Ghazi Naseeruddin, as the President himself was indisposed. We started with ten people present, four being myself, the PDI and SDP, and by 11.30 a.m. we reached the total of thirteen inclusive.

3.3.45 The discussion was interesting and much of it centred on the presence of the Philips Industries representatives ·

particularly in view of the Philips/ICSID award of which they were unaware. As before, the usual misunderstandings of the term industrial design were first cleared up and the nature of my mission explained. Philips pointed out that Eindhoven designed products did not always meet local conditions and so modifications were made but mainly to things such as TV cabinets, which are made in Pakistan. Their system is that the marketing people say what they think the market requirements are and three people in the design department, a mechanical engineer, an electrical engineer and a carpenter, make models for their selection and final approval. They obtain additional workshop assistance as required.

3.3.46 Adishar Cowasjee made a forthright criticism of their local design standards, which was not refuted, and in fact they stressed that industrial and product design assistance would be most welcome. Knut Yran at the Concern Industrial Design Centre in Eindhoven should be informed of the situation in Pakistan, as "design" here means at most a few cabinets, criticised as basically ugly, and their embellishments, considered to be more so. Philips representatives also said that assistance in the design of industrial buildings was needed. After some discussion, during which I stressed the way in which good design could lead to improved utilisation of resources in labour and materials, etc., it was agreed that the Federation of Pakistan Chambers of Commerce and Industry would form a Small Design Sub-Committee to work with the Pakistan Design Institute, whose work and intentions were described to the meeting by Aziz Khan, Managing Director. If they could get a few interested people to do this it should be possible to make some progress in the dissemination of information to industry in Pakistan. I stressed the need for the establishment of channels of communication and a clear understanding of needs before any UNIDO aid or support could be forthcoming.

3.3.47 The Federation vice-president said they were prepared to co-operate but lacked expertise and that a UNIDO survey of consumer needs, both indigenous and export, would be most helpful. I forebore to reply that the intiative and the money should come from them as the helpless attitude and lack of interest fails to impress me as to the value of anything which they were not made to pay for!

3.3.48 Lack of experience leads people to imagine that there are tremendous obstacles to be overcome in order to achieve their objectives and that financial outlay beyond their means is required. Often the task is within their capabilities and means if only they knew how to tackle it.

3.3.49 The afternoon was spent in private discussion with Aziz Khan of the Pakistan Design Institute. We discussed the internal disagreements of PDI between experts on the role of PDI, the change of direction from training to commercial activity, and the dangers of the objective "to maximise earnings". It seemed to me from the evidence I had seen that the former Pakistan Design Centre had attempted to do far too much and a change in direction was necessary. In answer to Aziz Khan's question, "can we live with this", I pointed out some of the dangers I saw in the situation and suggested ways of bringing them home to the Governing Council, but he is not a designer himself and the expert design director apparently suffers from an inability to communicate and remains silent at Governing Council meetings. Twenty lakhs of rupees (two million) are spent annually, excluding expert's salaries and expenses, and a quick calculation showed that at the most only 10% can be recovered by the fee earning capacity of the Institute, and even this is dependent upon the recruitment of adequate and suitable staff. Concentration on a specific objective is of paramount importants. It is possible to obtain projects, as recent days have shown, but they have no people capable of realising them.

3.3.50 The early formation of a Pakistan School of Design, which could well be sited in Karachi, is a pre-requisite to the proper development of industrial design in Pakistan.

3.3.51 Dupraz, the senior technical and artistic (sic) director, visits for a few days every six weeks (when there were two Swiss experts they alternated every twelve weeks). This is neither the type, nor amount of support required, especially as some of the experts do not speak English, the local lingua franca, and are bad ("awful" was the word used) communicators anyway. Aziz Khan desperately needs two native English speaking graduates to fill the existing vacancies until such time as Pakistani designers are forthcoming. Aziz Khan can and will have to do the design promotion, but as a non-designer can often only do so with John Ballyn's assistance, and his contract was about to expire. Aziz Khan wants UNIDO to send an expert designer capable of talking to Government at the highest level, as he sees this as essential if design activity is to be developed in Pakistan. This makes sense as only the foundation of a Pakistani School of Design, 'de novo', will serve to create a profession. As the Chairman of the Heavy Industries Corporation said, "a Government policy package is needed". This is also confirmation of the need to hold the Indian Design Seminar at ministerial level.

3.3.52 Aziz Khan has told the Swiss experts that he will only accept "outside" appointments of people whose mother tongue is English and who are able to communicate. In principle he is agreeable to the concept of a close working relationship with the Indian Institute of Design and warmly welcomed the invitation I conveyed to him at Ashoke Chatterjee's request. However, as stated in the earlier pages of this report (3.2.4) the approval of the Government of Pakistan is absolutely essential before any dialogue could commence with the National Institute of Design in Ahmedabad.

3.3.53 Government support for design in particular is a pre-requisite for every other activity. A school must be founded and for this an advisor on Art and Design Education is required. These points must be put into the form of firm recommendations so that if possible people of the right weight and experience are provided.

3.3.54 There is a great shortage of literature on the subject of design in Pakistan as conversations with the Pakistan Design Institute trainees and staff showed. Only magazines are available, so that any attempt to develop research capabilities of students or designers is hardly likely to succeed for lack of basic information. Perhaps UNIDO could consider the creation and loan, or gift, of suitable basic design libraries. The book list would have to be carefully selected but this would not be beyond the capabilities of any good Art and Design college librarian.

3.3.55 The afternoon's exchange of views was full and frank and I was most pleased that I was able to leave Karachi knowing that the small group who are trying to develop good design in the country were in far better heart than when I arrived and that I was leaving an embryonic Society of Designers of Pakistan which, Inshallah, will grow.

CAIRO - Capital of Egypt

4.1.1 My mission in Egypt, starting on the 20th March, was centred on the Engineering and Industrial Design Development Centre, which is a UNIDO project.

4.1.2 For the first three to four years of this Institution's existence, Eastern European experts developed basic engineering skills, mainly mechanical, etc. Engineering and Industrial Design graduates were accepted by the organisation and worked together mainly on technical design work. The industrial designers were not allowed to develop their own particular expertise in the centre and creativity was stifled.

4.1.3 Products were not directly related to industry or to industrial requirements. The projects chosen were, in fact, abstract and the visiting experts did not become involved with Egyptian industry.

4.1.4 Work programmes also had an unrealistic attitude to time and, for example, it took some two years to develop the design for a simple cooking stove. The experts decided upon which projects the centre should study and these included such things as a cigarette lighter, an electric iron and a torch, which incidentally called for between sixty and seventy tools for manufacture, and a punch design for the spring needed for the torch was worked on for two years. As a result the Company it had been hoped would produce it would not accept it.

4.1.5 A further mistake was that they did not charge fees for work carried out - this is inevitably a fatal approach as it gives no sense of value of the effort involved to the Company concerned, although they did attempt to obtain a 'bonus' for the staff involved.

4.1.6 Approximately four years ago Dr. Yusef Mazhar was appointed director. He was trained as a mechanical engineer but soon realised the conflict between industrial design and technical design. Slowly a concept of industrial design began to emerge but industrial design was kept within the "Product Design" Division of the Centre. Please note that "Product Design" in this context is used to denote mechanical engineering concepts not 'Product Design' used as an alternative expression for 'Industrial Design' as sometimes occurs in other countries.

4.1.7 The new concept extended to considerations of actual need, use, marketing, etc., indeed a proper concept of Industrial Design, and as a result products became more successful, a direct relationship was established between manufacturers and their needs, and proper fees were charged. Slowly a pattern began to develop and interesting and useful products resulted.

4.1.8 A point was reached when the industrial designers were asked if they thought they could stand on their own as an independent section within the Centre. This was a critical question as bonus schemes exist which are related to the overall success of the division as a whole. The immediate effect therefore would be a loss of earnings until such time as the new group became established and even for some time after as it could hardly expect to be as financially successful as the larger, more technically orientated units. However

they displayed an encouraging self-confidence and chose to stand on their own feet.

4.1.9 Despite the criticism of earlier restraints, the engineering training which had been given stood them in good stead, and they were more enterprising than their "product design" colleagues. Those who were keen to design for the consumer were eager to change to the new industrial design section. The methods of working are sound and projects are handled from inception to parts drawings.

4.1.10 A large building complex on the Giza road had been erected for the Small Scale Industries Bureau which became defunct and had stood empty for several years. This was offered to, and taken over by the Engineering and Industrial Design Development Centre who are currently developing it further. The object of the EIDDC is not to help the artisan or village industries as such but rather to assist in the development of "organised" industry, whether small or larger scale, involved in light engineering, furniture, ceramics, and so on. Some interior design work is also carried on.

4.1.11 The Centre has six divisions:-

1) Industrial design
2) "Product design" i.e. engineering design
3) Engineering and technology (production processes tooling - jigs, dies, etc.)
4) Plant and factory layout (from small workshops to larger industrial units)
5) Capital equipment and mechanical handling
6) The training division - having twenty standard courses: welding, estimating, tooling, draughtsmanship, etc. (They have no alternative but to provide training courses) The programme has

been running for about two years and the annual intake is about one thousand trainees.

4.1.12 Seminars are also arranged with the objective of showing Egyptian designers and industrialists the value of design. This is a missionary type task and is also intended to show off the facilities available at EIDDC to those attending the courses in the hope of attracting further projects.

4.1.13 There are also specialised courses in maintenance management which is a particular subject requirement of Egypt.

4.1.14 It is clear that ICSDI/UNIDO courses or assistance in the training programme would be most welcome. The Director sees courses and seminars as a source of cross-fertilisation. The Centre has an "Information and Documentation Centre" (their title for a library). This is small in relation to the scale of the Centre with its staff of 365. Material is indexed under key words which is fair enough for a small library but the list of titles is poor and far from adequate. According to the SIDFA, books could be purchased from the annual grant, but the Director says he prefers to spend money on people - experts, etc. and obtain books locally. However in my view this is not an adequate or successful policy and should be reconsidered. A radical improvements of this facility is essential in my view.

4.1.15 One of the other major tasks of the Engineering and Industrial Design Development Centre is to explain to Government ministers, etc. the relevance and importance of industrial design.

4.1.16 The industrial design section has ten designers, three draughtsmen and an Arabic script calligrapher at present.

They are comparatively well trained and experienced by developing country standards, but lack mature judgement and experience. This shows in the rather heavy-handed use of expensive materials, e.g. washing machine handles which are too large and over heavy in construction. Failure to appreciate the design possibilities of the techniques being used is evident, e.g. a handle designed in the form of an extrusion when actually intended for casting, a more expensive but the only available method, which would confer considerable design advantages if properly appreciated. A rocking chair prototype in wood showed a sophisticated side elevation - probably of Danish inspiration - but no understanding of construction manifest by the use of a double structure; i.e. a supporting frame for a frame which was in itself rigid, with very heavy sections of timber; no less than four times the amount of material required, with no understanding of wood jointing techniques leading to impossible lines on paper and a bodged job from the carpenter who, rightly, declared them to be impractical but could not himself produce a superior solution. Wood is an expensive imported material.

4.1.17 Chairs are difficult to design and this was only the second chair that the particular designer had attempted. Following discussion of the problems, I found the designer the following day in the "library" trying to improve her knowledge from the meagre sources of reference available there.

4.1.18 Clearly the industrial design section means well and in the circumstances is doing a good job but it is lacking in experience and requires further support and encouragement.

4.1.19 As the office hours are from 8.30 a.m. to 2.30 p.m. - a six hour day - less is done than in a conventional European office. Furthermore, as seems to be the

custom in Egypt, salaries are low and second jobs have to be taken in order to obtain a living wage. This means that many actually work far longer hours than in the West with a corresponding drop in output. There was no evidence of feverish activity on any of my visits, but despite this the intentions are good. This therefore is a further problem for consideration.

4.1.20 Yet another major problem is the fact that the unit is designing for both public and private sector industry, and is competing with itself - a fact seemingly overlooked. They declared proudly that they were simultaneously designing about nine different washing machines - some of equivalent size and performance - for different manufacturers. They did not seem aware of the difficulties of conflicting interests that could arise, i.e. who gets the better of two similar designs?

4.1.21 Whilst the Centre should be encouraged and further developed, as at present it is the only existing base for industrial design of any strength in Egypt, unless the problem is clearly recognised and faced up to, it could work against the establishment of an independent design profession in Egypt. Therefore the structure of this UNIDO programme should be given serious consideration with a view to establishing a development pattern for the future. It is significant that the Centre expressly excludes any attempt to assist small scale industry - which probably represents the greater part of industrial production in Egypt.

4.1.22 The only course in industrial design in Egypt belongs to the College of Applied Arts of Helwan University. This course was started in 1961 and consists of a five year course leading to a B.Sc. degree. It is in fact the only course of its kind in all the Arab states. There are approximately 150 students in all, roughly

70% male and 30% female, and this gives an average year class size of about 30. The first year concentrates on design and materials - form, function and material by means of the manipulation of material by bending, cutting, forming, etc. The second year studies design methods and techniques to develop creative ability and to understand, as they put it, the "man-machine" relationship. They seem to have fallen for the popular design jargon of the day which leads to some peculiar uses of English in their daily lives.

4.1.23 Teaching is in Arabic, which is natural enough in an Arab country; however all technical drawings in the country are annotated in English and most of the available reference material is also in this language.

4.1.24 Projects undertaken in the second year consist of component parts of larger assemblies - of which petrol-filler nozzle guns and hand shower-spray attachments seem to be common examples. They are consciously taught to work as members of a team, and projects are set for them rather than as a free choice. They work as a team on research but individually on design concepts and then again as a team in project development.

4.1.25 The course has the rather unusual title of "Implements and Equipment" and tends to lean heavily towards engineering products. There is also a rather overweight concentration on design methodology and morphology which seems to be restricting the development of the students. From the long question-and-answer session I engaged in with the student body, there is clearly doubt in many of their minds as to the appropriateness of the direction of the course. This is a reasonable doubt and I understand there have been some troubles over it in the department in the recent past. The work I saw was of a depressingly low standard of layout and presentation, and as you cannot have two standards of quality, the design content suffers.

4 1.26 The College of Applied Arts also had in addition to: (i) "Implements and Equipment"; (2) Interior Design, which has a slightly better standard of presentation and a rather more creative approach to the subject; (3) Textiles and Weaving; (4) Photography (including film and TV); (5) Applied Structure - decorative section.

4.1.27 In addition to "Implements and Equipment", there are also specialisations in glass, ceramics, decorative ironwork and jewellery.

4.1.28 Third year students attempt more complex problems, e.g. a dentist's chair, electric iron (the staff choice of example; note variation in scale) and there are lectures in production technology and materials technology, with lectures and research in art and design history. Ergonomics has also been started as a separate course. There are field studies and some attention is given to marketing and (they say) draughtsmanship and presentation. If, as I suspect, this is when they start trying to improve the standard of work, then they have left it too late.

4.1.29 In the Fourth and Final years, students choose their own projects and select some specific aspect of the problem for detailed development. The Degree project uses thesis, models, presentation and technical drawings. But note comments on standard of achievement.

4.1.30 One must comment that the whole environment of the college buildings, whilst admittedly undergoing major alterations, is not conducive to high standards of work and is lacking in even elementary facilities. The library provision is meagre in the extreme and cannot contribute to the development of a student's research capabilities. The whole place needs cleaning up, more equipment, more books and greater design expertise.

4.1.31 There is evidence of the problems caused by students graduating into teachers, without an intervening period of practical design experience.

4.1.32 Several members of the Faculty took the trouble to visit me at the EIDDC Pyramids Institute in the evening to discuss proposals for Masters degrees which they wished to take. We had a long discussion and I believe that, as in the other countries visited, they would respond to "coaching" in the subtleties and deeper appreciation of the art of Industrial Design. There is no lack of goodwill or good intent. However their proposals to offer higher diplomas in design seem to be confused in their thinking and lacking a sufficiently secure base. The proposals are:

(1) "Design Activities", which I take to mean professional practice and promotion but I am not sure, and this is seen as a step towards a Masters degree in the subject;
(2) "Design Information";
(3) "Design History";
(4) "Design Philosophy", aesthetics, product behaviour, etc.

These have yet to start and I do not see evidence of staff available to run them.

4.1.33 I made a point of visiting their library which was small for the size of the College, not well cared for, and totally lacking in the necessary subject titles. Such few books on design as are available are mostly old and unrelated to each other - so that there is a very odd choice of works available to the students and even this meagre choice, I was told, has been donated privately by members of staff.

4.1.34 The conclusions drawn from this visit and the others so far is that there is a desperate need in all countries

visited for a comprehensive balanced library of works on design and related subjects. It must be a matter of priority to create a suitable book list - using the experience of Art & Design academic libraries - and provide unit libraries of, say, three to five hundred books. These should be housed in units designed to hold them in a suitable manner, with pre-prepared catalogues, and comprehensive notes on how to maintain, run and use a library; and also hopefully how to add to the basic collection which should be seen as the nucleus of an institutional library.

4.1.35 Another important need is the establishment of an ICSID/UNIDO list of definitions for certain design terms. There are now many uses of the term "design centre" which do not conform to the general understanding of the term usually used in the developed countries. The result which can be clearly seen in Egyptian-English usage is a series of incomprehensible terms (both ways) which lead to misunderstanding and misinterpretation, which we cannot afford as this does not contribute to the cause of a better appreciation of design.

4.1.36 Industrial visits in Egypt were limited but a meeting with the Sales Manager of IDEAL produced valuable confirmation of the situation existing. IDEAL (pronounced Idi-al) make two main types of household goods - refrigerators and washing machines as one group and metal furniture as another. They make four sizes of refrigerator: 7, 8, 10 and 13 cu. ft. These are now 100% Egyptian manufacture and more or less 100% Egyptian design, being the developed descendants of a fifteen year old licensing agreement with Bosch of Germany to produce their then existing models (long since defunct in Germany) under license. This development has been carried out by their own design staff which consists in the main of graduates in electrical and mechanical engineering, but includes some graduates of

the College of Applied Arts, departments of industrial and interior design, and a few from the fine arts department.

4.1.37 They also manufacture a simple washing machine - a tub with a basic form of pulsator which sells for six Egyptian pounds, and are about to start making under licence from Hoover of England, their twin-tub semi-automatic washing machine. This will start as an assembly of imported English components but the intention is to replace these gradually with locally manufactured items. The accepted fact is that in the main Western models of the mid-fifties are most applicable to the present state of the majority Egyptian market.

4.1.38 Trying to avoid the use of leading questions, I probed the suitability of Helwan graduates to industry in IDEAL's experience. It is taken for granted that all students need a period of further training and experience before they can become useful designers. The length of time being related to the aptitude of the student but four or five years is considered normal!

4.1.39 However the shortcomings described are significant: "They do not concentrate on detail, or production" and so many design modifications are necessary. With kitchen furniture and equipment "more care in details of construction and a greater knowledge of manufacturing processes is needed". This supports my impression of the narrowness of the outlook of the course and the failure to concentrate on <u>finish</u>.

4.1.40 A lecturer of the College who took a Masters on IDEAL furniture production spent six months with the firm learning their language. His thesis was highly thought of because of the sound basis of knowledge of production methods and techniques that this stay produced. "We need good designers in Egypt" was the concluding statement.

4.1.41 At Helwan, very few of the thirty students per year fail their final examination - two or three I was told. This on the basis of what I saw shows a disquieting lack of academic rigour, and all graduates in Egypt are found jobs by the Government I was also told. However as industry cannot, at this stage of development, absorb thirty or so designers, where do they go?

4.1.42 It might be as well if the output was related more nearly to requirements and the standards raised by concentrating such limited resources on those most likely to succeed. This would be a logical course to pursue and would speed the process of developing the industrial design profession in Egypt.

4.1.43 A meeting with Mr. Ibrahim Sharkas, a Deputy Minister and Head of the General Organisation for Industrialisation - G.O.F.I. - and also Head of the Controlling Committee of the Engineering and Industrial Design Development Centre was useful. The role of the industrial designer and the aim of the present mission was explained and were well received.

4.1.44 I took the opportunity to stress the need for both promotional and professional membership of ICSID as they have already said that the lack of proper channels of communication is appreciated. As Governmental approval of membership of international organisations is required, it seemed as well to point out the need for a professional society as well as EIDDC if the cause of design is to prosper in the land of Egypt.

4.1.45 Several attempts have been made in the past to form a professional Society, so far without success, but the indications are that following my visit a new attempt will be made, and perhaps it stands a better chance of succeeding.

4.1.46 Dr. Eng. Yusef K. Mazhar spends much of his time attending seminars and on overseas visits, and delegates all detail arrangements to subordinates. He was not able to spend any personal time with me on visits, unlike the heads of design organisations in the other countries. He very properly emphasises the commercial and financial aspects of design but, perhaps not unnaturally, he is not fully conversant with some of the more subtle problems and aspects of the development of industrial design.

4.1.47 UNIDO funds form only part of the income of this UNDP sponsored EIDDC. The funds obtained from Switzerland and West Germany outweigh the UNIDO contribution.

4.1.48 The Industrial Design Section is, in fact, only 4%, in staffing terms, of the whole Centre. Mohammed M. Kamal Eldin is head of the design section. He has limited practical experience but is capable of running a section. A graduate of Helwan, he has a feeling for graphics which he works on in his "spare" time.

4.1.49 To return to the two-job syndrome, Dr. Ata of the Interior Design Department of the College of Applied Arts at Helwan University told me that he can only afford to spend the minimum amount of time in his Department - the bare contractual requirement in fact - because of the poor rates of pay. He must therefore devote most of his energies to his private work. This means that almost everyone is trying to do too many things in the time available with the resultant deterioration in standards, and divided loyalties.

4.1.50 It is necessary to comment on my programmes for the week as waste of time was a regrettable feature, and it was only possible to accomplish about 25% of the work in the same period of time as elsewhere. The programme was never quite clear or definite and was

subject to continual change. Their anxiety to keep me to themselves at the Engineering and Industrial Design Development Centre, whilst flattering and perhaps understandable, was nevertheless unhelpful and owing to transportation difficulties there was little one could do to change the situation. Whilst the information gained is sufficient, I would have preferred to have made more contact with manufacturers and chambers of commerce as elsewhere, and to hear a greater variety of views and questions. The only comprehensive meeting, planned with the Institute of Packaging, was cancelled because, I was told, many members had gone to Alexandria. There was a perfectly good week in which it could have been arranged and they had as much notice as everyone else on my itinerary. Being conducted by the same person for a week represents a great effort on his part but does not help one to collect a sufficient breadth of news and views on the subject.

4.1.51 Because of the knowledge gained in India and Pakistan, I have been able to ask suitable questions and fill in the gaps in the explanations given and make a fair assessment of the state of things by a general awareness of what goes on around me. It would have been a different story, however, if this had been the first port of call on the mission. It would not then have been possible to obtain a clear picture.

4.1.52 As the staff of EIDDC were occupied with their monthly management meeting on the morning of Saturday 25th March, I was taken to the Dar-el-Salaam Centre, which forms the other part of the EIDDC. Here I visited the tool and jig making workshop which is very well equipped with a wide range of international machine-tools and is therefore capable of producing highly sophisticated patterns, moulds and tools and testing them. They have measuring and testing laboratories which are also well equipped.

4.1.53 The "product design" group, as distinct from the industrial design section, are based at Dar-el-Salaam. When visited they were working on a 'bus project, a water heater and a washing machine; the latter being dealt with on a more "nuts-and-bolts" level than those being designed in the industrial design section. The mechanical engineering level seemed about the same however in both groups. This represents a pointless duplication of effort and can only damage the development of good standards of design.

4.1.54 The water heater project gave cause for concern as no satisfactory answers to my questions concerning safety were forthcoming. There was no expansion outlet or safety valve. I was told that these were not necessary on a non-pressurised type of water heater. The engineer in charge being of the opinion that the pressure in the vessel was the same as that of the water supply as there was no inlet valve, and also that they were working to British Standards. I pointed out that since no such apparatus could be directly connected to the water supply in Britain, something was wrong somewhere. The British "Standard" was then produced, but it turned out not to be the "British Standard Specification for Water Heaters" but the "British Standard Code of Practice for the Installation of Water Heaters". This again brings out the lack of adequate and systematically organised reference material - this is an important issue demanding immediate attention.

4.1.55 The 'bus design which I criticised as not being an advance on present vehicles, which do not cater for the passengers needs (see Karachi) was started, I was told in the industrial design section and then transferred to "product design" for further development. This introduces the isolationist system of large organisations in the West into an Institution which should not make the same mistake. The 'bus project was originally lead

by a Yugoslav expert, a mechanical engineer - who pursued an engineer's approach to what is basically a problem of people and their behaviour, not nuts and bolts.

4.1.56 The "product designers" approach when asked to design an injection-moulded front grille to a small air conditioning unit, was to produce a mechanical design - straight sided with no withdrawal angles for the moulding tools. I was told that if the "design" of the grille was accepted by the manufacturer then the tool allowances would be included in the parts drawings. This shows another example of the failure to grasp what design means and that problems are being tackled in independent stages, thus ensuring the lack of any real innovative design from the harmonic combination of structure and materials.

4.1.57 The answer to the code-of-practice/specification problem is the availability and use of properly arranged reference material. British Standards and German and American Standards could be provided to give an indication of practice in the developed countries and act as check lists and guides to designers starting to investigate similar products. Such works should be included in the basic reference libraries.

4.1.58 Educational improvements will take some time but EIDDC staff are on the faculty of the College of Applied Arts. Equally important is that an attempt should be made to make the faculties of engineering more aware of the meaning of and need for industrial design.

4.1.59 The leader of the Industrial Design Section complains of the lack of time allowed for product development. When a manufacturer comes with a project he expects quick results. This is the normal attitude, of course, but with comparatively inexperienced designers facing really basic problems of design development this causes

real problems.

4.1.60 The section has two interior designers who joined them from the disbanded small industries organisation (4.1.10) who had gained little experience in the previous five years and this does not help the productivity of the section which the Director described as unacceptable at its present level. There are therefore only four or five industrial designers and their output is low. The project availability therefore exceeds the design capability. The incentive to greater productivity is a bonus scheme which can amount to as much as one third of the monthly salary, and is related to the income of the department. The inclusion of less-skilled members in the section does not encourage good team-work and therefore cannot aid greater productivity.

4.1.61 My view that product design should be based in the same building as industrial design was warmly received by Kamal Edin but not so enthusiastically by the Director who talked of his many problems, of which this is only one (4%).

4.1.62 Note: The World Intellectual Property Organisation which has links with the Austrian government claims the ability to give state-of-the-art information to developing countries by reference to patent specifications, etc. The address of W.I.P.O. is 32 Chemin des Columbettes, 1211 Geneva 20, Switzerland. Dr. Mazhar proposes to put this claim to the test in respect of washing machines information and the result should be checked.

4.1.63 Whilst people were generally friendly and tried to be helpful in most cases their English only permitted a very limited understanding. The programme was not well thought out and this led to a considerable wastage of time. Two days would have sufficed for the work

done. The Saturday afternoon was set aside for the Packaging Institute meeting but this never took place and when I was informed of this, it was too late to replan the day. The last meeting with Dr. Mazhar scheduled for 11 a.m. took place after 12 noon. This meant that the only visit to the Dar-el-Salaam Institute was unnecessarily rushed. Promises as to what was to be done at the beginning of the week remained only promises and there was never any serious attempt to follow them through. When the Cairo office of UNIDO handed the responsibility for programme to the Engineering and Industrial Design Development Centre, they did a disservice to my mission as it effectively prevented me from seeing organisations outside their system. But for the fact that two of the staff of Helwan University are personally known to me and had arranged for me to visit their faculty and students, it is unlikely that this part of the investigation would have taken place.

4.1.64 The EIDDC has some positive achievement to its credit but it is proceeding on dangerous lines that could seriously impair the development of an independent design profession in Egypt. They will be reluctant to surrender design projects to other designers or design teams when the development and prosperity of their Centre, and their own, thanks to the bonus system operated, is at stake.

4.1.65 The shortness of time allowed by clients to develop design projects, the poor output per head of staff and the difficulty of maintaining a concentrated effort, as described in the Director's Paper (No. 4) are not conducive to the solution of design problems, and the Director's perhaps understandable insistence that he will do nothing to increase the number of staff until productivity has increased means that the problem of improving the situation is a considerable one.

4.1.66 Fundamental office discipline and practice need to be established if output is to be significantly improved, and realistic programmes and production targets need to be set. Time should not be wasted but no-one will thank this Centre for skimped appraisals and half-solutions of design problems. If manufacturers are in too much of a hurry then they must be told so and made to realise what are the requirements for proper design solutions. This is not easy - but it is part of the duties of the designer and the design profession.

4.1.67 Dr. Eng. Mazhar's paper "Development of Industrial Technology through Specialized Centres" contains much useful information on the problems of encouraging design activities in developing countries which is of general interest and application quite apart from his detailed description of the development of EIDDC. In particular I would draw attention to his remarks concerning the problems surrounding the selection and use of visiting "experts", and I have therefore included his treatise as Paper No. 4.

PAPER No. 4:

DEVELOPMENT OF INDUSTRIAL TECHNOLOGY THROUGH SPECIALIZED CENTRES

by Dr. Eng. Yusef Mazhar

Developing countries have, in their efforts to improve living standards, tried to industrialize as fast and as far as possible. Sooner or later they stumble against what they all now believe to be the biggest obstacle towards industrialization, "technology". Many believe that once technology is transferred or developed, no serious obstacles are encountered.

At this stage different prescriptions are offered. Turn Key plants set up are ready to work with a push of a button, licensing and technical "know-how" are offered for sale, technical assistance can be made available. Industrial development decision-makers are dazed by this complicated array of quick and comprehensive industrialization.

There are, of course, those who also offer advice in so far as saying"why don't you try and do it yourself?". With assistance of course. The idea is no doubt appealing and immediately a number of solutions are offered with the objective of enabling developing country's industries to try and develop some of the industrial technologies they need.

The form suggested is usually an institute or a centre. Institutes of course also have different forms and varied objectives and functions. The main sub-division may appear to be "multipurpose" or "unipurpose" institutes. The former carry out work in a number of industrial fields. Specialized institutes concentrating on one discipline, or institutes devoted to the develop-

ment of a particular product or process are in the latter category. Another form drawing on scientific disciplines and social sciences and working in the area of management are sometimes classified as "comprehensives"; these are not really the object of this article.

How do institutes or centres involved in adaptation, modification or even development and innovation of technology function? Have they achieved their objectives? What are the "success" or "failure" stories.

This exercise, if implemented will give decision makers in industry a chance to evaluate their policies and enable them to see clearly what they can expect when they rely on centres or institutes for technology development.

Among the different centres/institutes in this field (industrial development) are industrial development, industrial research and design, industrial planning, etc. Further, along the way to specialization are textile development institutes, metallurgical, electronic, engineering and iron and steel. These types of institutes can really be considered adjusted to particular industrial subsectors where technologies are of a related nature. Further specialization leads to packaging development institutes, etc.

With a particular objective in mind, institutes may take the form of transfer of technology institutes, appropriate technology or even export promotion institutes.

Any study trying to cover the viability or effectivity of such a wide spectrum of institutions would have to be undertaken by a large institution or preferably a U.N. body.

A modest contribution will be made in this article with an expose of a centre which has now been active for a number of years, since 1969, and has made a major contribution towards the cause of industrial development through development of engineering and design in an advanced developing country.

The Engineering and Industrial Design Development Centre (EIDDC)

EIDDC was established in 1969 as a joint project between the Government of A.R. Egypt and United National Development Programme (UNDP), with the United National Industrial Development Organization (UNIDO) as executing agency.

Phase 1 of the EIDDC's project had as its main purpose, to train designers in products development , to develop industrial products design capabilities and to assist in development of tools manufacturing capacities, as well as to assist in the development of capabilities for technology for manufacture and processing. In Phase 1, concentration was mainly on the engineering industries, through the work expanded to other types of industries. The work of EIDDC following the main objectives although there was large demands for complementary activities in the field of industrial design development. The work plan of the project has been followed as closely as possible in spite of the changes in the Egyptian industry, and the growing demands. To fulfill the requirements and the main objectives, some new activities had been introduced; plant layout studies, heat treatment and material tests.

During these first five years, considerable experience was accumulated as to the real needs of the industry. The Centre also faced some problems as is the case of any new project. These difficulties have been summarized for reference:

a) Difficulties of training of local staff in design and related engineering work. Previously most engineers were adjusted in industry to production, maintenance, etc. Design work was minimal.

b) Difficulties in getting engineers to work at the Centre due to wage differentials in industry.

c) Adjustment of the experts brought in from developed countries to the conditions of the country, industry and the Centre's work.

d) Acceptance problems in so far as industry was sceptical and mistrustful of the Centre's engineering and design capabilities.

e) The limited number of contracts (unpaid) left a relatively small impact on the large industrial spectrum, leaving the Centre relatively unknown.

f) Problems with local counterparts to the experts, as some, especially on managerial level, did not originate from industry proper but were civil servants.

However, in spite of these difficulties and problems, the first five years did produce positive results and achieved the following:

a) Established a core staff of engineers and designers who with the aid of fellowships and experts coaching possessed the basic skills needed for further development of the Centre.

b) Introduced to industry the concept that an outside establishment could contribute to solving their problems in product design, processing engineering and tool making.

c) A design system was established within the Centre where design work could proceed correctly on a scientific basis from one stage to another, according to present plans.

d) An industrial concept of work was achieved and industry became aware of the long preparation and time needed before a product emerged on the production lines of a company. The correct sequence of

product identification, design, complete documentation, process design, tool design, prototype building and tooling for final production was established in a number of factories.

The Second Phase started in 1973 when the long-range objectives of the Centre were altered to develop further industrial products design capabilities within the country, to assist in the development of capacity for manufacture of tools, as well as to develop capital goods equipment design. This was considered essential as the country had already achieved considerable industrialization.

According to these long-range onjectives, the Centre was re-organized to work on the following main activities:

a) Industrial product design and development (industrial design was introduced)
b) Production technology and tool design
c) Process design
d) Mechanical workshop and prototype building
e) Heat treatment workshop and mechanical laboratories
f) Factory and plant layout
g) Capital goods equipment design for food, chemical and petrochemical industries.

Divisions dealing with training., industrial information and documentation were intorudced as well as separate financial and administrative division.

Phase II introduced the following new aspects which were essential to develop the Centre and progress from the limited activity of the first Phase.

Among these new aspects, the following are noteworthy:

a) Granting of autonomy from the Governments side with an independent management as well as establishing

a separate financial and administration division.

b) Expanding the Centre's activities horizontally to expand activities in plant layout and new factory design.

c) Introducing a new field in capital equipment design according to the changing needs of the country.

d) Complementing the picture of industrial development and providing technological information though an information and documentation division. A vital issue neglected during Phase I.

e) Vertical expansion of activities with more concentraded efforts to strengthen technological capabilities. More specialized experts.

The status and policy of the Centre today has been dealt with in an article in the previous issue.

A Centre such as Industrial Design EIDDC must rely to a large extent on building up a large staff of highly skilled individuals in the basic specializations needed.

It is believed that the main basic requirement of staff to be recruited by the Centre should be for:

A. Junior Newcomers with:
   a) good basic education and acceptable grades;
   b) interest in field of work;
   c) a creative attitude and readiness to develop.

In order to be able to acquire certain technological skills in specific industrial areas, the Centre must recruit:

B. Senior Newcomers with:
   a) basic educational requirements of the post and extensive experience in the field of competence;
   b) interest in the activities of the Centre and commitment to its cause;
   c) managerial and creative ability.

In the case of junior newcomers who are usually university graduates, their further development takes place along the following lines:

a) On-the-job training for approximately one year where the new staff members have a chance to pick up information from their colleagues and from the experts attached to the Centre.

b) Most new staff members attend the Centre's own training courses for industry and can attend other courses outside the Centre if needed.

c) The most useful development is accomplished by actual interaction with industry. Engineers spend a great deal of time within industry on the Centre's assignments.

d) A fellowship is planned for new staff members after about one year from joining. Fellowships vary in duration from six months to one year and are usually within industry in developed industrial countries.

e) Further development is ensured by short-term study tours during their career and which are planned for every second year. These study tours are also in developed countries.

f) Staff are encouraged, in addition to their work, to make use of the information and documentation Centre and work on translations to the Arabic language of new literature to enlarge the Arabic technological library.

What are then the manpower problems. Some have been listed below:

a) Getting the best people is always a problem. Egypt does not have a problem of quantities of manpower. The birth rate and the educational system contribute to making hundreds of graduates available for work each year. But getting the people with the characteristics shown in the previous paragraphs is difficult.

b) Technology development work in general and design in particular, needs certain qualities as accuracy of work, patience and perseverence. The Mediterranean area temperament and local inherent characteristics of individuals does not always conform to these requirements.

c) There is always a turnover of staff, i.e. staff wanting to leave for higher salaried areas of the Arab world. As long as the percentage turnover is under control, there is no problem. But there is always the possibility of the situation getting out of control.

d) Engineers and technical staff are not trained in information and documentation techniques. Time is lost in searching for information in a disorganized way.

e) Motivation is always a problem. Technical staff working in the design of complicated industrial products are often disillusioned by the gap between their local capabilities and what the industrially developed world is doing. Production techniques open to them are limited, hence designs have always to be adapted or simplified. Work can often be frustrating, hence the motivation problem.

The above remarks are generally valid for the main responsible staff directly involved in industrial technology work. However, manpower working as auxiliary or assistance staff have also some problems. Draughtsmen need to be developed and trained: it is necessary to bring them up to a level accuracy and responsibility so that they take their share of the design work. As design work means prototype manufacture and testing of new products, processes or technologies, the Centre has large workshop facilities; here again development of top lathe turners, mechanical fitters, grinders, etc. is not an easy job.

After these skilled workers are trained they sometimes use their acquired skills for extra external evening jobs which no doubt has a bearing in their main work at the Centre.

One of the acknowledged ways of transferred information for technology is by experts. This project has over the period of UN assistance had the services of a number of experts of various nationalities and who had contracts for varying periods of time. On the average, the period of stay was over two years at the start of the project.

The experience gathered can give some interesting indicators about the effectiveness of experts.

The main advantages of the use of experts can be summarised as follows:

a) The expert has direct contact with his local counterparts and can greatly influence their skills and technical knowledge.

b) Competent experts can also influence behaviour patterns and work modes of the local staff as far as accuracy of work, thoroughness and even punctuality.

c) In the case of experts devoted to their mission, a great deal of material may be transferred from the expert's home country or even place of work to the project in a developing country.

d) Clever counterparts may reach high levels of competence even equal to the teachers.

e) Some experts have even been involved in having local technical staff to be trained in their own countries and their own industrial enterprises.

f) One expert can influence, instruct or train a large number of local staff with a multiplier effect to that a large number of skilled locals can slowly take over the duties of the expert.

However, this may not always be the case with all experts and cases vary according to the willingness of the counterparts to learn, the effort made by the expert, the local environment of the project and the personality of the expert.

Some shortcomings in the use of foreign experts are given below, with the objective of identifying pitfalls and improving the use of experts.

a) The expert needs time to settle down, find a place to live and adjust to local living conditions. This takes considerable time in some cases.

b) When departing, the expert loses time again in writing final reports (considered part of his daily work), farewells and packing. This varies from expert to expert, but may represent a considerable loss of time.

It is estimated that in a year's contract, an expertise loss between item (a) and (b) may vary from a total of one month up to three months, where variation depends mainly on the expert, but also on the local management, the environment and other elements relating to the agency or institution the expert comes from.

c) Some experts may work aloof and find difficulties in establishing a working dialogue with their partners.

d) In remote cases experts may try to hang on to their jobs by making themselves indispensible so that their contracts are extended.

e) Again in limited cases special work peculiarities of the expert may be reflected on the counterparts. Slow work and extended scheduling of work is an example of this. It is remarkable how counterparts pick up the good and the bad personal and work habits of an expert.

f) Experts may be stingy with their knowledge, transferring it drop by drop to the local counterparts and not exposing sources of materials and information. This kind of attitude may be the most unforgivable of all.

g) Strangely enough the main responsibility of all may lie on the local staff and management. If management does not make good counterparts available and insist on the learning and absorbing, and if management is not demanding on the experts to exert more effort and meet objectives, then transfer of knowledge and technology will be greatly jeopardised.

In the writer's opinion, however, in spite of the previous rather critical presentation, experts and consultants remain a useful and effective means, if aware of the shortcomings, and sufficient effort is made to overcome them.

Does the Centre have a philosophy for its training programme? Yes; it has indeed. The philosophy is "training to meet the specific changing needs of engineering design and industrial development". Maybe this is an ambitious statement, but actually training programmes are drawn up according to the following policy:

a) Specialization courses are mainly concentrated on industrial engineering subjects and related technologies.

b) Flexibility. In so far as new courses are planned annually according to the actual technological requirements of industry, and the particular problem areas as identified in industry.

c) Intensive and relatively short courses. Mainly at the request of industry and short enough not to disrupt production by the absence of staff leaving their jobs.

d) Ample printed material, so as to encourage participants to read the background literature, as well as to make up for local shortage of text and reference books. The material is also designed as future practical references to be used by participants in their jobs.

e) Case studies and discussions are encouraged. Participants are asked to bring their problems from industry for discussion.

f) Transferring new technologies, which the Centre has become aware of, so that industry is exposed to new developments all the time.

In fact, the Centre relies intensively on its training programmes, which are well advertised, for assuring constant contact with industry, establishing its image, and obtaining more design and development consultancy assignments.

Being situated in Cairo, at the centre of the Arab world, the Centre has been directly involved in various activities in the area. This has been directly and also through the different Arab Regional Organisations in the area, as well as though the bilateral agreements with other Arab countries. Some examples are given below:

a) Participation in a regional study of the electrical industries in the Arab World in collaboration with the Industrial Development Centre for Arab States, IDCAS. This involves sending study teams to Arab countries for study and information gathering. An Arab meeting for electrical industries was later held in Cairo which discussed and reviewed the situation of the Arab electrical industry. One of the recommendations of the meeting was the setting up of an Arab Federation of Engineering Industries.

b) The design and running of a training course in Industrial Product Design for Arab engineers in

collaboration with IDCAS and the Ministry of Industry in Baghdad, Iraq.

c) A study and design of the Specialized Institute for Engineering Industries in Baghdad, which included the organizational set up, area and equipment requirements, workshop and laboratory design, etc., services also included training of personnel.

d) Training of engineers and technicians of the Industrial Development Centre in Riyadh, Saudi Arabia.

e) Preparation and running of a training course on tool design and manufacture for Iraqi engineers in Baghdad.

f) A working agreement exists between the Centre and the Industrial Development Centre in Khartoum.

g) Participation in a number of regional seminars on industrial information and documentation organised by IDCAS.

Many other activities on Arab level are on record and the Centre is being increasingly involved in Arab industry.

The training courses run every year are now well attended by Arab engineers.

The present stage of development of the industry in the A.R. Egypt further required more sophisticated technical and technological work aiming at achieving an acceptable economy of production. This work has to be done through:

Work Programme

a) Promotion of transfer adaptation and use of appropriate up-to-date technology;

b) better utilization of capacities;

c) introduction of new products and/or production methods;

d) planning and/or replanning and organisazing the plants; and

e) introduction of up-to-date industrial technologies, methods and systems.

The industrial development policy of the A.R. Egypt underlines the great importance of the rationalization of production as well as introduction of new production and industrial technologies and techniques. Therefore, the future development scheme of EIDDC has to have as its main task the fill the existing gap in the requirement of the industries and industrial development with introduction of industrial consulting and at a later stage, contracting services in the field of mechanical engineering for various industries.

Investments are available for the establishment of new enterprises aiming to boost the country's economy. Following the new economic policy, the industrial development plans include the public and the private sectors as well as give opportunity to joint venture investments with foreign investors.

On the other hand, rapid advances in engineering science, technology and industrial technology are permanently opening ways for improvement and further development of the industrial production. The results of such achievements and experiences have to be followed closely and used in the execution of the industrial development plans of the A.R. Egypt. Therefore, the proposed future policy of the Centre should be aimed at:

a) rendering technical and technological assistance to achieve better efficiency lower cost of production (through better utilization of capacities, introduction of new products and production methods, planning and re-planning and organizing of the industrial plants, etc.);
b) promoting the transfer and use of appropriate up-to-date technology;

c) developing the highly specialized industrial consultancy and at a later stage contracting services; and

d) promoting capabilities on the long run to render combined services (technical, economic, managerial, etc.) which will have a positive impact on the development of the industry. Promotion of these capabilities should be stressed upon due to the new open-door policy of the country.

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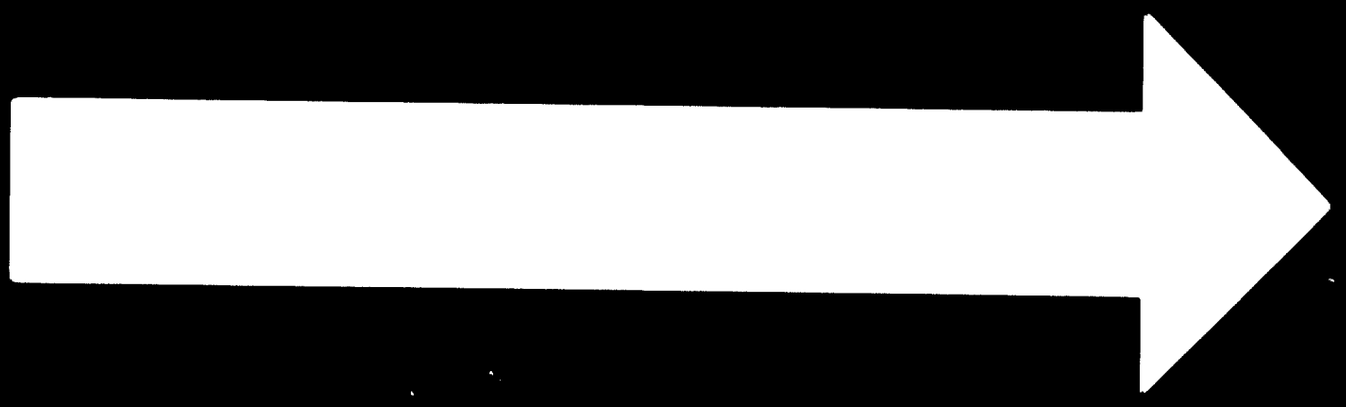

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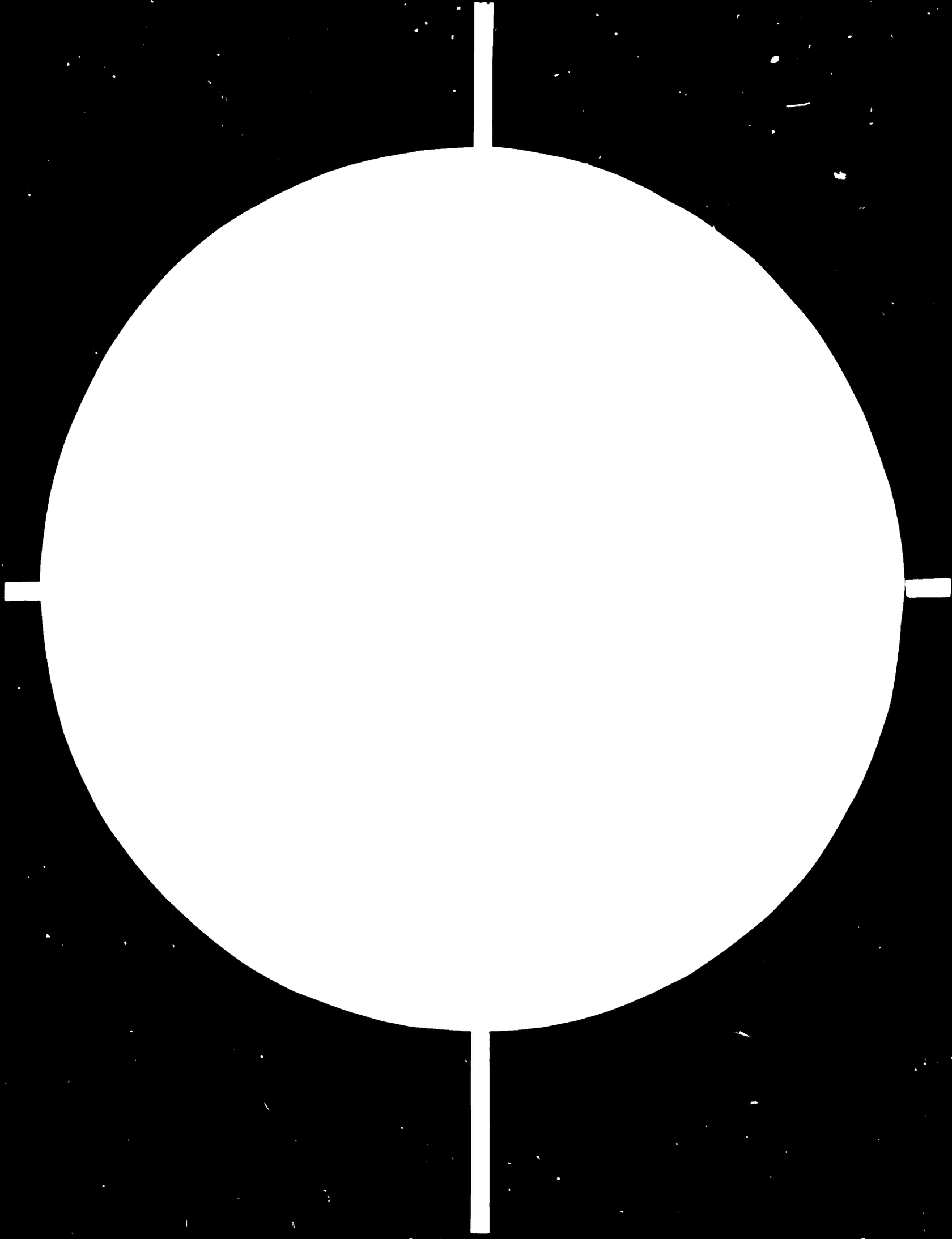

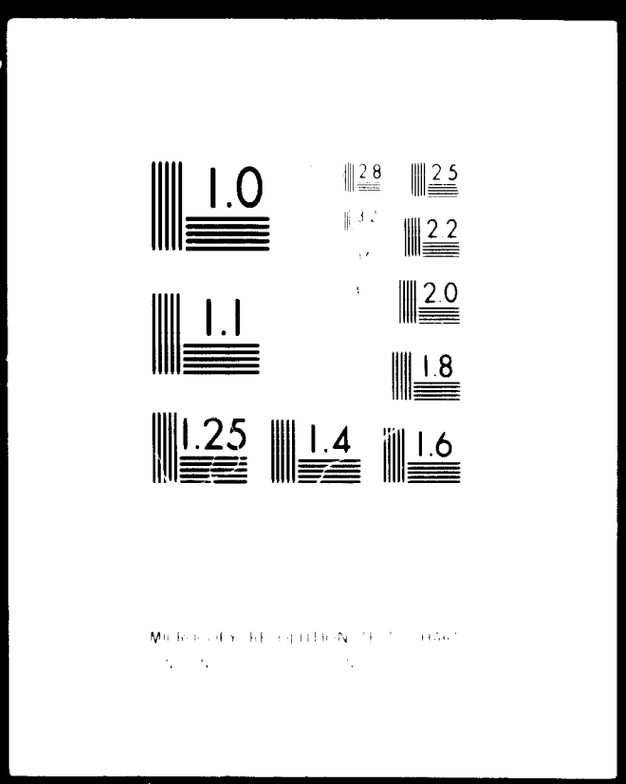

ANKARA - Capital of Turkey

5.1.1 The mission to Turkey started on the 27th March 1978 with a discussion at the UN office in Ankara on the tentative programme they had prepared. The, by now, usual misunderstanding as to the nature of industrial design was first cleared up, but as there was no link of any sort with the design activity with which the mission was concerned, there seemed no alternative but to go along with the suggested programme of inappropriate meetings. I asked to visit the Middle East Technical University, METU, and this in the event proved to be most rewarding.

5.1.2 On March 27th my first visit was to the Chamber of Industry where I met Mr. Mehmet Yazar of the Hase-i Machinery Trading and Industry Co. Inc., President of the Chamber which especially includes the private sector; there are many large State organisations in and around Ankara; and the Chamber has one thousand members, mainly small companies, in this area.

5.1.3 As far as industrial design is concerned, he confirmed that there is no central organisation, either state or private, to cater for it. Some companies do have their own design sections although in the main these seem to be engineering designers. The accepted method is to manufacture designs under licence agreement with

foreign companies and to develop and adapt products to local needs and conditions.

5.1.4 Continuous development seems to be the policy adopted by most firms. For example, tractors were originally manufactured under ten year licences from FIAT and Massey-Fergusson, but Turkish companies have now graduated to the design and manufacture of their own types, especially in the case of small cultivators, which need adapting to the local terrain and farming methods.

5.1.5 Government regulations concerning foreign currency makes difficulties for licence agreements and Mr. Yazar cited the case of his own firm, which manufactures a large range of water pumps which are used mainly for irrigation purposes, who had been unable to pay Vogel of Austria, the originators of their pumps, their 1½% fee for over one year. He told me that nevertheless Vogel had been very understanding and had continued to supply information and expertise during this period.

5.1.6 Foreign currency problems also cause bottlenecks in the indigenous manufacture of machinery and components. His firm had been waiting for additional machinery needed to increase production due to currency restrictions, and further delays by customs after the equipment had been purchased. The only part of his firm's production which is not one hundred per cent Turkish manufacture are the roller bearings used, as there is no Turkish source of supply.

5.1.7 Mr. Yazar's firm is a family company and was founded in 1969, he himself is a mechanical engineering graduate who was previously employed in a State enterprise. His firm currently employs 100 workers and this number will soon be increased to 140 when their new foundry goes into production. They moved to their newly-built

factory a few miles outside Ankara on the Istanbul road about one year ago, having previously used old, smaller premises in Ankara. The factory is well-organised, clean, efficiently run and with a very good works canteen serving substantial, well-cooked meals; and they emphasised the care they take over this aspect of their activities.

5.1.8 As they are located near to a military airfield, they are not subjected to the daily electricity cuts of up to two hours or more which are a feature of daily life in Ankara (the UN office uses its own generator during these periods). But as Mr. Yazar says, the problems of currency restrictions and the shortage of electricity are problems which the Turks must solve for themselves.

5.1.9 They concentrate on irrigation pumps and have developed new models, strengthening them for the rugged conditions which prevail on Turkish farms, and adapting them to a variety of forms of propulsion. Direct tractor drive being the most popular as it is the main motive power source on most farms, but also belt and gear box driven, and electric or diesel motors of local manufacture drives are provided for. Also to cater for a greater head of water, up to 40 metres, than the original models delivered. At present about fifteen small sub-contractors supply them with castings but their new foundry will have much greater capacity than they need and so they will soon supply all their own needs, and they are considering diversifying into other types of agricultural equipment.

5.1.10 The foundry has been designed by their own engineers and is now nearing completion. It is a very competent piece of work. Mr. Hikmet Caltug, who was responsible for the design of the foundry, said that in Turkey, engineers must be generalists and capable of dealing with a wide range of problems.

5.1.11 Although it is a family firm, the principal engineers on the staff have been taken into partnership, most of them being university class-mates of the owner originally. There are four of these, the general manager, the construction manager, etc. The family concern includes other companies, one of these a marketing company with distributing agencies throughout Turkey. Their quality control at all stages of manufacture is good and their testing methods thorough. They claim that the best skilled Turkish labour is working abroad, but they seem to be managing well enough with what they have, although I understand that a lot of supervision by skilled engineers is constantly required.

5.1.12 This is a flourishing company concerned with maintaining standards and increasing output. Clear thinking and able, looking after all aspects of their trade. They are developing and adapting intelligently and do not seem to be any longer in need of outside assistance.

5.1.13 I next met Dr. Salim Ciraci who is mainly concerned with the development of a very large diesel engine project which does not fall within the scope of this mission, but we had a useful discussion during which he told me that political troubles in the university over the past few years have led to a shortage of skilled graduates, and that mechanical design capabilities exist and are used to adapt foreign designs to local conditions of manufacture and use. This meeting, therefore, served to confirm the information previously gathered.

5.1.14 On the 28th March I met Gunay Gungen of Makina ve Kimya Endustrisi Kurumu, MKEK, apparently the largest state-owned organisation in Turkey with some seventeen factories and 17,000 workers. Many of these factories are concerned with machine tool manufacture and others with textile machinery , earthmoving equipment, and so

on: much of it made under licence but some is to their own designs. MKEK have a special one and a half year training programme for graduates who serve a three year contract after the training period, but it is possible for a trainee to "buy himself out" before that. Attracting the right type of graduate in the comparatively low government-regulated pay scale is a problem, and most graduates seek employment in the private sector or abroad. Mr. Gungen thought that nineteen years ago when he was a student there was less emphasis on practical work but a far better theorectical training was provided. Many of his classmates have been extremely successful abroad.

5.1.15 I then went to the Middle East Technical University where, not having any specific contacts, I asked to meet the chairman of the Department of Industrial Engineering, Dr. Omer Saatcioglu. He explained that the University had as faculties Engineering, Administrative Sciences, Agriculture, Arts and Sciences, and Architecture. From him I learned that the Faculty of Architecture had attempted to start a department of industrial design. This had been turned down by the University Council partly because of lack of staff and resources but it was also hampered by the political troubles of recent years.

5.1.16 The University has just re-opened following a one-year shut down and had now been re-organised.

5.1.17 He said he liked the idea of such a course but wanted it in his department, not in Architecture. His department currently had four hundred students and only ten staff, although eighteen would have been available but for the political troubles. We discussed staff salaries which, as in the State enterprises, are low - 10,000 Turkish lira nett per month - equivalent to about 400 U.S. dollars - and this does not make it easy to attract the right calibre of person, as in the private sector

a graduate can earn four times this amount. We discussed the interdisciplinary nature of industrial design and he thought that the flexible attitude to courses in METU should help the development of a suitable course.

5.1.19 His sector on industrial engineering is essentially a problem solving course as distinct from the purely mechanical or electrical engineering courses, etc. They already have a small ergonomics laboratory which they are extending and the staff I spoke to seemed to be capable and aware of how to use the equipment, and everything I saw was clean and efficient. Their development plan takes them up to 1990. I was impressed at the general level of competence in this department.

5.1.20 I next met the Dean of Architecture, Ceuat Arder, the first elected dean under the new organisation, and he also introduced Mehmet Asatekin who, in fact, joined the staff originally to be part of the proposed industrial design department. He is one of two members of staff primarily interested in the subject, and the other is currently working for his doctorate in Denmark.

5.1.21 The School of Architecture was founded in 1956 with American assistance from their AID (Agency for International Development) programme and the Ford Foundation. It was part of the original intention to found a department of industrial design by 1969. The Americans appointed David K. Munro to help start a department and he arrived in 1969. He worked for two years training the two assistants referred to above and developing a number of reports, the last of which was published in 1971. This coincided with the problems of student unrest and a lack of support from the University Council, so that little further progress has been made. However the two assistants have kept the scheme alive and have offered industrial design as one of the options open

to the architectural students. This is little more than an industrial design appreciation course as it can occupy no more than three hours per week. Mr. Asatakin has therefore recently restyled the course to be more lecture based than project orientated as he thinks, rightly in my opinion, that this is a more realistic line to take in the circumstances. Nevertheless the student projects that I examined were of a very reasonable standard and are certainly well in advance of student work in Egypt and Pakistan.

5.1.22 The 1971 Munro report is well reasoned and makes a strong case for the training of Turkish industrial designers. The report is interesting in that it quotes the ICSID definition of Industrial Design and goes on to relate that definition to the needs of Turkish industry. It also states the need to review the course constantly in the light of the developing needs of the country. It is also interesting to note that he reasons that industrial design in Turkey can best be developed from existing architectural resources by pointing out that it was in this way that the profession was developed in more advanced countries. This is exactly in line with the arguments I developed over the situation in Pakistan and I welcome it as a valuable confirmation of my views.

5.1.23 In its attitude and values it is in my opinion absolutely right. It clearly took into account the situation pertaining in 1971, and whilst there are a number of points of detail with which I would personally disagree, I am sure that after a lapse of seven wasted years, so would the author! I have a copy of the report and append it as Paper No. 5; although some of the detail is immaterial as it would have to be revised to suit the current situation in any event.

5.1.24 METU belies its title 'Middle East' Technical University in that at present only Turkish students are

are enrolled, at least in the faculties I visited, although I was told that this was the case for the whole university. Even before the troubles of the past few years, any foreign students came mostly from the USA, attracted by an American type university, with mainly American qualified staff, offering tuition at ten US dollars per semester and accommodation at two US dollars per month! but political troubles have changed all that and driven the Americans home.

5.1.25 That places should be to Turkish nationals is understandable when apparently four hundred thousand high school graduates vie for sixty thousand University places each year. The name implying, I would have thought, a service to a wider community is perhaps somewhat inappropriate in the circumstances.

5.1.26 As might be expected from the 1959 foundation, the campus is well sited on rising ground outside Ankara itself and well laid out and landscaped. The buildings are modern, of good quality construction, and well maintained. The Architecture School is particularly spacious, being the first building to be constructed on the site: later buildings having more average allocation of space, but are still ample.

5.1.27 There is a central library building on several floors, spacious, with good study spaces adjacent to the book stocks. These have room for additional books, probably as many again. The library is properly organised and the books are kept in good order on the shelves. By the well-used look of many of the principle volumes, they must be well referred to by the students. Most of the architecture section seems to date from about 1959 and there was no evidence of recent acquisitions. As might be expected from the nature of the foundation, American titles predominate. For a serious study of design a similar provision would need to be made as in the case of the other countries visited on the mission.

5.1.28 The working conditions in the studios are good and judging by the standard of the second year architecture students, the discipline and intellectual level of the students is good. They gave every appearance of being so. Whilst no-one has any practical experience of industrial design, the climate of opinion seems suitable and it would seem to be a good place for a course, providing that the necessary resources could be made available, with practical design experience being the greatest need.

5.1.29 Such a course would not be likely to be readily attractive to existing students. Members of the architectural profession have an accepted place in the social order and in the job structure of the State. It takes a brave person to be a pioneer in a new and so far unrecognised profession. Some positive Government support will need to be forthcoming if sufficient progress is to be made in a reasonable period of time.

5.1.30 There followed visits to two furniture manufacturers, arranged at my request, in order to try to get nearer to consumer orientated design. The first factory, Kantur, produces designs of average modern type - straightforward, unexciting, but competently produced and of good quality. They are made on highly sophisticated automatic machinery for the most part, but drawer making was largely hand done using rather antiquated methods, but nevertheless competently done. Most of the design work is carried out by their own "design" staff who copy and 'adapt' foreign design concepts. The factory has been in operation for the last four years and has a sizable output.

5.1.31 The Orsan factory actually has its own designer who trained as an architect at the Facutlry of Fine Arts in Istanbul - Mr. Selen Zekai. The firm was founded four years ago and also has a spacious, well equipped factory with the latest wood working machinery and

produces a variety of furniture for bedroom, dining room and hotel use, with chairs, upholstery and so on. They also act as contractor doing complete interior design schemes and fitting-out work for shops and offices. These are designed by Mr. Zekai so they are offering a design service to customers. They export furniture to places such as Saudi Arabia.

5.1.32 Mr. Zekai is a competent designer with a definite style which is not wholly European. His hotel furniture is most attractive and serviceable. Although only four years old, they are already extending their factory space considerably and re-equipping. The new machinery ordered one year ago from Italy and Switzerland has arrived and will shortly be installed, and the current production capacity of fifteen bedroom sets per day will then be increased to seventy-five per day.

5.1.33 The general picture that emerges of Turkish industry is of many small, but by no means insignificant companies, well and dynamically run by businessmen who know what they are about, aware of market needs and conditions and expanding at an impressive rate. Their factories are new, clean, spacious and well equipped and the quality of their output is carefully controlled.

5.1.34 In his 1971 report, Munro said: "A careful analysis of Turkey's present (i.e. 1971) economic situation as well as her plans and targets for the future indicated an expanding industrial effort, and capacity that will require the service of industrial designers". He went on to say that 'realistically only properly trained industrial designers can help Turkey's manufacturing facilities realise this ambitious goal". After studying the situation for two years he called for "speedy action upon the implementation of a viable Department of Industrial Design" (at METU) no less than seven years ago.

5.1.35 The Dean of Architecture greeted my thoughts for special training courses with enthusiasm. He also believes that it is people not "hardware" that count. Properly trained staff will pursue their own interests and the rest will follow, whilst "hardware" purchased without the people ready and able to use it achieves nothing.

5.1.36 All of the factories visited were scattered about the countryside surrounding Ankara at distances of some miles. They are literally scattered like confetti, and in ribbon development form along the major roads. As these will undoubtedly develop rapidly, as already described, the problems that will arise in the future will be enormous, and I have been unable to detect any coherent planning principle which is being followed.

5.1.37 On Wednesday 29th March I met Mr. Tuzun, who is Under-Secretary at the Ministry of Industry. We discussed the need for industrial designers in Turkey and he is personally convinced that there is a need. A graduate engineer himself, he prefers action to words and I told him that he had a ready opportunity by supporting the endeavours of the Faculty of Architecture at METU in starting the proposed course on Industrial Design, and read him relevant passages of the Munro report. He promised his support and arranged a meeting with Macit Benice, Director of the Ministry's Science and Technology Department, Selen Orsan, Head of Department of International Relations at the Ministry of Industry and Technology, and Ahmet Gerreh, Director of In-plant Training for Engineers at the Ministry of Industry and Technology.

5.1.38 We had a long discussion on the subject of the education of designers, and again support was promised for the METU proposal. During these discussions it was said that Government support would be needed if the plan

was to succeed as industry would have to be prepared to use graduates when they became available. I told them that I had already made this point in my draft report and that one of my recommendations would be for the encouragement of Government support. Mr. Tuzun had earlier said that when in London he enjoyed visiting the Design Centre and seeing the goods displayed there and so I explained the type of support that some governments give to the matter. Whilst more junior officials always seem to be confused by small details, Mr. Tuzun seemed receptive and keen to pursue the matter. He should be gently encouraged to keep an eye on the developments in his country.

5.1.39 The remaining meetings of the day, firstly at Turk Traktor and later on at the Chamber of Industry, served to confirm the impression already gained at previous meetings. People are open and frank in discussion and will discuss their work and future plans in detail and without reserve. The Turkish graduate engineers are competent and capable of making worthwhile and constructive modifications to designs which in the medium and large organised sections of industry are almost inevitably being made under licence from American, or more usually European firms.

5.1.40 Sometimes in meeting Turkish manufacturing or user requirements the modifications amount to improvements which are accepted by the licensing company and included in their own main manufacturing programme. The engineers have a contribution to make and those that I met are making it intelligently. It remains to be seen if an industrial design capability of equal standard can be achieved.

5.1.41 Bottlenecks in production are often caused by the foreign currency problems already referred to. Last year's output of Turk Traktor was cut from 20,000 units to 10,000 through lack of imported components - although

only about 25% of the parts needed are imported. This means the importation of more completed tractor units either immediately or at a later stage as the Turkish industry does not at present have the capacity to meet demand. These are all very real problems which clearly obscures the need for training designers to cope with the different problems that will arise when the rapidly expanding industrial capability will be available and able to meet demands, and have surplus capacity for export.

5.1.42 If a start is made now, it will be at least six years before any graduate industrial designers will be available. It could be done through METU although its political troubles had not endeared it to any of the government officials that I met.

5.1.43 I was not able to see small scale industries which I believe also have a substantial output, but on a more craft orientated basis, and presumably their problems are similar to those encountered in small scale industries in other countries. As in Egypt however, no specific mention of their problems had been made in my presence.

ISTANBUL

5.2.1 On March 30th, in Istanbul, I met Prof. Lemi Ulugol, a graduate mechanical engineer, who is Vice-President (Industry) of KOC Holdings AS, and proved to be a most knowledgeable person on the subject of industrial design. He had invited A. Umur Camas, industrial designer and a graduate of the Istanbul State Academy of Fine Arts, to be present. He was fully aware of the subject and the need to improve the design of domestic products even though sales can be made without design improvement at present but he is thinking of the day when Turkey may become a member of the EEC and also when production passes home consumer needs. His organisation already exports some consumer products such as refrigerators to

Middle Eastern companies through their American liaison, but he sees the need to make their products to acceptable European standards.

5.2.2 We had a long and fruitful discussion and he made a number of appointments for me and confirmed others, and he arranged for me to meet his company's main competitors.

5.2.3 What proved most interesting was a visit to the Design and Research group of KOC where I met Prof. Dr. Kemal Atesman and the brothers Claude and Jean Nahum - all mechanical engineers but Jean Nathum has also taken a Masters degree of the Royal College of Art, London. The group was formed in 1973 to design a rotary petrol driven engine, and this took five designers sixteen months to accomplish. As to means of prototyping, they consulted Prof. Wankel himself who said their design would not work. They therefore went to Westlake in England for the prototype. Starting from basic principles, their technology was more advanced than the original design. Their work was computer aided and as they were not able to spend money on prolonged physical development programmes, they simulated running conditions with the computer, modifying the design according to its predictions. Many problems were foreseen in this way and steps taken to avoid them, with the result that the first prototype engine ran within twenty minutes of completion and with a better-than-predicted performance.

5.2.4 They published one paper and filed seven patents for this design. This was the first petrol engine designed in Turkey and altogether five prototypes were made. Unfortunately when General Motor in the U.S. decided to abandon their work on rotary engines, KOC decided to quit also on the assumption that G.M. must be right, not on a logical appraisal of the position.

5.2.5 The Design and Research Group now has a staff of seventeen people and serves the sixty to seventy KOC enterprises, many of whom are too small to have their own permanent research and development groups. During the engine project there were times that they found themselves without sufficient work and it was then that they decided to diversify their activities. One of the first projects was a child's bicycle and it was through this they learned that it was necessary to provide more than just industrial design skills. They needed to optimise production techniques by industrial engineering, handling of services, controls, cost reduction, plant layout, etc. etc. As the originating company had not carried out adequate or accurate market research, the target selling cost - which was met by the design - was in practice too high and so only five thousand were made altogether. However photographs of a two year old model showed it to be in a remarkably good condition, which says much for the design of this highly innovative plastic bicycle.

5.2.6 The marketing failure taught them another lesson for future project appraisal, and by recording and systemising the steps taken in this and other projects, they began to define the methods for dealing with future projects leading to economies in both time and money. As the first such research and development unit in the private sector, in the broad sense, they were met with some scepticism and the KOC directors insisted they they win the co-operation of the group's companies by their own unaided efforts.

5.2.7 From their experience they realised that short term successes were essential before long term industrial design projects could be obtained and successfully developed, as companies do not readily accept external advice. However once small successes are achieved then requests for advice and design assistance begin

to flow more readily. In the first instance the group had to beg for work and no costs were charged by the main holding company. However work is now properly charged for.

5.2.8 They tackled a commercial refrigerator project and designed a modular system to replace twenty models, with a wider choice of unit as a result. They are currently concerned with the design of an entirely Turkish built car.

5.2.9 This group is practising in exactly the way such a group should work and its educative effort is an example. It would be worthwhile considering asking them to prepare a paper for the UNIDO Indian Design Conference as a classic example of what properly trained, skilled industrial designers can do for the industry of a developing country. It would come better from them than from design experts from developed countries.

5.2.10 Their attitude to dealing only with those projects which will be of real value to the consumer, the company and their country is entirely praiseworthy. Theirs was by far the highest standard of design work I saw on the whole mission. Their work on the car is also an interesting example in that, apart from their logical and analytical approach to the problem, their own organisation has put them into direct competition with Western automative design of the highest calibre, Pinin Farina, Berthoni, Ogle, etc. Two cars have so far been chosen from the designs of all of these groups, theirs and that of Berthoni, for prototyping and practical comparison testing later in the year, and following this a final choice will be made.

5.2.11 All of their experience is recorded and programmed for future use and they have created a number of computer programmes to speed their work and avoid loss of knowledge through loss of skilled personnel.

5.2.12 The KOC group include Arcelik, the largest individual Turkish manufacturer of consumer durables; refrigerators, washing machines, air conditioning units, etc. They have three main plants and I visted one of these about 30 km. from Istanbul. The product design department is staffed by engineers and has one experienced industrial designer, a graduate of the Istanbul Academy of Fine Arts, which seems an appropriate balance for the type of work carried on. They organise their work under various headings - evaluation, testing, etc., but as they do not have sufficient staff to control these various activities separately, they have to be generalists in practice. This, in fact, is probably not a disadvantage. They design their own appliances and do not rely on licence agreements. Their method of designing is first to search the existing literature on the subject and then purchase and evaluate different foreign makes of the appliance, e.g. for an automatic washing machine they purchased Bosch, Miele and Italian makes for comparative analysis.

5.2.13 They say "mainly we copy" but in fact they apply a critical analysis to the function and construction of the machines, changing the programmes to meet Turkish needs, changing the control systems to allow for the widely fluctuating voltages of the Turkish electricity supply system - e.g. a 22% variation at peak periods of the stated 220 volts - and designing parts suited to the manufacting techniques available. By this means they often simplify and improve the design, obtaining better value from their detailed study and value analysis.

5.2.14 They also attempt to avoid the use of materials which have to be imported - ball and roller bearings, phosphor bronze, stainless steel, etc. As they are not bound by licence agreements, they have the freedom to develop

as they see fit without having to seek outside approval from foreign firms.

5.2.15 This was seen to be a brake on development at Turk Traktor where the parent company, Fiat, does not have time to consider all the minor modifications that the Turkish plant wishes to use.

5.2.16 Having examined their testing facilities in the laboratories and seen their prototype workshop as well as specific examples of their detailed design work, one can but congratulate them on the very high standard of methodical appraisal and intelligent development and their critical approach to cost and value analysis. Arcelik is of course a very sophisticated concern, with its own computer, and they are certainly aware of the way in which these facilities should be used. They do not give vacation jobs to industrial design students but they do to mechanical engineering students.

5.2.17 A visit to their main competitor Profilo, in Istanbul, revealed a design department consisting of four mechanical engineers and three industrial designers. Of the latter, two were trained at the Academy of Fine Arts to degree level and one at the Technical High School which is diploma level. This company manufactures under eleven different trade names, e.g. A.E.G., and engages in "face-lifts" of models which have been running for some time. As four trades names can require a new look all at the same time, this tends to cause "industrial design" to become "styling".

5.2.18 However they maintain that as different areas of Turkey are loyal to different brand names, and expect a different appearance, their approach is quite logical. They say that in Istanbul the financial status of many people leads them to a preference for the Bosch or American type of design, whereas in Central Turkey, for example,

it is necessary to add bright gold trim in order to sell, and in Western Turkey blue is the most popular colour.

5.2.19 This organisation offers vacation employment to students of industrial design and is able thereby to select prospective employees. Such jobs are usually for periods of three months or so but they also have visits from students at other times to discuss individual projects.

5.2.20 Whilst a number of people agree that a design capability is needed, nothing is being done to assist small industries as has already been stated. There is a UNIDO project for a small technical help centre at Gaziantep in South Eastern Turkey but this has still to be realised and it is doubtful if it will make a contribution to design.

5.2.21 Mr. Tolgar Cauusoglu of the Industrial Development Bank of Turkey, a private bank but responding to Government policy, said that whilst they could not help very big industries, their attention was directed to the needs of the medium to large organisations. They have, apparently, started to do something to help small scale industry, with the top limit for use of the adjective "small" being a fixed investment level of two to three million US dollars, excluding working capital. He confirmed that there is no specific encouragement for small industry, nothing for size, industrial sector, ownership, location, etc. In fact there would appear to be a bias against it, and there seems to be no way in which the banks could be used to encourage the use of design as could be the case in other countries.

5.2.22 The Director of the Istanbul Academy of Fine Arts, Prof. Sadun Ersin, is also head of the department of interior design and industrial design, at present a combined group which it is proposed to separate into two depart-

ments in the future. They are also hoping to establish an Industrial Design Research Institute.

5.2.23 They run five year courses, with a common foundation year, leading to the equivalent of an M.A. degree. The Uuksek or Technical High School has a four year diploma course in industrial design and comes under the direction of the Academy. The Academy covers the usual range of subjects; painting, sculpture, etc. and the industrial design course has a total of fifty-five students over the four years and a staff of four teachers and six assistants. The Diploma course has one hundred and fifty students.

5.2.24 The foundation year, which seems to be serving other projected academies of the future has a total of three hundred and fifty students with a total staff of ten, which would not be considered an acceptable ratio elsewhere, and furthermore the students are working in poor light and in extremely cramped conditions. This must have a very detrimental effect on the value of this important introductory phase of studies.

5.2.25 The general library has space for study purposes but the book stock is small, and as they admit is not well organised, as they cannot afford or obtain proper library staff. The industrial design studios are equipped with ordinary tables but are large enough for the number of students on course. However they only have a very small woodworking shop with a few basic tools - a plane, a band saw, etc., no more than four or five altogether and very little bench space. For metalwork they have only one small model-making lathe but no-one is capable of operating it.

5.2.26 The paper projects that the students produce are most creditable in the circumstances. The drawing ability displayed is good and there is evidence of plenty of

of imagination. The staff are mainly graduates of the Academy themselves with little or no practical experience. This supports the criticisms heard in industry of the students' lack of preparedness for the real world and their rather egocentric views of the value of their own creative abilities since they are clearly not prepared for seeing the things they have designed put to the critical test of actual realisation.

5.2.27 There was no mood of complacency however on the part of the staff I met and I believe them when they say that help would be welcomed. At the same time the Director says Turkey must stand on her own feet, which is also laudable. They are trying to be more practical and scientific and should be encouraged to this end. They come under the Ministry of Culture, which of course does not have the same attitude as the Ministry of Industry which conceivably might be more aware of the need for design training - at least the Under-Secretary seems to be so aware.

5.2.28 Help is needed for the publication of papers for which they have no funds at present, and also with information and literature to develop and teach the history of design as distinct from the history of art which is how they are presently equipped, much to their regret.

5.2.29 Mrs. Beril Anilanmert, an Associate Professor of Ceramics at the Academy is the General Secretary of the Turkish Design Association. This was started two years ago but has had to cope with various legal and other difficulties concerned with the formation of such a society in Turkey and is only now, since January 1978, becoming effective. They have been seeking advice on their proposed constitution but the ICSID office does not seem to have been of much assistance and I recommend that in future, applications from new member societies

be dealt with by more experienced members of the Board, or working groups, or the Senate. Certainly a much greater understanding of the problems encountered in developing countries needs to be displayed. The present address of the Association is: Eczacibasi Ilac Fabrikasi, Buyukdere Caddesi, Levent, Istanbul.

5.2.30 In Turkey the industrial units visited, both large and small, were very modern, well equipped and well directed. Graduate mechanical engineers play a major role in this and seem to have a sound grasp of a wider range of knowledge than one normally expects from such training. Standards generally are far nearer to European standards than any other country visited and so for that matter are the aspirations. An awareness of the need to maintain quality standards is also evident.

5.2.31 Paradoxically the problem of developing industrial design is probably greater here because of the more sophisticated stage of development. METU has plans for a design course which includes all the necessary technical and promotional skills and has the space, but not the course.

5.2.32 The Istanbul Academy has many years of experience and has produced many successful graduates but does not have the space or the diversity of skills that it should have.

5.3.33 Some industries are aware of the need for good design and operate at European levels; others are not aware that skills are available.

5.2.34 Ministries that are aware of the needs of industry are not the ministries that control the educational system. Wages in the State sector are low and do not attract the people who are necessary to develop the profession.

5.2.35 Unfortunately it was not possible to visit the remoter parts of the country and local journeys, of similar distances to those made in the other countries visited, did not show the disparities of city and rural life to the same extent as elsewhere, but this is probably because the hinterland of Ankara and Istanbul reaches further. My general impression was that after spending a week mostly in tracking down the sources of information, much more time is needed to make an accurate assessment of this most complex situation.

5.2.36 A visit to the old parts of Istanbul revealed the same type of street trading methods and the small single shop units as in the other Asian countries. More of these have closed or closable fronts due to the colder winters but the pattern is similar. Added to street scenes reminiscent of Karachi, are the small workshops, although not quite so much in evidence in Istanbul, which are clearly responsible for a very large proportion of the consumer goods made in Turkey. This is particularly true of the cheaper furniture where the system clearly follows the Indian and Pakistani way of making and selling on the spot. The largely tourist-orientated jewellers shops in the Grand Bazaar are grouped as in the similar situation in Cairo, and as in all the other countries the tools of the trade are available in the same area, together with the general supporting facilities for die-making, plating, etc. The goods for sale are of fairly exhuberant design, as one might expect, and of the sort of quality one can expect from small, craft-based industrial workshops. Compared with the sort of salaries I was told people get, the prices seem somewhat high, but then it is always difficult to evaluate such things in the centre of a country's major cities.

5.2.37 Clearly more people have access to European goods and

European standards than in any of the other countries visited. Alongside precision-made hand tools, primitive home-made hand tools are sold, and the gap between these extremes therefore seems greater by contrast.

5.2.38 To make progress it would seem that the larger and more progressive industries who are quite capable of making their own way could be helped by better-trained industrial designers. That is by graduates who do not have a limited view of the extent of their job or duty to society or retain the "ivory-tower" syndrome that the Fine Arts Academy is accused of inculcating.

5.2.39 Nobody seems to care about the small industries, despite their large contribution to the economy. Government needs to be persuaded of their responsibilities in this matter if the development rate of their country is to be properly balanced and better opportunities both in employment and standards of living are to obtain.

5.2.40 Design education is needed for industry, large and small, sophisticated and unsophisticated. Design education is needed for consumers of all kinds, perhaps with the aid of a Design Centre, the value of which is appreciated at the Ministry of Industry and at the Academy. Improved facilities and a wider range of subject matter is required at the Academy and the establishment, without further delay, of the proposed design course at METU which already has a range of knowledge and some, at least, of the facilities.

5.2.41 In Turkey there was a greater language difficulty than in the other countries visited. Turkish usage of English meant a rather intense form of questioning was needed in order to establish facts clearly. For example, the statement in the present tense starting "We

have....." or "There is....." inevitably meant the future conditional: "We will, at some time in the future when various difficulties have been overcome and we have the money, etc., have...." or "There will..... etc. "

5.2.42 Note: Although more substantial than the home-made private houses seen in other countries, the Gecekondu, i.e. "built during one night", is very interesting. People dig out a terrace, or build one on a hillside, and then erect a simple rectangular concrete block building with a low pitched clay tiled roof. No water or electricity is available but after a number of years a group becomes a community and then agitates for the provision of the supply of services such as water, electricity, etc. and demands schools.

5.2.43 This points to an uncontrollable development pattern, as once a Gecekondu is established, it is an illegal act to evict the occupant. This taken with the lack of any readily discernible plan for factory development makes one wonder if the Turkish government can be aware of the future problems it is allowing to develop.

5.2.44 As the Munro report of June 1971 makes out a good case for the academic and physical requirements of an industrial design course and is widely applicable beyond Turkey, it is included here as Paper no. 5, as referred to in the body of the report.

PAPER No. 5:

AN OUTLINE FOR THE FORMATION OF A DEPARTMENT OF INDUSTRIAL DESIGN

a report by David K. Munro : June 1971

PREFACE

This outline supersedes previous ones in that it attempts, at this particular time, to more realistically appraise the current situation in Turkey and at the University - as well as in the Faculty of Architecture.

INTRODUCTION

A careful analysis of Turkey's present economic situation as well as her plans and targets for the future indicated an expanding industrial effort, and capacity, that will require the service of industrial designers.

Turkey, in an effort to bring about an improved balance of payments situation, will be compelled to increase her exports, particularly in consumer goods geared for the export market in terms of quality, price, function, and appearance. Realistically, only properly trained industrial designers can help Turkey's manufacturing facilities realise this ambitious goal.

Furthermore, and equally important, there is a growing need in Turkey for improved products, and new products of all description, to be sold on the domestic market - and also to be produced as substitutes for imports. Again in these instances the services of competent industrial designers are essential.

The definition that follows will serve to clarify the essential role of the industrial designer in any productive society.

A Definition of Industrial Design

The International Council of Societies of Industrial Design (ICSID) agreed to the following working description of the function of the industrial designer in Stockholm in 1959:

> An industrial designer is one who is qualified by training, technical knowledge, experience and visual sensibility to determine the materials, construction, mechanism, shape, colour, surface finishes and decoration of objects which are produced in quantity by industrial processes. The industrial designer may, at different times, be concerned with all or only some of these aspects of an industrially produced object.
>
> The industrial designer may also be concerned with the problems of packaging, advertising, exhibiting, and marketing when the resolution of such problems requires visual appreciation in addition to technical knowledge and experience.
>
> The designer for craft-based industries or trades where hand processes are used for production is deemed to be an industrial designer when the work produced to his drawings or models is of a commercial nature, is made in batches, or otherwise in quantity, and is not the personal work of the artist-craftsman.

A new draft by ICSID on the definition of the industrial designer also includes this quotation:

> The depth of the designer's responsibility may

range from the original conception of the product's mode of use to its visual and tactile finishes, and involves the correlation of its functional, cultural, social and economic contributions to the betterment of the human environment.

Industrial Designer and Architecture

The place of industrial design as a discipline within the Faculty of Architecture should be explained.

There is a very direct relationship between architecture and industrial design. Historically, almost every country in the world with a developing economy has started industrial design courses in their leading schools of architecture.

The architecturally orientated student, in his pursuit of form, scale, construction, materials and social sciences is in an excellent position to turn his attention to industrial design. If we can combine the technical skills of the architect with his ability to communicate graphically and three-dimensionally, then we might have an ideal industrial design candidate.

It is also possible to start industrial design programmes in schools of engineering but the problem that often arises is that designers are turned out too heavily orientated in engineering without sufficient graphic skills and often with limited social aptitudes.

The architect concerns himself with shaping his environment; his major concerned is people-orientated. The industrial designer also concerns himself primarily with people's needs: how can people be made more comfortable, happier, with safer, more practical, more efficient products at more reasonable prices?

The major difference then in what the architect and the industrial designer finally produce is mainly one of scale, not attitude. But in both instances the objective is, or should be, to bring people a richer, more rewarding life.

It can be seen why virtually all the industrial designers from the 1930's through the 1950's were originally trained as architects. Many in business today practice both as licensed architects and industrial designers.

THE DEPARTMENT OF INDUSTRIAL DESIGN

It is proposed here that the Department of Industrial Design (DID) be established as a graduate programme for four semesters resulting in a Bachelor of Industrial Design degree. Initially all students should be Turkish nationals and preferably males.

A time schedule follows:

Year	(1) Visiting	(2) FOA	(3) DID	(4) Students	(5) Training
1971-72	1	1	0	30	1
1972-73	1	0	2	35	2
1973-74	1	0	2	40	2
1974-75	0	0	3	45	1
1975-76	0	0	3	45	1

Explanations:
(1) Visiting foreign professors
(2) Faculty of Architecture personnel
(3) Department of Industrial Design personnel
(4) Students enrolled in the DID, including electives
(5) Students, and staff, in advanced training abroad.

Curriculum Outline

The following four semester outline is based on this writer's evaluation of what is most urgently needed by architectural students who wish to become practising industrial designers.

1st Semester
History of Industrial Design
Industrial Design
Industrial Liaison
Introduction to Economics
Engineering Graphics

Elective

2nd Semester
Modelmaking
Industrial Design
Industry Liaison
Marketing
Fundamentals of Manufacturing

Elective

3rd Semester
Packaging/Graphics
Industrial Design
Industry Liaison
Social Change and Development
Machine Tool Fundamentals

Elective

4th Semester
Packaging/Graphics
Industrial Design
Industry Liaison
Photography
Marketing and Sales Management

Elective

Description of Courses

History of Industrial Design

An introduction to the history, philosophy and social meaning of industrial design. Topics considered would include the Renaissance, the Industrial Revolution, the Bauhaus, Embryonic ID: personalities such as Da Vinci, Gropius, Loewy, Dreyfus; industrial design today in various parts of the world; the economics of industrial design, the industrial designer and the architect, city planners.

Introduction to Economics

Natures, scope and method of economics; basic economics problems of societies; principle of supply and demand in a competitive market; cost and output of a firm; determination of prices and output in competitive and monopolistic markets, short-run and long-run equilibrium. Theory of imperfect competition. Distribution theory: rents, wages, interest and profits.

Industrial Design

The student, in order to be exposed to as many experiences as possible, will be presented with various product design problems which will increase in complexity as he progresses. He will be urged to think analytically, creatively, and in terms of consumer needs and manufacturing economics.

The problems, pertaining to Turkey's requirements, existing products, manufacturing capabilities, and marketing limitations, will explore a variety of basic materials and production techniques (i.e. in metal, wood, plastic, glass, paper).

Consideration will be given to the entire development cycle, from product creation to consumer application, with attention to factors such as: pricing, consumer

attitudes, packaging, servicing, durability, quality control, function, display, promotion, materials specifications, human engineering, competitive products, colour and aesthetics, and so forth.

Problems will include solutions to products designed for the home (housewares, appliances, furniture and furnishings), transportation (bicyles, motor-cycles, automobiles), and commercial products such as outdoor lighting, machine tools, telephones, hardware, and electrical products.

The student will present his ideas in sketches and drawings, mock-ups and models, and through basic engineering drawings.

Engineering Graphics

Selection and use of drawing instruments and pencils. Standard lines, engineering lettering and figures. Essential geometrical constructions, Tangency, orthographic projection, Sectioning, screw threads and fasteners. Visibility, Primary and secondary auxiliary views. Isometric and oblique projections.

Industry Liaison

The student must be exposed to reality at the critical point, which is that of manufacturing. Through field trips to selected industries he will gain first hand experience of both production capabilities and problems in diverse basic as well as specialized industries.

Modelmaking

In order for the student to translate his ideas into concrete three-dimensional forms, he will have to produce his own full or reduced scale models. The students would be taught to work in clay and plaster (for 'Breadboard' and site models), plastics, wood, metal, and

other pertinent materials. Simultaneously he would be introduced to machine shop operations and principles, both to familiarise him with some of the basic tools of industry as well as to teach him how to use the machines to produce his own models.

Marketing

A study of the general problems of the marketing manager relating to the consumer, product, price and promotion. The approach is functional, institutional, and interdisciplinary.

Fundamentals of Manufacturing

Casting processes, Hot and cold forming of metals. Press work. Types of dies. Welding. Measuring and gauging. Metal removing, Cutting forces. Turning, milling, shaping, grinding, lapping, honing operations. Fundamentals of production.

Packaging/Graphics

The student will be exposed to packaging and graphics principles, methods of production. Elements of the course would include typography, corporate indentification, trade marks, lettering, printing processes, packaging machinery, layouts and mechanicals, container and closure designs, legal requirements, colour psychology, point-of-sale considerations and materials.

Social Change and Development

Process in social change in the modern world; industrialisation and its consequences. Demographic, institutional and cultural aspects of development.

Photography

This course would be technically orientated towards the following: processing, developing, enlarging, duplicating, optics, product photography and cataloguing.

Marketing and Sales Management

A detailed study, using case histories of management problems relating to both the product or service and the organisation of the marketing department. Product: new products, branding, packaging, promotion, distribution. Organisation: recruiting, training, and supervision of sales personnel.

Elective Courses

There follows a list of elective courses selected from the METU General Catalogue. These are considered suitable for all students seriously interested in a career in industrial design. Those starred represent the most important electives. It will be noted that many of them are already incorporated in the industrial design programme outlined in the previous section.

Introduction to Economics
Principles of Economics
Marketing
Marketing and Sales Management
Social Change and Development
Engineering Graphics
Machine Tool Fundamentals
Economic Theory I
Structure of the Turkish Economy
Industrial Organisation
Marketing Research
Industrial Marketing
Principles of Sociology
Industrial Sociology

PHYSICAL REQUIREMENTS

For our needs we can assume a maximum of about sixty students in the Department of Industrial Research (DID) as well as support staff. We can envisage a physical plant that could be in a separate building (or as part of the existing Faculty of Architecture).

For the sake of clarifying the full needs of the DID, an optimum arrangement has been indicated in what follows:

1.

Identification of Areas	Functions	Space
A. Workshops	Metal, wood, crafts, photography	1200
B. Studios	Classrooms, workrooms	580
C. Conference	Conference, lecture, presenta	60
D. Library	Periodicals, research, texts	50
E. Exhibit	Student, special, travelling	40
F. Offices	Teacher, secretarial, shops	230
G. Toilets	Men/women	15
H. Maintenance /	Storage / Supply	50
		2225 sq.m.

A further breakdown of the eight areas mentioned above follows:

Area A - Workshops

Metal shop - 15 x 20 m. Woodworking shop - 15 x 20 m.
Crafts shop (ceramics, plaster, jewelry) - 15 x 20 m.
Photography (studio, darkroom) - 300 sq.m.

Area B - Studios

Sixty students - 480 sq.m. : Two classrooms - 100 sq.m.

Areas C, D and E - Conference, library and exhibit respectively are self-explanatory.

Area F - Offices

Eight teacher offices at 20 sq.m. each - 160 sq.m.
Two secretarial offices at 20 sq.m. each - 40 sq.m.
Model shop office space - 30 sq.m.

Area G - Toilets

Self-explanatory.

Area H - Maintenance/Storage/ Supply

Storage and supply areas for workshops - 40 sq.m.
Miscellaneous maintenance, janitor area - 10 sq.m.

For expansion, corridors, possible addition of another classroom or a supply store, add 200 sq.m.

· Total physical space required : 2425 sq.m.

2. WORKSHOPS

There are four basic types of workshops: metal, wood, crafts and photography. In each, basic machinery, handtools, and raw materials will be required in multiples of three to eight (three for machinery, up to eight for hand tools).

3. STUDIOS

Specifications are to be considered for drawing boards, blackboards, illumination, seating, and other support requirements.

4. CONFERENCE

Specifications are to be considered for seating, tables, illumination, blackboards, and a full audio-visual system permitting the widest range of presentations (film, slides, special effects).

5. LIBRARY

Specifications are to be considered for tables, chairs, illumination, racks, storage and display areas, files and indexes, and a special section on materials files. Periodicals, books and research materials lists are currently being compiled.

6. EXHIBITS

Specifications will have to be considered for a multi-use modular system for two and three dimensional exhibit requirements, along with appropriate props and additional display lighting.

7. OFFICES

Eleven offices are contemplated. Specifications will have to cover needs for desks, chairs, tables, drawing boards, illumination, secretarial and duplicating apparatus, bookcases, files, and other support requirements.

8. TOILETS

Specifications will have to be drawn up for men and women's toilets with extra large clean-up areas being required adjacent to the workshop areas. A first-aid corner should also be included.

9. MAINTENANCE STORAGE SUPPLY

Specifications will have to be drawn up for all maintenance requirements, raw materials for the shops, and expendable and durably supplies such as papers, art materials, drawing equipment, and so forth.

FURTHER ASSISTANCE / FINANCIAL SUPPORT

A constant effort must be made to secure additional assistance and financial support on behalf of deserving students as well as the department itself. For instance leading Turkish industries are being contacted to provide specific projects to the department and are also being encouraged to provide financial assistance for student scholarships or travel funds.

Private organisations such as the Ford Foundation and the Fulbright Commission have been contacted in the hope of securing student fellowships as well as additional

visiting professors in industrial design and related subjects.

Organisations such as UNESCO and OECD have also been contacted with the same purposes in mind.

The Agency for International Development (AID) is continuing its support in terms of providing a visiting professor in industrial design and allocating student fellowships for further studies in the USA.

A DESCRIPTION AND RATIONALE OF INDUSTRIAL DESIGN

It is particularly important that at the outset of the planning for a Department of Industrial Design (DID) within METU's Faculty of Architecture, the definition, function, and significance of industrial design within Turkey's economy be clearly stated and understood. Industrial design, beyond the definition quoted on page two of this Paper, is essentially an art-science effort to bring better order, function, well-being, comfort, pleasure, and aesthetics to the consumer. The industrial designer, to be effective in such efforts, must be trained in various disciplines which include art, engineering, social sciences, business and marketing.

'Mass production' is the key to the definition of industrial design, and that in itself allows for a great deal of flexibility. Industrial designers address themselves to the designing of railroad cars, produced in minute quantities, and also to toys or plastic housewares produced in quantities of millions of pieces. The moment goods are produced with any sort of planned repetition (i.e. 'mass production'), the producer and the designer is obliged to consider factors normally unfamiliar to the craftsman-producer who makes, usually, one-of-a-kind objects or basically similar objects all totally produced in sequence without mass purchasing of raw materials, without high capital investment, and

and without complex tools, or distribution of labour. Nor are they concerned with elaborate marketing considerations.

A distinction must be made between craftsmen, handicrafts, and industrial design. Although the design profession employs craftsmen in modelmaking, tool and die work, etc. the craftsmen is seldom an industrial designer - and vice versa. Handicrafts (craft products is a more apt term) are the products of cottage industries, individuals, and co-operatives, whose markets are usually tourist, domestic necessities (i.e. baskets, rugs, clay containers, textiles,etc.) and export commodities to the huge craft markets in Europe and the USA. The industrial designer does not normally become involved with handicrafts producers unless they require design, marketing, and production assistance in an effort to expand their sales and become, in actuality, light industry producers.

Contemporary industrial design has followed the path of advanced technology and has, as a result, become involved in space programmes, undersea projects, and a host of specialised fields such as geriatrics, human factors, engineering, biomechanics, product planning, corporate identification, and all sorts of marketing and problem-solving activities - not considered within the realm of the industrial design profession just a few years ago.

Perhaps more significantly (as expressed by the last part of the official definition of industrial design by ICSID), the industrial designer has become increasingly involved in environmental design which often vies sharply with the work done by city planners and architects as well as with socio-economic design, on a global basis, to help developing groups and nations help themselves by producing desirable goods for existing or created markets.

It can be seen why the term 'industrial design' can seem a little redundant when the profession easily encompasses some twenty-five specialities (i.e. equipment design, graphics, exhibits, home appliances, transportation design).

Thus we can say that industrial design, at its best, is an important social factor. It is, moreover, a critical capitalistic tool. It does <u>not</u> really exist for aesthetic or altruistic reasons per se. When lagging industries approached Raymond Loewy, Norman Bel Geddes and Henry Dreyfus in the USA in the late '20's it was because these industries felt that they needed some sort of a competitive edge at the market place - the point of sale.

Industrial design, as an economic and social force, must fit and be geared to the economy in which it performs. The mere transposition of industrial design disciplines and attitudes from more advanced economies and technocracies, to Turkey for instance, would be invalid.

The latter is particularly true in the educational sector where essentially there are no checks and balances. It will be imperative for METU, in its proposed industrial design curriculum, constantly to consider the specific needs of Turkey's expanding industry as well as her consumer requirements.

In the writer's opinion there is no question whatsoever that Turkey, from this moment on, must train home-educated industrial designers to perform the vital functions that we have discussed heretofore - there is no substitute in any expanding economy for the properly trained industrial designer. In terms of Turkey's future, especially as the world shrinks, an awareness of this is essential ... and speedy action upon the implementation of a viable Department of Industrial Design at the Faculty of Architecture, Middle East Technical University, is categorically essential.

PROPOSALS

6.0.1 It can be seen that a number of points occur again and again through this report. The dominant factor in all countries is the "need to teach the teachers" and also further train the designers.

6.0.2 This section therefore consists of seven parts:-

1. Education and Training
2. Libraries and Reference Materials
3. Co-ordinating Designers
4. Publications Unit
5. General Proposals
6. Interdesign Proposals
7. Specific Proposals

1. EDUCATION AND TRAINING

6.1.1 Let me make it quite clear at the start that "education" in this context is as much industrial as cultural, and that "training" is in part cultural. Therefore my remarks on possible developments are part of the industrial development process in the countries concerned. Administrative problems will therefore arise but these must be solved.

Designers and/or teachers can be:

(A) trained indivudually; or
(B) trained in groups, on individually tailored programmes or on specially designed courses.

(A) Individual Training

6.1.2 This can be by means of a designers placement scheme of the type envisaged by Mary Mullin in her report on industrial design in South America.

6.1.3 There are some provisos that I wish to add to this proposal. In my country when a person wishes to study for a further and higher degree, he or she must register with the appropriate degree awarding authority. This authority demands that the person's work is supervised and checked by assessors, so that not only the final result but also the progress of the work is monitored.

When "placing" a designer in another country, therefore, it is essential that a supervisor and two assessors be apointed to whom the designer is accountable, and that these people are thoroughly conversant with the particular problems of developing countries. It will be their responsibility to ensure that the designer is able to make the best use of the time available and that the work undertaken is of a suitable type and standard for

the purpose of fitting the designer for the tasks that he will have to perform in his native country.

6.1.4 Such people can also ensure that when a designer is placed in a 'job' that academic support is available as required; and that when a designer is studying in an academic institution the needs of the real world are not overlooked.

6.1.5 Part of this proposal therefore is for the establishment of a working party to prepare terms of reference and briefing procedures for supervisors and assessors, and methods for evaluating and approving the appointment of such people.

6.1.6 These remarks apply equally to the placement of designers and design-teachers.

(B) Collective Training Courses

6.1.7 Designers who work, or who wish to work, in the developing countries, fall into two main catagories:

(i) designers who live and were trained in developed countries, who seek a worthy cause overseas; and

(ii) designers from under-developed countries who may have received their initial training in that country, or were partly or wholly given their specialist education in a developed country. Such students are often sponsored by their own governments.

6.1.8 Type (i) designers seeking to help developing countries seldom have specialist knowledge of the problems they are likely to encounter and have been educated by means of conventional courses. It would seem, therefore, that the development of short courses which would augment

the knowledge of such people by an intensive study of appropriate subjects would be a worthwhile contribution and one which could have far-reaching effects. Such courses would be suitable for from ten to fifteen students at a time.

6.1.9 Type (ii) designers will be more aware of their native countries' problems but will have had home-based or foreign education which will need to be adjusted and developed to give them the generalist background that they will need. Other than design disciplines will have to be added - to give them the necessary breadth of knowledge required. Most, if not all, of the existing design courses throughout the world are too specialised and do not create the wide-roving kind of mentality which is needed.

6.1.10 UNIDO - United Nations Industrial Development Organisation - is charged with the task of assisting Third World countries, and in matters concerning design it looks to ICSID - International Council of Societies of Industrial Design - the relevant non-governmental consultative organisation. Therefore courses could be validated by ICSID and approved by UNIDO; following which students could be sponsored by UNIDO and funded by them and/or by their respective governments. This is a complicated matter, but I am sure that UNIDO is capable of solving this problem.

6.1.11 There would need to be a number of courses for designers falling into several categories, and also for management. The duration and content of these courses would naturally vary and some further research in the field is necessary to establish sufficient criteria for a start.

6.1.12 The collation of information concerning staff who may be qualified to contribute to such courses is required and

I would emphasise the multi-disciplinary nature of the talent required.

6.1.13 Because of the experience level of appropriate students, much of the work of the courses could be conducted on "Interdesign" lines, the internationally recognised and approved method of design problem solving by mature students and designers, working together and using the chemistry of multi-disciplinary and multi-cultural backgrounds which has so far proved to be so successful. (Note: there is an existing ICSID publication explaining this type of activity in sufficient detail and copies are readily available to those who are interested).

6.1.14 Course programmes should provide a "two-way" stimulus, and hopefully generate and stimulate a greater sense of direction in many designers who, not surprisingly perhaps, are confused in the present situation.

6.1.15 Types of student for the courses envisaged would include the following:

a) Graduates in design subjects of developed countries who would wish to work overseas in developing countries.

b) Graduates of developing countries who wish to study at MA or second degree levels before returning to their country of origin to work on government or other sponsored projects. This group would contain students who have been initially trained in their own or a foreign country.

c) Mid-career experienced designers who wish to work overseas but whose experience and training is limited to developed countries, e.g. EEC or North America.

d) Mid-career designers and teachers who are sent from developing countries to increase their

ability to develop industry and similar tasks for which no specific training exists at present.

e) Graduates in business and management studies seeking careers abroad similar to a) but not as designers themselves.

f) Graduates in business studies and management but possibly other disciplines similar to b).

g) Management personnel wishing to go abroad and develop industries and business and similar to c).

h) Management personnel similar to d).

6.1.16 This list is not meant to be exhaustive and there are obviously many supportive activities for which the need is clearly evident; the common denominator being <u>design as a problem-solving activity.</u>

6.1.17 These courses taken together with a programme of research and consultancy which I also believe should be established, could lead to the establishment of internationally recognised UNIDO/ICSID centres of design training and education. It is certain that job opportunities for graduates would be greatly increased, as there is a great need for <u>suitably</u> qualified people throughout the world.

6.1.18 By making use of institutions already in existance, I envisage that there would be two or three centres for such courses to start with. A base in a developing country is needed as designers must do part of their training in a suitable environment and experience problems at first hand.

6.1.19 It is also essential to have a base in a developed country where students can be exposed to a suitable intellectual environment and where there is a sufficient breadth of skills and knowledge available to them.

6.1.20 Note the use of the word 'skills' - it is not my intention that students should be exposed to, or encouraged to rely upon sophisticated hardware. However as they will have to be able to set up project workshops, engage in marketing studies and promotional activities and so on when they return to their own countries, they will have to have the use of facilities which are only available in the right amounts and at the right intellectual level in developed countries at present.

6.1.21 My proposal therefore is for a pilot scheme between the National Institute of Design, India, and London, where a number of institutions could be involved to provide a multi-disciplinary and multi-cultural base. Courses could be organised on a mutually supportive basis and a valuable two-way flow of information and feed-back could be arranged. From the experience gained the system could be expanded and other centres added to the programme, e.g. one in South America and largely Spanish speaking.

6.1.22 We are concerned with industrial development, not intermediate technology. Our problem is not to find ways of recycling used Coca-Cola tines to make ingenious hydraulic pumps for village irrigation schemes, but to provide the design expertise that will assist in the development of indigenous industries and skills.

6.1.23 For example, a fashion/textile graduate trained in the way described could, in a six months overseas contract, enable an existing leather craft industry to create saleable shoes or accessories for export, and would be assisting in the creation of job opportunities in the country concerned as well as enhancing the foreign currency earnings which would allow the purchase of the right sort of pumping equipment from countries with advanced technology. The job creating process is a

two-way operation.

6.1.24 It is very fashionable these days to be well-disposed towards the problems of the Third World. Indeed, many conferences and seminars are held to discuss the problems; a comparatively recent example being the "Design for Need" exhibition and conference held at the Royal College of Art in London. However, in spite of the fact that much is said, there appears to be little in the way of tangible results.

6.1.25 One successful case history is worth a hundred seminars.

6.1.26 One adequately trained competent designer can make a greater impact on the industrial development of his country than a thousand seminars and exhibitions.

2. LIBRARIES AND REFERENCE MATERIALS

6.2.1 A common and major deficiency which is a bar to progress at all levels is the inadequate provision for reference materials of all kinds in all of the countries visited.

6.2.2 Designers cannot work in a vacuum. All design work needs information. Not glossy magazines to act as fashion guides but basic information on the physical properties and uses of materials, ergonomics, anthropology, design history and philosophy, manufacturing techniques, business managements, law, and so on, as well as American, British and German Standards (ASA, BSI and DIN) for example, and they also need samples of materials and finishes, etc.

6.2.3 <u>They need proper libraries and samples collections.</u> I did not find a single example of an adequate facility in any of the countries visited, nor anyone with the knowledge to set about the task of creating it.

6.2.4 The following steps should be undertaken immediately:

a) The preparation of an information leaflet as to how to establish and run a design reference library, how to classify and group material, how to issue it, etc.

b) A short design-librarianship course for suitable candidates from each of the developing countries visited.

c) The preparation of a book list and materials information list.

d) The purchase of books and materials to create basic unit libraries (400 to 500 volumes each) to be issued under UN auspices to the institutions in need.

e) The compilation and publication of regular book lists and information and advice, to be circulated to the new libraries.

f) The compilation of national directories of design orientated organisations, government departments, etc. to be undertaken by the new libraries or existing institutions as appropriate.

3. "CO-ORDINATING DESIGNERS"

6.3.1 From the generally adverse comments on "experts" appointed under various UN programmes - I have yet to hear a favourable comment - a new approach is clearly needed.

6.3.2 Experience on this mission, and from the correspondence that has followed it from a number of institutions and organisations, from <u>all</u> of the countries visited, leads me to the conclusion that the physical presence of "co-ordinating designers" visiting these countries would be the greatest aid to progress that could be envisaged.

(Note: everybody who promised to send informaiton at a later date has without exception fulfilled their promise).

6.3.3 There is no lack of talent or willingness to develop and to accept new ideas, but there is a great lack of confidence and experience. This is where the right person given the right task could help.

6.3.4 The problems surrounding conventionally appointed experts have been stated as follows:-

a) The expert needs time to settle down, find a place to live and adjust to local living conditions. This can take a considerable time.

b) When departing, the expert loses time again in writing final reports (considered part of his daily work), farewells and packing. This may represent a considerable loss of time. Note: In a year's contract, an expert's loss of time with item a) and b) may vary from one month to three months.

c) Some experts may be aloof and find difficulty in establishing a working dialogue with their partners.

d) In some cases, experts may try to hang on to their jobs by making themselves indispensible so that their contracts are extended.

e) Special work peculiarities of the expert may be reflected on the counterparts. Slow work and extended scheduling of work is an example of this. It is remarkable how counterparts pick up the bad personal and work habits of an expert.

f) Experts may be 'stingy' with their knowledge, transferring it slowly to the local counterparts and not revealing sources of material and information.

g) If local management does not provide good counterparts and insists on them learning and absorbing, and if management is not demanding on the experts to exert more effort and meet objectives, then transfer of knowledge and technology will be greatly jeopardised.

6.3.5 The continual presence of an 'expert' working on a specific and comparatively narrow programme lessens the effect of his or her presence, and in any event a wider spread of knowledge is needed.

6.3.6 The regular but shorter appearances of a high-level and authoritative designer, who can communicate at government level, is a totally different affair.

6.3.7 With responsibility for a wide range of activities, the selection of individually inappropriate or otherwise unsuitable projects would not be so wasteful.

6.3.8 Although higher travelling costs would be involved, the wastage of time referred to above would be eliminated as only a day or so for recovery from jet-lag would be required, and accommodation would not present the same problems as for semi-permanent residence.

6.3.9 The likely effect of the change of task and emphasis would therefore be a far greater rate of progress at a correspondingly more economical cost.

6.3.10 Criteria for the selection of suitably qualified "co-ordinating designers" would need to be established by ICSID and UNIDO. Briefing and/or pre-mission training would also need to be carefully considered.

4. PUBLICATIONS UNIT

6.4.1 In all of the countries visited, valuable design and research projects are carried out and useful papers and theses, many of a very high quality, lie gathering dust on the shelves of the various institutions, for want of funds for publication.

6.4.2 Much of this information is needed, not only in its country of origin but in other developing countries as well, where it might also prevent unnecessary duplication of effort and help to make a more generally economical deployment of scarce resources.

6.4.3 At this stage of development a multiplicity of publishing ventures would be counter-productive, but one or possibly two main publishing units should be established to perform this task.

6.4.4 Virtually all of the papers I saw were written in English so a single unit could service India, Pakistan, Egypt and Turkey. A panel of referees would have to be appointed to evaluate the quality of the papers submitted and see that the proper editorial functions were carried out and authors advised of any desirable amendments or additions.

6.4.5 It would be possible to establish a "no-profit, no-loss" enterprise as the publications could be sold probably at cost price. However funds would be necessary to establish the unit and carry it over the initial development stages. Once a reputation for a high standard of work was achieved the publications should become economically viable.

6.4.6 The preparation and distribution of visual aids to explain and encourage the development of good design and design practice could also be managed through such

a unit which could use existing organisations who are capable of doing the work but for lack of the necessary funds are not able to do so themselves.

6.4.7 We cannot afford to allow the time and effort that has gone into the preparation of valuable papers to be wasted. They must be published.

5. GENERAL PROPOSALS

6.5.1 New Societies

ICSID should consider alterations to the membership requirements for new societies to assist the new professional societies at the time of their greatest need - their formative years - when membership of ICSID is paradoxically not available to them, with particular reference to:

Society of Industrial Designers of India,
Industrial Design Centre,
Indian Institute of Technology,
Powai, Bombay 400 076.

Society of Designers of Pakistan,
E.6, 4th Gizri Street Defence Society,
Karachi 9.

Turkish Society of Designers,
Eczacibasi Ilac Fabrikasi, Buyukdere Saddesi,
Levent, Istanbul.

Egypt - awaiting formation.

6.5.2 Directory of Design Organisations

Encourage the production of directories of design and design-orientated organisations, governmental and

statutory bodies, etc. in each developing country.

6.5.3 Intermediate Technology

Develop an ICSID/UNIDO initiative for the collection and exchange of information throughout the world on the subject of intermediate technology, using abstracts and digests, in order to minimise the waste of resources due to the unwitting duplication of effort.

6.5.4 Collection of Artefacts

Encourage the study of design history and the establishment of permanent collections of everyday ethnic objects as prime study sources of design development.

6.5.5 Development of Education and Training Facilities

Improve the standard and quantity of equipment in the educational and training institutions by encouraging governments to provide adequate funding and by persuading manufacturing associations, etc. to provide equipment, e.g. machine tools and materials.

6.5.6 This is a task where a UNIDO "co-ordinating designer" could prove invaluable and demonstrate the long-term economical benefits to industry by the provision of equipment for training purposes. The monetary value of the equipment is minimal in comparison with the size of the larger manufacturing associations.

6.5.7 Packaging Equipment

Encourage the development of intermediate technology packaging equipment suited to use in developing countries. This is a vital need for the development of marketing and hence for design development and progress.

6. INTERDESIGN PROPOSALS

6.6.1 Standards of Quality

ICSID/UNIDO in collaboration with the Association of Indian Engineering Industries and the Indian Machine Tools Manufacturing Association, to consider and propose ways and means of establishing and maintaining standards of design and production using a workforce with extremely poor standards of living and general environmental conditions.

6.6.2 Safety Standards in Packaging

ICSID/UNIDO and ICOGRADA in collaboration with Indian Institute of Packaging and Export Promotion Councils to investigate the problems of safety in packaging.

6.6.3 Elementary Transportation

To re-appraise the need for, and design of, traditional forms of small scale transport vehicles, e.g. the bullock cart, as a principal means of goods transportation in rural areas.

7. SPECIFIC PROPOSALS

INDIA AND PAKISTAN

6.7.1 Small Scale Industries

The planning and development of common facilities centres and the establishment of "design clinics" for groups of small scale industrial units, using indigenous designers aided by visiting "co-ordinating designers".

6.7.2 The small scale industrial groups to be carefully selected in the first instance to ensure rapid results,

so that case histories of successful product development can be used to stimulate yet further growth.

6.7.3 "Design Clinics" to be based on facilities of existing institutions such as NDI, IDC and PDI, but staff to be permanently augmented for the purpose.

INDIA

6.7.4 Industrial Design Centre, I.I.T., Bombay

The provision of a visiting/corresponding professor of design ("co-ordinating designer") with wide experience to assist the future development of the I.D.C.

6.7.5 Bulk Products Survey

The creation of a research project to make an economic study of the value of the export of manufactured products versus bulk products.

6.7.6 Leather Goods

To establish a design unit at the leather goods industry centre at Madras in conjunction with the National Institute of Design, Ahmedabad.

PAKISTAN

6.7.7 National College of Arts, Lahore

To re-equip and re-establish an industrial design course at the N.C.A. This means starting completely from scratch; only the buildings exist. Such equipment as is there should be disposed of and replaced. A three-year appointment of a senior designer/academic is essential.

6.7.8 Projected College of Design, Karachi

To encourage the future development of plans for the

establishment of a College of Design in Karachi in the shortest possible space of time, and avoiding the inclusion of Fine Art based studies.

EGYPT

6.7.9 College of Applied Arts, Helwan

The provision of a visiting/corresponding professor of design ("co-ordinating designer") with very broad experience to assist in the development of the design courses offered at the College of Applied Arts, Helwan University, and additional experienced permanent staff.

TURKEY

6.7.10 Middle East Technical University

To assist and encourage the establishment of a Design Course as part of the Faculty of Architecture at METU broadly in line with the 1971 Munro Report.

6.7.11 Istanbul Academy of Fine Arts

The provision of a visiting/corresponding professor of design as general assistance to the existing course.

6.7.12 Note: There are no proposals for conventional seminars or exhibitions - the latter are expensive and of doubtful value and as to the former, enough has already been said. What is needed now are not words but DEEDS.

7. CONCLUSION

7.1.1 As has been previously stated, all of the promises to send information in time for inclusion in this report have been honoured. Furthermore I have received correspondence from three of the countries visited on my mission and it is clear that progress is already being made on a number of suggestions that I was able to make on the spot. To be kept informed after one has left the scene if most encouraging and bodes well for future developments.

7.1.2 Every country tackled the problem of arranging my programme in a different way in accordance with their own particular ways and possibilities and I am quite happy with the result.

7.1.3 No attempt was made to hold a national one-day seminar in any of the countries visited, for which far greater preparation time would have been needed. The meetings that were held were in every case successful.

7.1.4 An astonishingly wide range of contacts was made in the time available. In addition to being able to make a thorough examination of no less than seven educational establishments, I have not counted the number of government offices and factories, I ate in five works' canteens and visited a number of homes in town and village, and roamed streets and market-places.

7.1.5 I had no contact with television or radio but gave a number of interviews to the Press. I am impressed by the quality of the journalists who have accurate reports of what I said and about the visit generally - this has not always been my experience! And it seems that the editors are prepared to devote a great deal of space to discussions of design matters. This again bodes well for future developments.

7.1.6 This report inevitably raises more questions than it answers. More work is urgently needed to develop the work that has been started and to fulful hopes that have been raised.

7.1.7 Industrial design cannot be slotted into neat compartments: it is a wide-ranging human activity which encompasses many professional disciplines and respects no administrative demarcation lines.

7.1.8 The need exists, the will exists, the ways and means to help must be found.

7.1.9 Perhaps therefore I might be permitted to conclude by quoting passages from an article which appeared in the "Economic Times", Bombay, 28th May 1978, nearly three months after my departure from India, as it seems to me to be an excellent summary of the situation:

" "Self-confidence is what your industrial designers lack".. Prof. Reid made no secret of his impression that Indian designers had the potential. They could go a long way in spreading design awareness, not only within the country, particularly among the vast numbers of small and medium-scale industries, but also in the entire third world. "But your designers must develop confidence in their own ability and stop looking elsewhere, particularly the western world, for solutions to the problems in developing countries".

" The diagnosis has not come a day too soon. It was based on what he saw, discussed and perceived during a two week-long hectic tour of Bombay, Ahmedabad and New Delhi, during which he visited a number of big and small industries, spoke to scores of people and roamed streets and market-places to find for himself the richness of India's traditional way of living.

" His recommendations to UNIDO will eventually pave the way for assistance to India in spreading design movement. India has already won international recognition in design development when the first ICSID-Philips Award for design in developing countries was bagged by the National Institute of Design, Ahmedabad, in 1977.

" The small community of industrial designers is on the horns of a dilemma. "We are at a peculiar juncture. We have the know-how but we do not know how to apply it to a vast number of industries, especially in the small and medium-scale sectors", Prof. Kumar Vyas, a senior member of the faculty of N.I.D. said.

" There is much confusion about the meaning of the very term "industrial designing". While a large number of industries take it to mean some peripheral beautification of a product with some functional utility on the side, others tend to mean it as something to do with plant designing, a job performed by industrial engineers. Very few seem to grasp that industrial design is not necessarily either; it is an understanding of the function of a product or environ from which spring an attempt to improve. In this sense its role is multi-disciplinary.

" It is true that the sellers' market in many lines of production has made industrialists complacent to the potential of a better design to improve the turn-over and profits over a longer period. But, the situation is slowly changing and it is precisely here that the vast gulf between the designers and industries pose serious problems.

" In 1974, NID had tried an experiment at design solutions for a number of industries at an industrial estate of the Gujarat Industrial Development Corporation without

much success. "While there was dire need for a better design, the industries did not understand what we were talking about, and we did not get clearly what their problems were", Prof. Vyas said.

" Prof. Reid perceived that this was because designers viewed a design problem in isolation, working as solitary problem-solvers. They were trying to work on the same lines as they had done in bigger industries, copying western style.

" The problems of a small-scale or a medium-scale unit are, however, much different. This was brought home forcefully while on a visit to a small machine tools unit. The product design got inevitably mixed with problems ranging from finance to marketing for which neither the designer nor the industrialist had the requisite expertise.

" What was more, a great many of these units might not even know that they had design problems. A designer's task would, therefore, be not only to identify the problem but also work out solutions in relation to various managerial aspects.

" "This cannot be done alone by a designer, however versatile he may be", Prof. Reid said. What is needed is some sort of clinic which will have avenues to draw on the talents of a variety of experts in different disciplines and co-relate with the design solution to the best advantage of the small man. A designer has to become part of a bigger team of experts and understand the perception of the problems to be solved in their totality. The entire production flow may have to be re-designed and not just a product in many cases.

" The industrial designer would need to become a better communicator to be able to put across his ideas and

assimilate those from the other experts. In short, he would have to be a specialist functioning with ease as a generalist.

" This would throw up twin problems of setting up cells or clinics as also of training designers to meet the challenge. Industrial designers are well-paid and can find good openings in bigger units. The clinic for small and medium unity needs designers who have a perception of other disciplines - that is, more talented designers than those going into solitary problem-solving work at bigger units. No small unit or units can possibly either employ such people or even hire them at their full rates.

" Prof. Reid feels the solution is in setting up clinics at places like NID with subsidy from government and help from organisations like UNIDO.

" According to Mr. Ashoke Chatterjee, executive director of NID, while the idea is sound, industry's lines in which design problems need urgent solutions will have to be identified. To begin with, such a clinic can deal with problems in ceramics, plastics, electrical appliances, small electronics equipment and textiles, for which NID already has expertise.

" Prof. Reid emphasised the need for forging effective links of communications both with the industry and government so that industrial designers could not only convey newer ideas and solutions, but also get a feed-back.

" Designers and industrialists who met him came back highly impressed with Prof. Reid's perception of Indian design problems. Though a specialist, he himself has been experimenting and working in a variety of fields to acquire an insight for this quick perception.

" Designers said that Prof. Reid's visit had an immediate result. It focussed their attention more sharply on the direction which industrial designing, its training and planning in India should attempt. Happily, he found the problem-solving teaching method at NID adequate to take care of problems in big, small and medium industries. All that was needed was to set the designers on the right path and with help from UNIDO that seems very likely to happen. "

INDUSTRIAL DESIGNING IS CARING ABOUT PEOPLE

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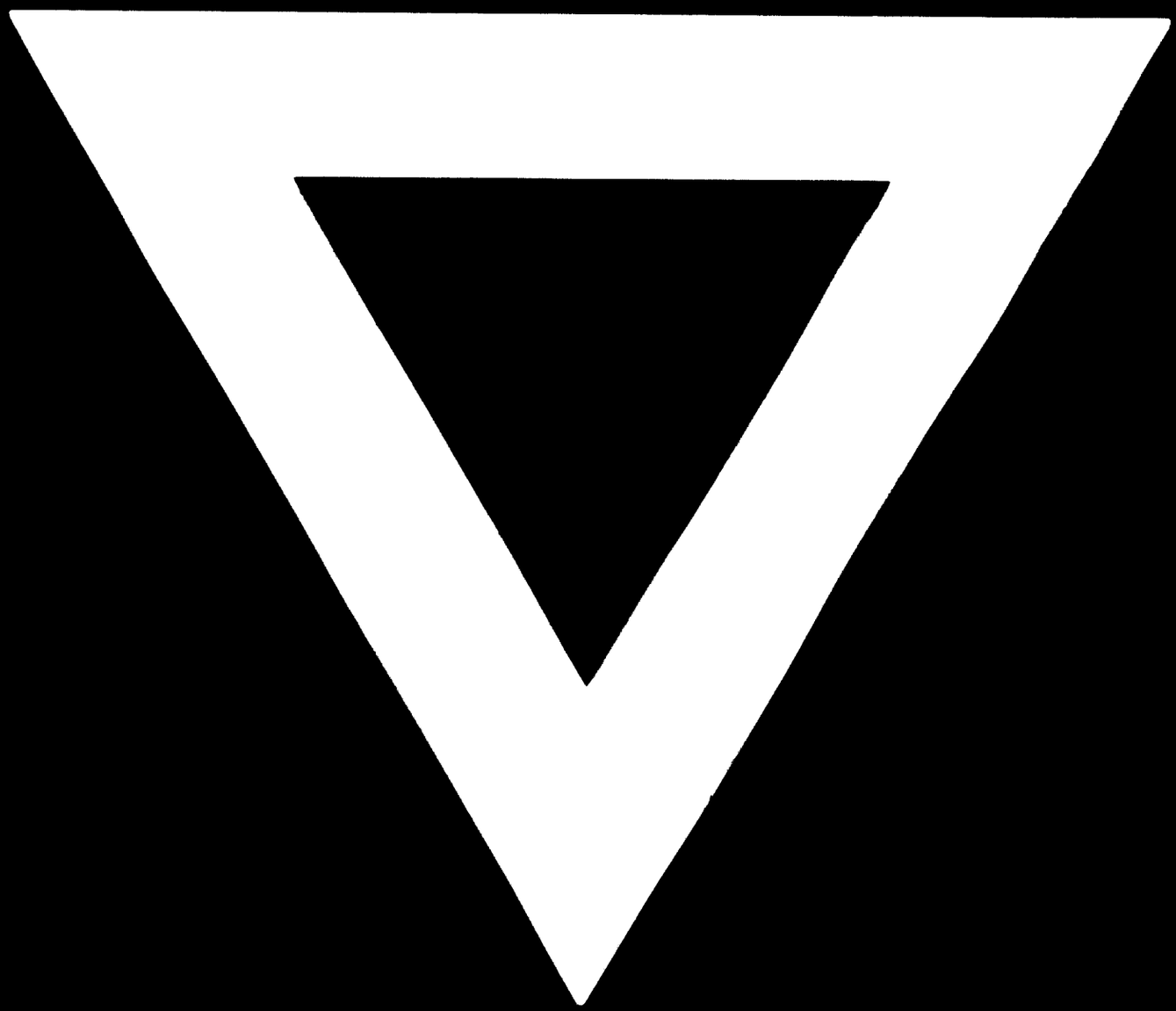

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