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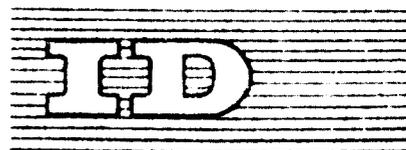
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Beirut, Lebanon, 11-16 November 1968

Agenda item 3

**PROBLEMS IN THE APPLICATION OF TECHNICAL ASSISTANCE TO
SMALL-SCALE INDUSTRIES IN DEVELOPING COUNTRIES^{1/}**

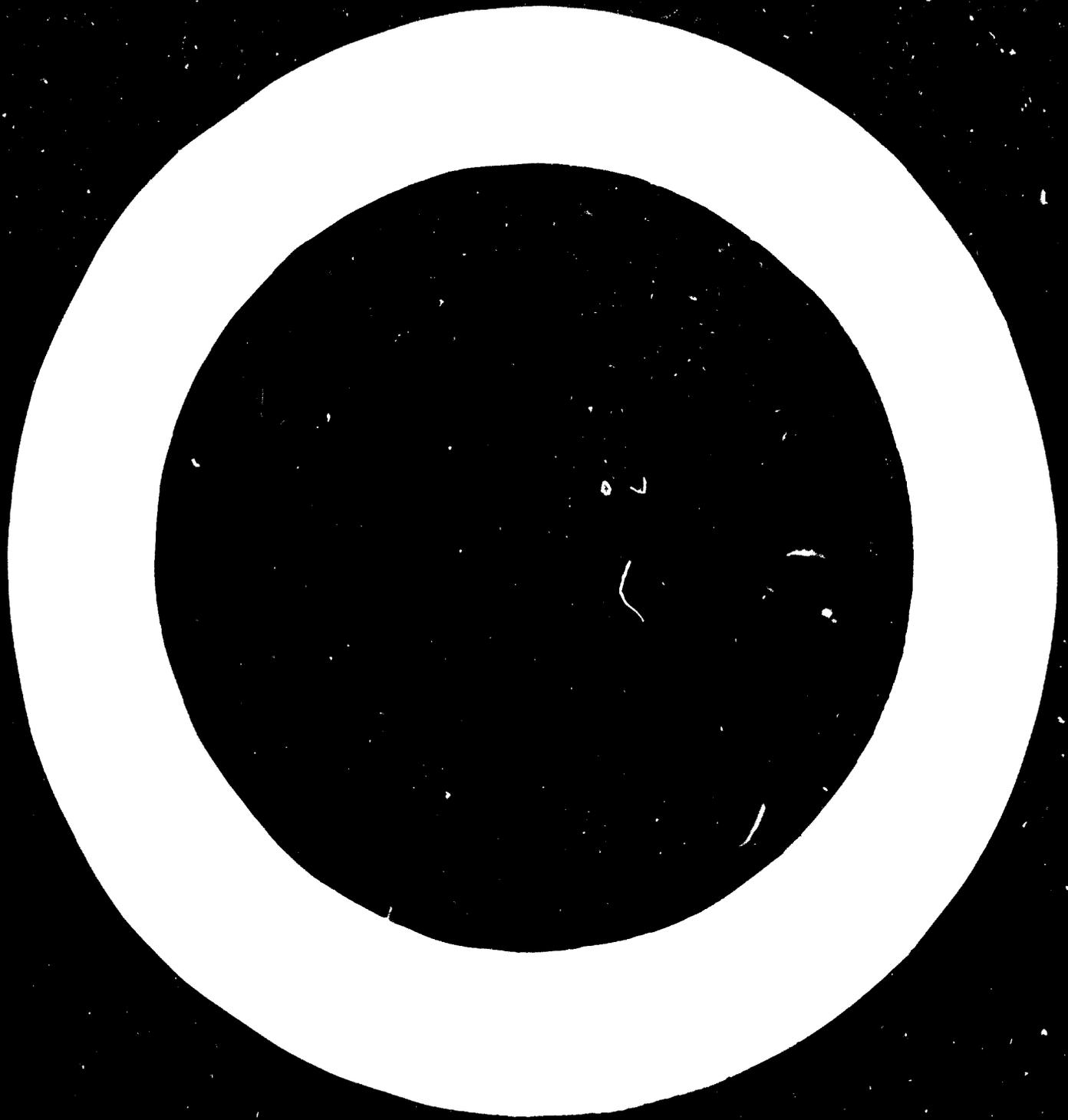
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INTER-REGIONAL SYMPOSIUM ON TECHNICAL
SERVICES AND FACILITIES FOR
SMALL-SCALE INDUSTRIES

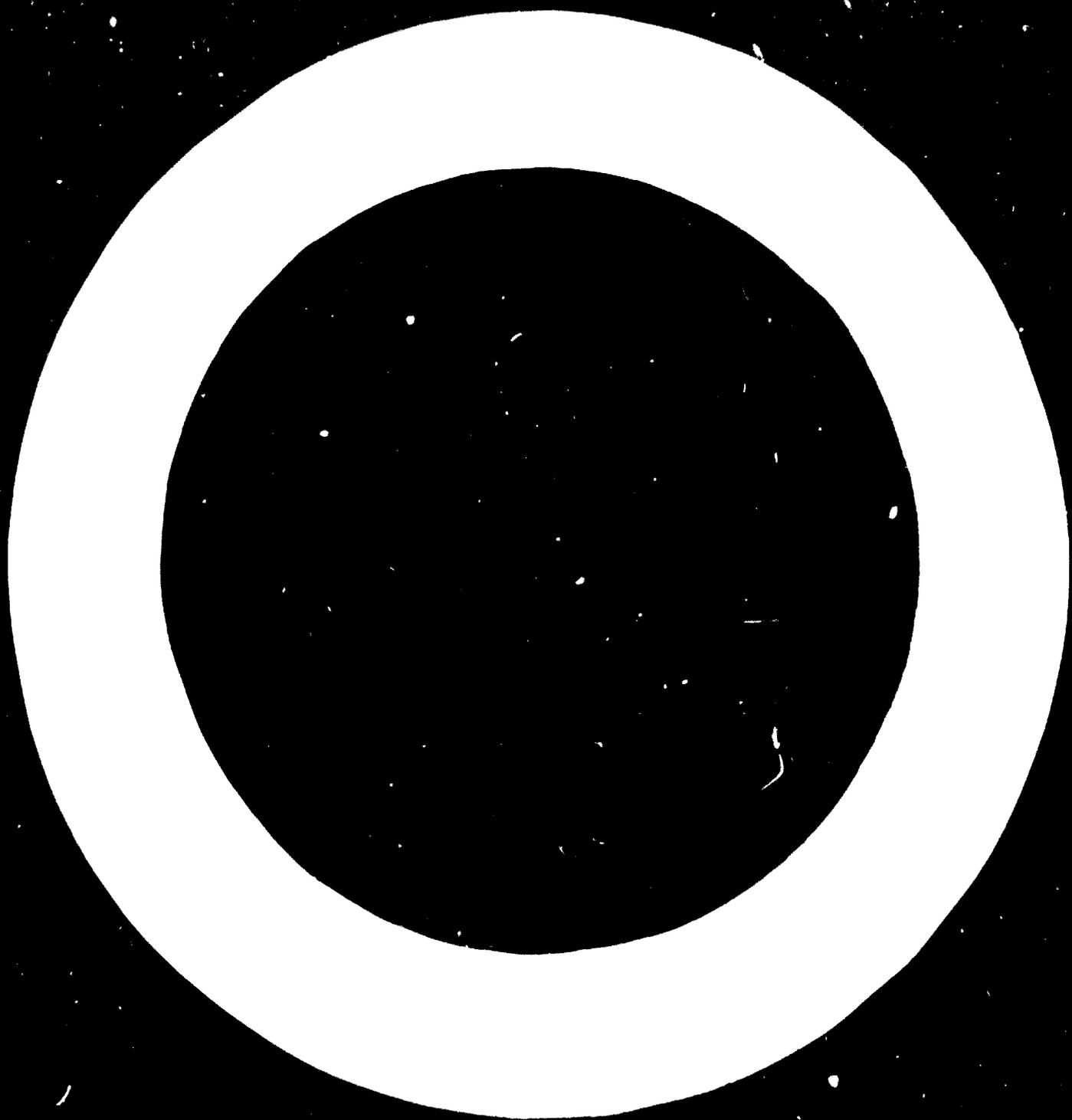
Vedbaek, Denmark

26 June to 8 July 1967

Agenda item 4

**PROBLEMS IN THE APPLICATION OF TECHNICAL ASSISTANCE TO
SMALL-SCALE INDUSTRIES IN DEVELOPING COUNTRIES**

Presented by Alexander Neilson



PROBLEMS IN THE APPLICATION OF TECHNICAL ASSISTANCE TO
SMALL-SCALE INDUSTRIES IN DEVELOPING ECONOMIES

1. The expert's assignment

The term "technical co-operation" or "technical assistance" is sometimes understood to cover not only the straight provision of professional advice but also aid with a substantial element of capital investment. For the purposes of this paper, technical assistance will refer to technical counselling and training of key personnel by a foreign expert assigned to a government. Irrespective of which label is attached, it is an effort to transfer and adapt knowledge, skill and experience to the conditions of a developing country. A mere transfer of techniques might impose so much on a traditional pattern that there would be obstacles to its practical application. Until the disciplines that are involved in such a change become domesticated the benefits of the assistance cannot be fully realized.

The over-all objective of technical co-operation is to improve the level of living in the developing economies by better use of existing human, material and productive resources. In relation to industry, and in particular to small-scale industry, the approach is to help in creating a more favourable investment climate; in increasing productivity through improved methods and training; in selecting products for manufacture to replace imports; in finding new uses for indigenous materials; in fostering the entrepreneurial spirit; and in providing incentives. These sectoral aims, which jointly constitute a development programme, have been the subject of a considerable body of literature, and it is most unlikely that they are unknown to the government officials entrusted with the development of industry. Requests for assistance, therefore, are often related less to the known objectives than to the methods by which they may be realized. This is, indeed, as it should be, provided that the requisite legal and administrative

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machinery is in existence to allow these aims to be achieved. The problem of priorities is thus introduced. What is wanted, and requested, by the government of a developing country may not be what is most needed at that moment.

The technical co-operation programmes of the United Nations and its **specialized** agencies offer to the governments of developing countries the services of experts which cover a very wide field of experience. Presented with such a choice, it is understandable that sometimes governments make requests which are superior to their actual needs, or for which they are unable to supply the necessary supporting services. Not only is this a waste of the limited funds available for technical assistance, but it is a major cause of the frustration often experienced by experts in the field.

There are other factors which may prejudice the success of an expert's mission even before he arrives in the country. It is unavoidable that a considerable period of time must elapse between the receipt of a request and the arrival of the appointed expert at his duty station. In most developing countries there is always a certain amount of experimentation leading to the formation of new and the disappearance of former government agencies, with consequent regrouping of staff functions. The result may be that the agency which formulated the request may have been disbanded and replaced by another with a completely different policy. Even under the most favourable circumstances the new agency cannot be expected to have the same interest as its predecessor had in the project.

In countries where the term of office of the government is for a fixed period, the assignment of an expert within a period of twelve months in advance of a general election is likely to diminish his chances of success. The government is too immersed in preparing its forthcoming campaign, and the office holders are too preoccupied with their prospects of re-appointment to give adequate consideration to proposals. There is a tendency to "shelve" everything until after the elections. In any case, it is almost certain that if the election results in a change of government, any scheme submitted to, and not already implemented by, the former administration will be rejected.

Small-scale industry is very seldom organized to anything approaching the same extent as its larger counterpart. As a whole it lacks the means of making known its needs to government. The framers of requests for assistance usually are

government officials with only limited contacts with this sector. It is not surprising, therefore, that sometimes their assessments do not exactly correspond to the realities of the situation. The effect of this is to divert a portion of the efforts of the expert to the reorientation of the official viewpoint, a task which may be futile if there are political implications.

The first two or three weeks of an expert's sojourn in the country of his assignment is a critical period. By and large, it is a period of mutual personal assessments. The expert is adjusting himself to the conditions in the new country; meeting the members of the ministry or agency with whom he will work; and trying to ascertain the counterpart and secretarial support he can expect. He, likewise, is being assessed by his future colleagues, not on his technical ability, for that to them is still unknown, but on his personality. It is a time for the exercise of the utmost tact - for making haste slowly - since the co-operation he will receive, in no small measure, will be determined by the impression he makes in these early contacts. Any expert who fails to secure the willing co-operation of the officials of the agency to which he is attached will find himself operating in a vacuum.

In most circumstances, the expert is anxious to start the real task of his assignment and is impatient with what seems to him to be unnecessary delays. At this point, it is essential for the expert to remember that he is an alien, that the government of the host country has developed the procedures it considers best suited to its needs and culture, and, in any case, that he should not offer gratuitous advice. Usually, it is possible to expedite matters through friendly and informal discussions with the officials concerned. Only as a last resort is it advisable to make an appeal through the United Nations Resident Representative. While this, no doubt, would be successful, it is likely to prejudice relations with the middle level officials with whom the expert will be most in contact.

It is not common, but certainly not unknown, for an expert to sense that there is hidden resentment of his appointment. Some of the officials of the agency to which he is attached may feel that they do not need advice in the expert's particular field, and regard his presence as a reflection on their competence. Others may regard the acceptance of assistance as being in some way related to dependency upon a foreign country. As Shonfield states, "it is bad enough to be poor; to have to

rely on another man's bounty for ideas as well is liable to turn even a normally sensible personality awkward and stubborn.^{1/} While these feelings may be more understandable in connexion with bi-lateral than with international assistance, none-the-less they exist and have to be overcome. And overcome they can be: by the expert admitting that he has as much to learn from the people of the country as they have from him; by initially identifying himself with the official outlook as far as is possible; and by pursuing a policy of suggestion rather than assertion. This is not to advocate that the expert should not take a firm line when he is convinced the circumstances demand it. That may come later, but it is unlikely to receive the consideration it deserves if the expert has not himself won the acceptance of his colleagues.

At this point it is perhaps appropriate to consider the problem of counterparts. It is almost always written into the technical assistance agreement that the recipient government shall appoint a counterpart to work with the expert with the object of continuing the work initiated by the latter. The success of a mission can depend to a great extent on the ability and enthusiasm of the counterpart. The ideal arrangement is for the counterpart to have had a similar technical training to the expert, some practical experience in his field, and to be in a sufficiently senior position in the government service to be able to continue the work after the expert has left the country. If these requirements are not met, the relationship between the expert and his counterpart will not be one of co-operation: at best, it will approximate that between teacher and pupil; at worst, the counterpart will become an interpreter and guide.

It is seldom that the government of a developing country is able to appoint a counterpart who fulfils all of these requirements. Sometimes no counterpart is provided. The country usually is deficient in experienced, professional personnel, particularly those in the engineering professions, and the salaries offered in the government service fail to attract the few who may be available. Furthermore there may be reluctance on the part of those otherwise suitable to act as counterparts, because they feel that by so doing they may miss an opportunity for promotion. Often

^{1/} Andrew Shonfield, *The Attack on World Poverty*, page 180, Chatto & Windus, London 1960.

the only way government is able to supply a counterpart is by recruiting an inexperienced graduate. No matter how high the standard of his qualifications, unless this is tempered by some practical experience, he cannot be regarded as a true counterpart, and his junior position in government service does not augur well for the continuance of the project after the expert departs.

In many ways it would be more advisable for governments, in this connexion, to place less emphasis on degrees and more on practical experience. The world over, the salary structure in government service is based on academic qualifications and length of service. As long as there is an inadequate number of government officials with university degrees, there is no simple solution to the counterpart problem.

The foregoing remarks, which relate to what may be described as the pre-assignment factors, are necessarily subjective, being based on the writer's personal experience over the last five years on one-man missions of short or medium-term duration. It is believed, however, that they have a validity for most technical assistance missions of this type. In what follows an attempt is made to describe some of the problems that arise in the course of dispensing technical advice in the small-scale industrial sector.

2. The expert's approach

The giving of advice to the owner or manager of a small-scale industrial establishment is not quite as simple as it might appear. Although it may be obvious to the expert that working methods could be improved, or that the quality of the product could be raised, it may not be so apparent to the owner. It is probable that the latter considers his methods, plant and products to be equal, or superior, to those of his competitors. It is unlikely that he will not admit that improvements could be effected, but it generally will be found that these are associated with new or additional equipment and not with rationalization of existing facilities. In some instances the expert may sense that his advice is being covertly resented, and if this is the case a different approach is indicated. The cause of the resentment is either the conviction that no foreigner could possibly understand his problems, or that he associates the mission of the expert with "just another one of these government enquiries". Although it is not evident to the same extent in every developing country, there is a marked tendency for the

owners of small enterprises to be excessively secretive about their methods and costs. The entrepreneur feels that any information he may give may be passed on either to his competitors or the taxation department. There is thus a barrier of self-satisfaction, suspicion and secrecy to be overcome before the proffered advice can make any impression.

In most cases this barrier can be surmounted if the initial approach is by way of enquiring if the owner has any particular problems in the operating of his business. Usually, this has the effect of releasing a torrent of real and imaginary complaints against government policy or controls, the iniquities of his supplier of materials, his labour force, unfair competition, and the impossibility of making a reasonable profit under the present circumstances. At this point it is possible for the expert to express his appreciation of the owner's difficulties, and to suggest where he might be able to be of assistance. From there on the owner is likely to be receptive to suggestions.

A word of caution may not be out of place at this stage. The proprietor of a small-scale undertaking cannot afford to close down his operations to make radical alterations, no matter how necessary and obvious they appear to the expert. Even if these can be demonstrated to him in an unambiguous manner, he is likely to be unable to raise the funds, and he has not yet reached the point of complete trust in the expert's assessment. It is advisable, therefore, to confine initial suggestions to simple and inexpensive changes which show early results and to encourage the owner to bring his problems to the expert's agency. Once the owner realizes that these are successful, he is more likely to consider making more extensive alterations. The entire range of recommendations should, of course, be discussed with the expert's counterpart, and, if possible, the initial suggestions should be presented as the joint views of the expert and counterpart. Indeed, any means within reason of heightening the status of the counterpart in the eyes of the owner should be employed. Recommendations are not effected overnight. It is more than probable that it will fall to the counterpart to advise on the major changes after the expert has left the country.

A considerable portion of the expert's, and his counterpart's, efforts will be directed towards increasing productivity and improving product quality through better use of existing facilities. In not a few instances these two objectives are

inter-related. So far as productivity is concerned, good housekeeping, reduced handling and improved working conditions are measures that are likely to be necessary in many small-scale undertakings, regardless of the nature of the operations carried on, and which can be implemented at very low or at no cost.

It might be argued that what it is hoped to gain by piece-meal introduction of the foregoing measures could be achieved, to a greater degree, by plant re-layout. That is true. but it is also true that in the small-scale sector it is, more often than not, impossible to redesign the layout. There are several reasons why this is so. Firstly, the undertaking very often is accommodated in premises that were built for commercial or domestic use which are cramped, badly lit and poorly ventilated; frequently the available floor area is sub-divided by structural members that cannot be removed. Secondly, the type of construction may be such that overhead lifting devices cannot be used; the shape of the floor area and the relative positions of doors, window openings and internal staircases may militate against a rational work-flow. And, thirdly, the owner of the business may not be prepared to accept either the loss of trade during the alterations or their expense. Not all of these objectives are present in every case, but, in the writer's view, one or another of them is to be found in the majority of instances. This is not to deny that there are exceptions where a new layout is desirable and possible both physically and financially. It is not unknown, in a situation like that, for the owner to accept an interruption of his activities for this purpose.

It has been the writer's experience that, with the exception of factories regulated by legislation designed to ensure clean food or drugs, the standard of housekeeping in workplaces in the developing countries is very low. It is almost the norm for floors to be cluttered with tools, jobs in progress, scrap or raw materials to the extent that access is severely restricted. In extreme cases there may not be sufficient free space to work in safety. The cleanliness of walls, ceilings and windows leaves much to be desired. Not infrequently the fabric of the building, particularly floor and roof, is in a poor state of repair. The result of good housekeeping is not just a cleaner, healthier and tidier workplace. Improvements are reflected in higher productivity; one authority estimates that an increase of 10 percent is possible by this means alone. It is a factor in the reduction of accidents, and it can release capital through the sale of surplus and often useless material which formerly was allowed to accumulate. More importantly it can be introduced with very little disruption of the work being carried on, and the results are immediately apparent.

The cost of handling materials in a small factory can be excessive, particularly if the products are heavy. Not only may the layout impose unnecessary distances over which materials must be moved, but often the size of the establishment is such that skilled and, therefore, highly paid labour must be pressed to assist in these transfers. It may not be possible to eradicate all the unnecessary handling, but generally it is feasible to reduce it substantially. The provision of benches or stillages, at appropriate levels and points, on which work-in-progress may be held between operations, eliminates the effort of raising and lowering work to the floor. The use of baskets or tote pans to carry goods in bulk can save needless trips. Where a hand operation is scheduled to be done between machinings, the placing of a work-bench at the site can avoid carrying the part to the fitting shop. In the aggregate, simple and inexpensive measures such as these can have a marked effect on operating costs.

It has been the writer's experience that the most serious material handling problems arise in sawmills. It would appear, in the small-scale sector at least, that little consideration is given to the labour involved in loading a log onto the table of the breakdown-saw and in handling the cut flitches. It is not uncommon to find a log of considerable girth and length being manhandled from the stockpile to the saw bench - a task that may require the entire labour force of the sawmill. In one sawmill where this was the practice, it was possible to build a stillage onto which logs could be rolled from the timber lorries, and from which a log could be rolled as required on to the sawbench. Unfortunately in this case space did not permit more than 6 or 7 logs to be held on the stillage at one time. On account of other factors it was not considered feasible to reduce the labour employed. Their duties were much less arduous, and the time the saw was actually cutting was increased by about 15 percent. More often than not cut flitches, as they are removed from the breakdown-saw, are placed on the floor. The labour of raising and carrying them to the resaw could be avoided if they were placed on stillages of suitable height along which they could be pushed to the saw.

The working conditions in many small-scale establishments can be very poor; especially so if the premises are converted dwellings or shophouses. The principal defects are uncleanness, bad lighting and ventilation, lack of sanitation,

inadequate workbenches, and overcrowding. Often the best advice would be to suggest a change of quarters. The owner may have considered this solution, but be convinced that any move outside of the immediate neighbourhood would adversely affect his business. This partially explains the reluctance of some proprietors to relocate themselves on industrial estates. Within the limits imposed by the type of workplace, it is possible to suggest improvements such as a higher level of illumination where precision work is being done, means of shielding workers from heat emissions in certain processes, the screening of electric welding operations, and the provision of an adequate number of workbenches of suitable height. In some cases it may be possible to recommend that chairs are supplied to allow the work to be carried out in the seated position. It is common in developing economies to find establishments engaged in the assembly of imported components into such articles as radio receivers, ball-point pens and domestic electrical appliances. The correct positioning of the various component bins with reference to the operative, and, in particular, to the hand used by the operative to pick up and secure specific components, can substantially increase productivity at very little cost.

3. Technical improvements

The foregoing suggestions, in the main, relate to non-technical improvements. It will, however, be apparent to the expert that there is often room for improvement in the actual operation of the equipment. The defects are likely to be connected with the speeds at which machines are run, the use of incorrectly shaped, sharpened or adjusted cutting tools, the lack of simple jigs, the inadequate provision of measuring instruments and hand tools, and poorly maintained plant. All of these factors can, and do, adversely influence quantity and quality of production. Two deserve special emphasis on account of the frequency of encounter and their far-reaching effect - lack of tool sharpening facilities and neglect of maintenance.

In every industrializing country in which the writer has worked, there has been a dearth of equipment to sharpen wood and metal cutting tools. The deficiencies, in the woodworking field, generally are in connexion with the sharpening of hand and circular saws, and the sharpening and adjustment of planer and jointer knives. The dressing of these tools by hand is a tedious and time-consuming task,

and rarely is the result as satisfactory as when carried out on one of the appliances designed for this purpose. Indeed, in respect of either a band or circular-saw the life of the blade frequently is substantially reduced by hand sharpening. The small-scale metal working undertaking seldom has any means of sharpening milling cutters, reamers and taps. It is very rare to find cemented carbide tip tools in use on account of the lack of equipment to dress them. The use of blunt and incorrectly adjusted cutting tools not only reduces the rate of production, but results in inferior finishes. The appliances needed to correct this situation are relatively expensive, and might be beyond the resources of the proprietor of a small establishment, who, in any case, would not be able to make use of them at anything approaching their rated capacity. Commercial tool dressing services seldom, if ever, are available in developing countries, and the small entrepreneur appears to be disinclined to obtain these services from a larger competitor who possesses the necessary equipment. The provision of these facilities by co-operatives, trade associations or on an industrial estate would be most useful.

Maintenance, in the context of small-scale industry, usually means effecting repairs after a piece of equipment has broken down. The notion of preventive maintenance is confined to the modern and higher echelon of this sector, and even there seldom can the procedures be described as planned preventive maintenance. The small entrepreneur finds it difficult to understand why it should be necessary to shut down a machine for adjustment while it apparently is operating quite satisfactorily. He regards the breakdown of plant, and consequent lost production, as a normal hazard of his operations. The most he is prepared to do is to keep a small stock of spares, and this is by no means universal. Very often a machine has to stand idle until replacement parts can be obtained. It is probable that to some extent this attitude is attributable to lack of accepted standards, but it is curious that it does not extend to the servicing of motor vehicles at pre-determined intervals; the necessity for this is almost always accepted.

The effective operation of a system of planned preventive maintenance involves a considerable amount of documentation in the transfer of instructions from the master to the daily work sheets, and in the recording of information. Small-scale industry, as a whole, has not reached the stage where it is necessary for the management to transmit instructions in writing. The imposition of such a

discipline would be so foreign to normal practices that it would be rejected. Yet substantially the same results can be achieved by instituting regular maintenance periods in which the necessary tasks are performed by the machine operators. Such instructions as "Oil every Monday morning", "Check clearance every day" or "Wipe down every Friday evening" can be stencilled at or on the appropriate items of equipment, and if the management, over the first few weeks checks that these have been carried out a reasonably good standard of maintenance will be attained. Alternatively one morning a week may be set aside for maintenance work. The really difficult task is to convince owners that the time so spent is not lost, but will be more than recovered by the elimination of forced stoppages.

The quality of the goods produced at small-scale industry level is a subject about which it is almost impossible to generalize. At best they are excellent and in regular demand, and at worst are salable only in an uncritical market at very low prices. Somewhere between these extremes is the product of the average small-scale undertaking, and in some trades it may be nearer the lower than the upper limit. Quality in relation to manufactured goods, and in particular to those that are machine-made, means consistent quality, and that is the result of standardization of materials and methods. Without this standardization consistent quality is impossible, and intrinsic quality is a matter of chance. The necessity of developing either legal or voluntary standards is appreciated by the governments of most developing countries, but few have reached the stage of publishing their own. However, current standard specifications are available from more industrialized countries. Unfortunately the general public is unaware of this, and consequently does not exert pressure on the manufacturers to comply with them. Such pressure as may be applied by wholesalers is generally in the direction of lowering costs, and may even be opposed to the production of goods of a quality that could compete with imports.

The principal obstacles to the improvement of product quality in the small-scale sector are the variations in the quality of the raw materials, the lack of inspection at intermediate stages of manufacture, and often the absence of any form of inspection or testing of the completed article before packaging. In so far as these impediments are not the result of ignorance, they are related to the

lack of accepted standards, and, in the opinion of the writer at least, to a form of mental barrier to the concept that even self-imposed standards are necessary if a uniform and satisfactory product is to be achieved.

In the matter of obtaining his raw or intermediate materials the small entrepreneur in an industrializing country is at a disadvantage vis-a-vis his counterpart in more advanced territories. If he makes use of local materials - scrap, for instance, is the raw material of many small undertakings - which are themselves subject to variations, he may have no alternative but to accept them and to do the best he can. Seldom does he have access to facilities for physical or chemical testing, and his status in the industry is not such that he can afford to reject supplies if they do not exactly comply with his requirements. Where imported materials are concerned he may be at the mercy of local stockists who offer material on hand as "just as good and a little cheaper" than that which he specified; he may not appreciate the differences between materials bearing the same general name but of different specification. In relation to imported materials usually he is price rather than quality motivated. He subscribes, unfortunately, to the same belief that he deprecates in his customers, that imported goods must necessarily be superior to local products.

Not every small-scale undertaking, of course, has these problems. They are, however, particularly evident in the metal working industry. While the knowledge of hardening and tempering is commonplace, the selection of special steels for particular duties is seldom practised, and the physical properties of an iron casting more often are the result of chance than design. In fairness to the small entrepreneur, it must be stated that he seldom has the means accurately to control heat treatment, or the equipment to finish hardened parts. On the other hand, the writer is aware of more than one instance of heating and quenching being carried out with the object of hardening the cutting edges of agricultural tools, unaware that the material employed was dead-mild steel. In the matter of using the correct material for the job the expert can give useful advice. Whether this is accepted or rejected will depend on whether the owner considers his profits will be increased or diminished. The most the expert can hope for is that he will make the suggested change when his present stock of

material is exhausted. And that may be some considerable time hence, as there is a marked tendency for small-scale establishments to carry unduly large inventories.

In a developing economy, the small industrialist is unable to exercise adequate control over the extent of the inventories of imported materials he is forced to carry. Even in relation to indigenous materials he may not be his own master. The textbook theory that inventories can be equated to projected production and sales characteristics does not take into account such factors as size of minimum order acceptable to his supplier, unpredictable delays in obtaining import licences and irregular shipping connexions. To give an example, a firm engaged in the manufacture of straw brooms used imported wooden handles. Although the sales of brooms amounted to only 3,000 dozen per annum, the minimum order that could be placed was for 5,000 dozen handles. The manager was aware of the disadvantages of tying up capital in this way, but there was nothing he could do about it. Indeed, he made the position worse by assembling brooms to the extent of his materials and so was forced to carry stocks of finished brooms in excess of annual sales. In this instance a solution was found in making arrangements for broom handles of the requisite quality to be made locally, and to be supplied as required. The delays in obtaining import licences, in so far as these are not on account of non-availability of foreign exchange, are avoidable. However, in many emergent nations the procurement procedures are cumbersome and time-consuming. Often the officials dealing with the applications have no real knowledge of the materials in question. It is not surprising, therefore, that the applicant is inclined to place an order for more than his foreseeable needs in the belief that it may be reduced by the control, or to avoid repeating the wearisome process in the very near future.

Where there is no difficulty over delivery the small industrialist is still inclined to over-order. To some extent this is due to his experience that prices generally have an upward trend, but it is, in the main, related to the lack of planned production, which in turn is linked to the absence of any projection of sales. Some entrepreneurs intuitively are able to estimate closely their possible sales, and with them there is no problem. Generally the reverse is true. It is not easy for the small manufacturer to assess the potential demand. His sales organization, if it exists at all, is rudimentary. Often he is in competition with foreign producers, and his share of the market may be just what importers are

prepared to allow him. The best advice that can be given, in the writer's opinion at least, is to persuade him to employ a marketing agent. The established importing houses, which are a feature of developing territories, are well aware that the nature of their business will change as industrialization progresses, and that they will be forced to act, on an increasing scale, as distributors of local products. Their knowledge of the local market and export possibilities can be extremely useful to the small manufacturer. Frequently they are prepared to enter into an agreement to handle the entire output. This guaranteed outlet allows the manufacturer to plan his production and to adjust his inventories to the current situation.

The examination, between operations, of work in progress, with the object of ascertaining that it complies with certain pre-determined standards is fundamentally foreign to the small-scale sector in countries commencing to industrialize. The fact that the rejection of defective or sub-standard pieces at an early stage in the process not only will help to maintain a uniform high quality, but will save further unproductive work, and will minimize the amount of scrap is not appreciated. It often will be found that the only concession made in this direction is a cursory inspection prior to packing for despatch. It is not that the owner or manager is unaware of this aspect of quality control. Indeed, he carries it out in an attenuated form each time he rejects or attempts to repair an obviously defective part, and he may be aware that some of the more progressive concerns in the sector practice quality control, but, by and large, he regards it as some sort of mystique of the large firm. Where this attitude is evident it is more than a mere reaction against innovation. There is some sort of psychological resistance. The writer feels certain that most experts have had experience of this barrier, if not in connexion with this particular problem, at least with some aspect of technical change.

This mental barrier must be overcome. It is the basis of the frequently made charge that import substitutes are inferior in quality to the originals. The indictment is sometimes true. So far as the small-scale sector is concerned, the writer believes that, if quality control is divorced from the jargon and "gimmicks" that surround it, it could be introduced in a simplified form. The procedures based on statistical quality control are unlikely to have any application to small-

scale industry. The techniques to be employed must be specifically related to the requirements of the job. The small manufacturer is certainly interested in knowing why his product is not selling as well as it might, or why consumers prefer the imported equivalent. The initial approach is to help the manufacturer to discover the reasons by critical analysis of his product. Once he has pinpointed the one or two defects responsible he will make sure they do not arise in future, and he is well on the way to institute quality control. An example of this recently came to the writer's attention. A firm of furniture builders required 2,000 pairs of veneered lamina-board chair arms. A licence to import the arms was refused as a local source of supply existed. Samples were submitted, and an order was placed by the furniture builder, with some misgivings, which stipulated a rate of delivery. The first delivery was made according to schedule, but some 60 per cent of the arms were rejected. The matter was investigated, and it was found that almost all the rejections were on account of variations in the curvature of the arms. The supplier was contacted, and it was found that he was, in the final forming operation, clamping two arms in the bending jig in such a way that one was outside the other and consequently had a greater radius. After bending, rebates were cut on one side of each arm to form connexions with the body of the chair. This determined the "hand" of the arm. As no selection was made to ensure that there were equal numbers of right and left hand arms of the same curvature, the chance of finding matching pairs was small. The jigs were altered to permit two arms being bent to the same radius, and the foreman, on his own initiative, constructed a profile gauge to check the curvature. In subsequent deliveries the number of rejects on this account were negligible.

Establishments in the small-scale sector are unable to support a separate inspection organization. The duties are likely to fall on the foreman. In the operation of a simplified quality control system he is the key-man, and it is as important to convince him of the benefits of the system as it is the proprietor. And it is usually easier. It will generally be found that the essential quality of a manufactured article is determined by one or two of the many operations performed. Once it is demonstrated where the control is necessary and to what extent, the foreman will be able to effect it. It is, of course, essential to secure the co-operation of the operatives. This will not be difficult when it is realized that

it is not a device to obtain more work for the same pay. It has been found, in some countries, that a simple chart showing the number of articles made and the number that passed the acceptance tests has the effect of stimulating higher standards of workmanship.

It is undeniable that the quality of an article is often judged by its presentation. This particularly applies to such consumables as prepared foods and cosmetics, but few products are completely unaffected by this prejudice. In the developing countries, it cannot be seriously contested that the general standards of presentation - printing and packaging - are other than very low. This is not a matter of inability to produce attractive labels and containers, as is evident from a comparison with those prepared for certain large entrepreneurs, notably the liquor trades, but of lack of attention to marketing techniques, or false economy. Not infrequently the most useful advice an expert can give is in this connexion.

In his visits to small industrial undertakings, the expert is likely to encounter problems related to the under-utilization of equipment, the continued employment of long obsolete plant, and the use of unsuitable machines. In connexion with some of these it may be possible to offer advice which does not involve radical change, but often the only real solution is ruled out by considerations of cost.

It is something of an anomaly that there should be a great deal of idle equipment in a country in the throes of industrialization. So far as the small-scale sector is concerned, the reasons for this situation are the small extent of the local market - small-scale industries are rarely export-oriented - and the paucity of efficient, low-output machinery. In the majority of cases the machinery is imported from countries in which the economic motive is to reduce the labour component in production, and, as it is impossible to eliminate it entirely, the desired result is obtained by increasing the output relative to the labour employed. Often the smallest size of available plant is too great for the entrepreneur's share of the market and, in extreme cases, for the entire national market. Even when it is feasible to operate at rated capacity for a part of the time, the result is that production costs are higher than normal and, if passed on to the consumer, may in turn reduce the already too small volume of demand.

In existing undertakings where this situation exists, the only solutions are to endeavour to increase the size of the market or, if possible, to produce more lines of goods with the equipment. The following case, which relates to the manufacture of envelopes, is an example which may be applicable to the production of other articles. A firm installed machinery to produce a fairly extensive range of the smaller sizes of "bankers" and "end opening" envelopes. The output of the plant was controlled by the gumming and folding machine which could form some 4,000 to 6,000 envelopes per hour. Although the importation of envelopes was controlled sales were poor, and in a short time the firm had some seven million in stock, and was on the point of closing down. On investigation it was discovered that importers were being allowed to bring into the country envelopes differing in size from those made by the firm. The imported envelopes differed by only a small fraction of an inch from those made locally, and sometimes were within the tolerances permitted by the relevant British Standard Specification. The owner was advised to obtain the necessary cutting dies to produce all of the standard sizes within the range of the folding machine, and the importation of envelopes within this range was prohibited. The firm is now able to dispose of the bulk of its production.

The use of obsolete processes and machinery by the small-scale sector is sometimes considered to be one of the causes of low productivity, but it is seldom stated whether reference is made to the productivity of labour or of capital. In any case, obsolescence is a relative term. What is obsolete in the United States may not be so in India or Nicaragua. It is only when a process or machine no longer is suited to the current conditions in a country that it becomes obsolescent. That is to say when the operation has ceased to be competitive, or there is no longer a demand for the products. Examples are most likely to be found in the traditional industries - spinning and weaving, dyeing, leather tanning and the processing of minor agricultural crops. Such undertakings survive only on account of protection, remoteness from competitors, or integration with more profitable units. Where such technological stagnation is found it is very difficult to offer any effective solution other than complete modernization. Sometimes it may be possible to recommend minor alterations to a process such as replacing "rule of thumb" methods by simple instrumentation, or to suggest a better method of feeding a machine, but the extent to which advice

can be given is obviously limited.

Very often a piece of equipment becomes obsolescent in an industrialized country only because a more advanced model has been developed which requires less labour per unit of production. It is economical to replace the old machine if the savings in wages will more than compensate for the capital and installation costs. In the industrializing countries the cost of labour generally is considerably lower than in the technologically advanced ones, and in such circumstances the latest and most labour-saving plant may not be the most economical. Unfortunately, it is seldom that this aspect is given any consideration. There is a marked reluctance among the owners of small-scale enterprises to purchase anything but the most modern equipment although the over-all operating charges are higher, the servicing more difficult and the output beyond their foreseeable needs. The writer is aware of not one but many instances of automatic steam boilers being installed in locations where the repair of their control systems was beyond the competence of the available facilities, where the nature of the feed water was unsuitable, and where the duties could equally well have been performed by much less expensive tank type boilers.

In many cases the interests of the owners of small manufacturing undertakings would best be served if they could be persuaded to consider the installation of re-conditioned second-hand plant. It is unfortunate that there still persist, in some developing countries, restrictions on the importation of used equipment.

It may fall within the terms of the expert's assignment, or he may consider it appropriate, to recommend the local manufacture of certain goods at present being imported. It is certain that he will be approached by entrepreneurs, with and without capital, for suggestions on possible small businesses they could start. Depending, of course, on the particular country, there usually is a fairly wide range of articles that could be manufactured at the current level of technical skills either on existing capital equipment or on machinery to be imported for that purpose, provided that the foreseeable demand is sufficient to sustain the means of production. On account of either the wideness of the classification groups or the lack of up-to-date statistics it is always difficult, and in some cases impossible, to estimate the extent of the market from official publications. Information gathered from importers and distributors may be biased,

and seldom are they willing to disclose their "mark-up". Where it is possible to make a realistic estimate of the demand for the selected product, and, more importantly, the share of the market a successful manufacturer reasonably could expect, a start can be made on the preparation of a feasibility study.

The assembly of the data for such a study can present considerable difficulty. It is necessary, in most cases, to obtain quotations for equipment from manufacturers in Europe or the United States - an operation that may involve exchange of correspondence over a period of one or two months, and sometimes produces no result at all. Similar delays are experienced in connexion with the prices of imported materials. In some countries the real cost of labour bears little relation to the official, or generally accepted, rates, as these are augmented by variable, yet substantial, fringe benefits. It is not unusual after all this to be forced to the conclusion that either the article cannot be produced in the required quantity at a competitive price, or that the projected return on the investment compares unfavourably with that which could be expected from commercial dealings. It is undeniable that what would constitute a reasonable return in the highly industrialized countries is not so regarded in the developing ones. This view is justified, to some extent at least, by the fact that both the interest rates and the risks are substantially higher in the latter countries. While it is possible to select suitable articles for local manufacture based on the use, in the main, of imported raw or intermediate materials, there is much more scope for the production of goods which contain a substantial proportion of indigenous material. As the entrepreneurs in the developing countries are by no means slow in seizing opportunities, it is usually the case that the obvious possibilities have been exploited. A field that sometimes is neglected is in increasing the extent of the processing of export materials.

It is often maintained that the shortage of technical skills is a factor responsible for the slow rate of industrialization in some countries. It generally is the case that a considerable proportion of under-skilled or semi-skilled workers are found in what are usually regarded as skilled occupations, but it is wrong to suppose that there is any real difference in the level of skill between skilled operators in developed and developing economies. The fact is that throughout Asia, the Middle East and certain parts of Latin America, the

old skills are being lost because they are no longer in demand, and the disciplines that the new skills involve have not as yet become fully acclimatized. While it is not denied that vocational training can do much to ensure increasing numbers of workers with at least basic training in their crafts, the impact is often much reduced by the wastage that takes place. It was estimated by the principal of a vocational school in Turkey that, over the past two years, 20 percent of the students had found employment at their trades, and he regarded this as a significant improvement. This wastage is the symptom rather than the cause of the malady. In the developing countries the recruits to industry are drawn principally from the agricultural communities. The personal adjustments that are necessary to conform to the new environment can be very great. Is it any wonder that many fail to make the grade?

The shortage of skilled technicians, in so far as it means a dilution of skills in many establishments, can, and does, affect the conduct of an expert's mission. It makes it necessary for him to modify his conception of what is practicable, and to accept the fact that if progress is to be made, it must be made slowly. Perhaps what is even more serious than the lack of adequately skilled workers is the dearth of good foremen. A competent supervisor can do a great deal to make up for the deficiencies of the men under him, and a poor one can neutralize the best efforts of the most skilled team. In some countries the qualities that go towards making a good foreman are foreign to the way of life. A Malay overseer will hesitate to reprimand a worker, no matter how much it may be deserved, because he is afraid of getting a "bad name". In some cases the intricacies of family relationship within a small factory, even if the will is there, make the maintenance of any form of control very difficult. The need to develop foreman training is very evident.

The small-scale sector suffers, in most countries, from a shortage of capital. While, undoubtedly, this restricts growth and perpetuates uncompetitive methods, the lack of competent, aggressive management is a contributory factor of almost equal importance. The latter, at the very least, retards the implementation of, and may nullify, the suggestions the expert has made in the way of improvements. The manager of the average small undertaking needs training not only in management techniques but also in costing. It is no exaggeration to state that few of them know, with any reasonable degree of accuracy, the cost of production of their products.

It is not unknown for small entrepreneurs to disregard such factors as interest on borrowed fund, depreciation and maintenance charges, and even rent. Any suggestions to maximize profits by variations of the product mix, in these circumstances, are futile. It is not that the manager is less intelligent than his counterpart in a more developed territory, but rather that his cultural background tends to make him place a different emphasis on certain factors. There is little doubt that the managers of many small-scale undertakings could benefit from courses of instruction in costing and the techniques of management, but it is unfortunately the case that those most in need of it realize it least. Few of them have the time and inclination to attend training sessions. For this reason, the formal approach has a limited impact. The essential, in the opinion of the writer, is to create an awareness of their needs. Once that is realized they will find the means to satisfy them.

Much has been written in attempts to explain the emergence of industrial entrepreneurship; why it should arise at a particular moment in history in one country, and not in another. There does not appear to be any substantial measure of agreement as to the evolutionary forces involved. Indeed, the prerequisite conditions are unlikely to be identical with dissimilar cultures. Perhaps, what is more important, from the viewpoint of an agency endeavouring to foster entrepreneurship, is to be able to identify the social and economic obstacles that are hindering its development. In some transforming economies, particularly those in the early stages, the deference paid to the authority of the head of the family, extended family or clan can be an adverse factor. In others, aspirations may be directed to acquiring land or cattle, with little importance attached, in terms of social status, to other forms of wealth. Where cultural elements are involved change is likely to be slow, and to come about as the result of concerted social pressures rather than by any initiated action. If economic conditions are responsible, it may be possible to create a more stimulating climate. Most, if not all, of the governments of the developing countries have enacted legislation to encourage the development of industry. The organizations that have been established to administer these ordinances, with some notable exceptions, are concerned with industry as a whole. In some instances separate arrangements are made to deal with handicrafts and cottage industry. Where no distinction is made between large and small-scale industry, or where one agency is

charged with the development of both, it is always the latter that is neglected. The expert may find that the laws designed to provide assistance or incentives have been framed with basic or, at least, large undertakings in mind, and may even operate to the disadvantage of the small enterprise. The reason is not far to seek: the establishment of a large factory has a publicity value, and the administration responsible acquires considerable kudos, while small-scale enterprises seldom are spectacular. The expert may find that much of his work is likely to be in vain unless he can inculcate in the official mind a more liberal attitude to the small-scale sector.

Industrial entrepreneurship is not just, as it is sometimes stated to be, the willingness to accept financial risk. If that were the case, there would be no dearth of entrepreneurs in the developing countries. While, undoubtedly, risk-bearing is an important and essential element, the major component is the capacity to organize the factors of production. Incentive legislation, where it exists, generally is held to stimulate entrepreneurship by reducing the financial risks involved. In the view of the writer, this is true as far as it goes, but it probably would be more accurate to say that it encourages entrepreneurs to take risks. By the award of income tax holidays and relief from import duties, as inducements to establish industries, governments forgo large sums in revenue. It is open to argument whether these grants, which in any event are more beneficial to large than small-scale industry, increase the quantum of entrepreneurship within the countries concerned. It appears probable, to the writer at least, that the incentives may only divert it from one field to another. In the matter of provision of finance, it is the practice of a government lending institution to safeguard its investment in such a way that, in theory, there is little or no risk. The result is that this aid is granted only to the possessor of, at least, a modicum of capital. The emphasis is on security - the security of the almost sacrosanct public funds - and little attention is paid to other factors. The applicant with ideas and potential organizing capacity but no capital is ignored. Surely if a government wishes to develop entrepreneurship it should exhibit it itself, and be prepared to take reasonable risks.

4. Concluding remarks

In the foregoing the writer has endeavoured to outline some of the problems encountered in the field of technical assistance to small-scale industry, and to indicate practical solutions. Seldom is there only one remedy for any given situation. Usually there are many possible cures, but, in addition to "know-how", all involve two components -- money and time. These two factors are likely to determine the practical treatment. In some circumstances all that can be proffered is a palliative. The scarcity of capital in the sector and the duration of the expert's mission impose limitations on the effectiveness of technical assistance.

There are obvious difficulties in connexion with the provision of financial assistance to small-scale industry. Such varied devices as the creation of industrial estates with workplaces at sub-economic rents and common service facilities, co-operative purchasing and marketing arrangements, the supply of plant on hire-purchase agreements, facilities for the hire of equipment, and low interest, long-term loans are used in some countries to help the small industrialist to conserve his capital. Technical advice and commercial information may be made available, either free or at only a nominal charge, through extension services. All of these measures are excellent, but not all of them can be implemented successfully in every country. In some countries small industrialists are seldom interested in obtaining premises on rental, even at subsidized rates. They desire to own their workplaces and the land on which they are built; they regard these assets as a form of reserve capital on which they can draw in an emergency. Co-operatives, particularly those imposed on an industry by a government, sometimes function more to the benefit of the officials than of the majority of the ordinary members. In one country, it is not unusual for lending co-operatives to charge interest rates as high as 15 percent per annum on loans to members, while the co-operative is able to borrow funds from the government bank at around 4 percent. Common service facilities, whether on or off an industrial estate, can be justified only if there is a sufficiently large concentration of establishments of a like kind to make efficient use of the services. Such is not always the case in the small developing economies. Some government lending institutions apply the same criteria in making loans to small-scale industry as they do to the

large-scale sector, while others may, in effect, discriminate against the former. All in all, while legislation and institutions may exist to help small-scale industry, there may be circumstances, or conditions, which tend to act in the opposite direction and so limit the effect of international technical assistance.

The writer is of the opinion that any country embarking on a plan to develop small-scale industry, with technical assistance from the United Nations, should set aside funds which it is prepared to loan, at a very low rate of interest, to entrepreneurs for the specific purpose of carrying out improvements recommended by the assigned experts. It is suggested that such a fund be additional to the normal loan arrangements that may be available to finance new projects. The fact that plant owners were aware that their government was prepared to help them to make improvements would convince them that government was seriously concerned to develop the sector, and make them more receptive to recommendations. Secure in the knowledge that the cost of the improvements could be spread over two or three years, and that technical advice would be available, most of their present objections would disappear. The fund would not need to be large, as the loans would be comparatively small, for relatively short terms, and should revolve quickly. The existence of a fund of this nature, it is considered, would remove one of the most important limitations to the effectiveness of technical assistance.

Another limitation is the time factor. A United Nations expert is usually assigned to a country for a comparatively short period; seldom does it exceed two years. It is not possible, even in the most favourable circumstances, for the expert to see all of his recommendations put into effect. Nor is it feasible for him to make all the follow-up visits and consultations that are desirable and necessary. It is true that his counterpart could assist in this connexion, but it has been the writer's experience that counterparts seldom survive the period of the expert's assignment. If technical assistance is to be other than a series of short, disconnected and unco-ordinated spurts of limited impact, it is essential that there be some indigenous organization to provide continuity of effort. An industrial extension service would be a suitable agency for this purpose. An expert operating through such a body, possibly as adviser to the director, can cover a much wider field than he could acting alone or with a counterpart. It would ensure that recommendations were adequately followed up both during the

expert's assignment and after his departure. It would provide the foundation on which succeeding experts could build until such time as experts are no longer needed.

No two developing countries present exactly the same problems in the provision of technical assistance, and, probably, no two experts will view each in the same light. It is believed, however, that the various situations which have been the subject of comment in this paper are present in some degree in every transforming economy. That there is an answer to each problem that arises is certain. In some cases an immediate and practicable solution is possible, but in others only a partial solution may be possible - a compromise until the time is ripe. Whatever advice or assistance is offered should be in accordance with the cultural pattern, if it is not to be self-defeating.





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