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# **The Communication Approach to Technical Assistance**

*With Specific Application to the Industrial  
Technical Aids Program*

**By J. BEN LIEBERMAN and ROBERT L. WOODCOCK  
Stanford Research Institute**

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*Prepared for*  
**Technical Aids Branch, Office of Industrial Resources  
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WASHINGTON 25, D.C.**

## COMMUNICATION APPROACH TO TECHNICAL ASSISTANCE

### SELECTIVE READING GUIDE

This report covers a highly complex subject, and covers it in several different ways on different levels. Hence, readers with particular interests may wish to explore in detail only certain sections.

As a guide to selective portions of the report, the following suggestions are made:

#### SUMMARY OF REPORT, pages 5-20.

##### COMMUNICATION

The communication process in underdeveloped-area terms, pages 37-42.

What a communication complex is, why it must be developed, and the kinds of projects involved, pages 43-55.

The communication approach for ICA/W and the USOM's, pages 35-37 and 73-75.

Motivating people and merchandising ideas and techniques, pages 32-34.

Cultural problems in underdeveloped areas as a factor in communicating technical information, pages 24-31.

##### CONVEYING TECHNICAL INFORMATION

Needs and problems of underdeveloped areas, pages 24-31.

Use of technical aids in conveying technical information, pages 56-62.

Guiding principles and operational techniques, pages 151-185.

Localizing technical aids materials, pages 153-161.

##### SUBJECT-MATTER NEEDS

Need for exchange of techniques among underdeveloped areas, as well as from the U.S., pages 64-66.

List of subject-matter needs, pages 257-272.

##### ICA ORGANIZATIONAL AND ADMINISTRATIVE PROBLEMS

Coordination of communication activities, including technical information, pages 66-71.

The communication approach for ICA, pages 35-37.

The communication program in the Missions, pages 73-75.

Technical information services, pages 71-73 and 77-84.

The functions of a Technical Information Officer in a country program, pages 93-102.

Organizations and channels through which technical information programs may operate, pages 85-117.

Regional operations, pages 117-121.

##### ROLE OF TECHNICAL AIDS SERVICE IN WORLD TECHNICAL INFORMATION PROGRAM

Direct role, contribution and functions, pages 142-148.

Relationship to USIA, pages 148-150, 203-206 and 242.

ROLE OF PRIVATE ENTERPRISE IN WORLD TECHNICAL INFORMATION PROGRAM

How ICA can help private enterprise in technical information programs, pages 121-142.

Private technical assistance, pages 150-51 and 231-32.

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SPECIFIC SUGGESTIONS FOR ADVANCING THE INDUSTRIAL TECHNICAL AIDS PROGRAM

Improvements in the present industrial technical aids program:

Printed series, pages 187-212.

Promotional materials, pages 219-222.

Technical aids for the use of the field service, pages 223-226.

The Technical Inquiry Service, pages 228-234.

Films, filmstrips, film loops and film cards, pages 235-246.

Exhibits, displays and demonstrations, pages 247-255.

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**PART I**

**Sections I through V**

## Section I

### INTRODUCTION

This report covers the results of a research study to determine what the International Cooperation Administration (ICA) should do to make its industrial technical aids program best serve the industrially underdeveloped free countries of the Near East, Africa, and the Far East.

Technical aids are defined as technical information in the form of publications, films, exhibits, and other media, as distinct from people who convey such information. They should also be distinguished from technical aid, which is generally synonymous with technical assistance in the broad sense of the total ICA program of technical, economic, and military assistance.

The formal work assignment and complete details of the project execution appear in Appendixes A through E. Specifically, and on behalf of the Technical Aids Branch of the Office of Industrial Resources of ICA, the following objectives were assigned:

1. To develop methods for disseminating industrial technical information effectively.
2. To devise methods for eliminating "the many impediments which hinder the use of technical information," including language barriers.
3. To develop specific media for communicating information on equipment, processing, and other types of industrial knowledge, including business administration, and for answering technical questions.

The research to accomplish these objectives included a three-month field study of conditions and technical information requirements in sample "underdeveloped" countries selected by ICA: Greece, Turkey, Iran, Lebanon, Egypt, Ethiopia, India, Indonesia, and the Philippines, for periods from one to two weeks each, with briefer intermediate stops for specific interviews. In accordance with instructions, this travel was preceded by one month in France, Austria, and Italy to study the techniques and results of ICA's technical aids program there, inasmuch as a major question was

how ICA's existing technical information program, with its previous emphasis on helping European recovery, might be converted to serve the new emphasis on the underdeveloped countries.

In an airgram announcing this project to the Missions on the research team's itinerary, ICA/Washington stressed that the study was not an inspection or an evaluation of present ICA efficiency, but was rather a planning operation for technical aids.

The basic Stanford Research Institute project team consisted of Robert L. Woodcock, Assistant Director of Economics Research, and Dr. J. Ben Lieberman, communication specialist. The team was augmented in Italy by Dr. Lorenzo Franceschini and in India by Dr. A. Eugene Staley of the Stanford Research Institute staff. Dr. Joseph E. Stepanek, consultant on loan from the United Nations, served on the team in Indonesia and the Philippines.

The team also drew upon the experience of other specialists, both within the Stanford Research Institute staff and elsewhere, as well as upon an intensive literature search, so that this report is not limited to information gathered on the project trip.

The help of many sources of information contacted during the course of this study is gratefully acknowledged. These sources are detailed in Appendix C. Particular thanks are due the various staff members of ICA, both in Washington and overseas, who made possible the smooth execution of the field work.

The formulation of the problem, the findings, conclusions, and recommendations presented in this report, by the very nature of the assignment, are of such scope as to require many pages.

The pages devoted particularly to Section III--The Problem--are required to see the Technical Aids Branch in its present context and to determine the appropriate direction of its development. This involves a reasonable examination of three fundamental elements on which the whole project hinges:

1. The purposes, policies, and operating framework of ICA.
2. The complicated cultural, political, psychological, ethnic, and techno-economic factors affecting technical assistance programs in underdeveloped countries.

3. The nature of communication per se, in its fullest perspective pertinent to the problem.

While much written material is available on each of the above elements, no treatment was found that examines them, in combination, as they apply to the problem at hand.

The orientation of a technical assistance program in terms of these three elements in combination results in "the communication approach" as used in the title of this report. ICA emerges as fundamentally a communication agency (in its technical assistance activities) to provide technical know-how to the underdeveloped countries; as it sees itself consciously in this role, it can better shape its activities to meet its problems and its opportunities.

Accordingly, Section IV presents a "maximum" outline of how ICA might proceed to expand its communication activities. This broad overview of the potential total ICA communication and technical information program is offered to serve as a framework within which the administrators concerned may determine the immediate changes necessary in the (Industrial) Technical Aids Branch. It may also serve to provide guidance for a possible reorientation of the ICA technical information program as such, to support ICA technical assistance objectives more adequately.

Section V analyzes specifically technical information organization and services for ICA industry programs, and the related links in the chain of communication. Reflecting the needs observed in the field, it suggests an expanded organization to meet these needs. This proposed organization also may possibly serve as a pattern for comparable technical information programs in other subject-matter activities.

Section VI furnishes in detail a variety of suggested improvements and additions to existing ICA industrial technical information media, and Section VII provides a comprehensive list of subjects for industrial technical aids, both sections again based on needs observed in the field.

Appendixes include an excerpt from the Work Assignment of the project, the team's field itinerary, a list of persons and organizations furnishing information to the survey team, a bibliography, a brief statement of the research techniques employed in this study, and a list of abbreviations used in the report. For easy reference, this abbreviations list is last.

The report is divided into two parts, separating material of general interest from recommendations and detailed findings of administrative interest largely to the Technical Aids Branch.

## Section II

### SUMMARY

The basic conclusion of the study is summed up in a six-word statement to the research team by a small manufacturer in central Java: "American got plenty know-how, no show-how."

The United States government agency responsible for "show-how" is ICA, in its technical assistance function. That is to say, as a technical assistance operation, ICA must not only marshal the know-how needed in the underdeveloped areas of the world, but it must also communicate this know-how to the people who need it. This makes ICA basically a communication agency, in the broadest sense of the term, but ICA does not appear to realize fully what this means. It could make more use of tested communication techniques and media, and could develop more techniques to meet the new problems of communicating technical information to technologically limited areas. Its administration could be more oriented toward the finding and flow of technical information: while ICA quite properly relies on people (administrators, technicians, and specialists), it does not provide them with enough of the tools--technical information and the communication processes for putting across that information--which can make their work effective.

Serious difficulties lie in the way of making a technical information program effective, however. The work assignment for this project specifically calls for study of "impediments to the use of technical information" and suggestions for ways of overcoming them. The results of this direction of effort constitute the major part of the report.

A simple listing of some of the more prevalent "impediments to the use of technical information" in host countries shows the complexity and difficulty of the problem--but it is part of the problem that these impediments do not all exist in all countries, nor in the same degree. The following list, however, is generally indicative:

1. Differences in language, both spoken and written.
2. Illiteracy.
3. Failure of people to recognize their own needs.

4. Host-government restrictive taxes, laws, red tape, bungling inexperience, corruption.
5. Inadequacy of technical information furnished.
6. Lack of knowledge as to availability of information.
7. Inadequacy of channels for disseminating the information.
8. Lack of sense of urgency or enthusiasm for passing information along.
9. Religious beliefs.
10. Misdirected nationalism.
11. Fear that improved productivity necessarily increases unemployment.
12. Lack of educational facilities.
13. Lack of practical training and practical attitude of the professional class.
14. Cultural attitudes: loss-of-face, suspicion of outsiders, etc.
15. Lack of funds.

Each of the above "impediments" is treated in enough detail in the main body of the report to provide the basis for understanding the recommended action. But the problem is so complex that no simple formula, no gimmick or set of gadgets can be offered as a panacea.

#### The Elements of the Problem

The Stanford Research Institute team looked primarily at the problem of disseminating industrial technical information (in accordance with the work order) but that problem can be dealt with only by taking into account the over-all pattern of ICA's communication process. This extension of scope should in no way be construed to imply any action by the Technical Aids Branch to encroach upon the prerogatives of other individuals or organizations. It was done at SRI's own initiative, for sound research reasons, to insure the broad context necessary to assess the particular problem at hand.

Seen this way, six considerations emerge as requiring more attention than they are presently given by ICA:

1. The need for developing what is called, in this report, the "communication complex"—the entire structure and arrangements whereby ideas and facts are conveyed in a country.
2. The need for a broad program of technical information dissemination per se, to augment the work of the administrators and experts.
3. The need for more indigenous know-how at the "underdeveloped" level, as distinct from the technology applicable to the United States itself.
4. The extent to which ICA should "merchandise" its technical information program or "motivate" host-country people to use technical information.
5. The opportunity for much more participation in technical assistance programs by private business both in the United States and in host countries.
6. The need for more coordination of technical information activities within ICA, between ICA and USIA, and among ICA and other international agencies.

Each of these six is treated at necessary length in the report to indicate the full implications to ICA, and particularly to the Technical Aids Branch. The points may be summarized generally as follows:

1. The Communication Complex. One of the elements which defines a country as "underdeveloped" in the first place is that it lacks a developed communication complex, i.e., press, radio, telephone, transportation, mail, books, libraries, freedom of speech, literacy, education, motion pictures, private organizations and associations, printing, advertising, trade channels, language ability, acceptance of change, etc.—anything and everything that helps to convey ideas and facts to the man who can use them. The communication complex of a country must be at least good enough to meet the needs of the technological development being undertaken, or that effort will be frustrated and ineffective. If ICA is to help a host country develop its technology, therefore, it must help develop this communication complex.

The effective development of these activities and institutions requires conscious and deliberate top-level guidance, encouragement, and coordination. Men must be assigned to this task at high levels in ICA/W, in the USOMs, in host governments, and in the various countries' information and extension services through which technical information is spread. Otherwise, not only will there be an inadequate pipeline to carry the information ICA is prepared to furnish, but the country will lack the "central nervous system" the social organism needs, to adapt the information and undertake the action indicated.

Because it is one of the important purposes of ICA to help the host countries keep their freedom against totalitarian imperialism, it is pertinent to note that the development of the communication complex strengthens the democratic fabric of a society by creating person-to-person and private arrangements and institutions, instead of centering everything in the state. At the same time, however, the development strengthens the existing government by making it easier to spread understanding of the government's efforts and achievements through all the reaches of the public, as well as making it easier for the government to carry out its developmental programs as such.

2. Technical Information. The SRI team concluded that a technical information program is as basic and economical a tool as a technical assistance organization can employ, but that the ICA Industry program is not taking advantage of it on much more than a minimum basis. There is an indicated need for a greatly increased flow of technical aids (as distinguished from experts and the knowledge they carry in their heads). Among such aids are books, manuals, pamphlets, films, slides, radio programs, technical question-and-answer services. Both for the information they contain and their effectiveness in communicating that information, they are useful in the following ways:

- a. They help an expert do his work faster and better. In one USOM, it was estimated that the 400 experts there are operating at 30-40 percent efficiency because they do not have the communication tools to get their story across.
- b. The availability of technical backstopping on specialized subject matter makes entirely practicable the use of generalists in the field, rather than specialists who are limited to one or two subjects each. This meets more effectively the varied program needs in the underdeveloped areas, and it also makes recruitment easier.

- c. There is a strong "multiplier" effect in printed technical materials available for volume distribution. Much of this material is "handed on" in one way or another, increasing the dissemination of technical information far beyond what a technician could hope to achieve by his personal contacts alone.
- d. The availability of basic materials such as supervisory or specialized managerial training makes it possible to undertake program activities which might otherwise be beyond the resources of the programs in many USOMs, especially in the smaller countries.
- e. Because technical aids are impersonal and objective, the quirks, variations, and difficulties which often occur in a person-to-person relationship are largely avoided. This becomes increasingly important as programs expand beyond the availability of qualified people for USOMs.

One important by-product of a good technical information program is the contribution it makes to the development of a host-country's communication complex, both in providing useful information to be communicated and in stimulating the host country to improve technicians and facilities for conveying it.

3. Indigenous Know-How. In the European Recovery Program, the U. S. effort was based on bringing U. S. technical know-how to bear. This influence persists in ICA, and it remains true that U. S. know-how is very much needed in underdeveloped areas. However, there is need also for techniques, processes, and equipment developed in one underdeveloped country and more immediately applicable than U. S. techniques to the conditions of other underdeveloped areas. The ICA function, therefore, should be expanded to include the gathering and dissemination of such indigenous technical information.

This is done in a small way now, e.g., one USOM may inquire of another USOM how fish are processed in that country. But it is done inefficiently and haphazardly, and with duplication of effort. Nor is there any regular basis for coordinating such efforts with the work being done on indigenous know-how by other international agencies--the UN, FAO, ILO, Unesco, the several foundations, etc.--on a working level as distinct from a policy level. There is need for a greater exchange of technical information among all such agencies concerned, to allow them to augment each other instead of duplicate.

4. Motivating and Merchandising. ICA apparently has not resolved the problem of whether to wait on "expressed needs" of the host countries or to recognize the real needs enough at least to anticipate requests and to suggest available means of meeting problems which may be unrecognized but serious. It is one of the characteristics of an underdeveloped area that its people often do not know what they need or what is available to help them, and so it would seem an integral part of ICA's function to guide them--while always resisting any tendency to make political capital or interfere in the internal affairs of a host country. Within ICA itself there is a comparable problem: too often the USOMs wait on ICA/W to provide leadership and assistance while ICA/W waits on the field to request what it wants. While local conditions make local flexibility mandatory for a USOM director, it nevertheless also follows that, unless he is told, he cannot know the full potentialities of support which may be available to him from ICA/W or from other parts of the field.

Since there are technical aids which can help a USOM operate more efficiently, and since there is technical information which can help an individual in a host country achieve his own goals better and faster, if only he would take advantage of his opportunity, it would seem only common sense (in the absence of overriding policy considerations) to "merchandise" these technical aids to the point of making them widely known and making them easier to use effectively. For a nominal additional expenditure, the total technical assistance investment can be substantially assured and expanded.

5. Private Participation. The SRI team found a number of ways in which private U. S. industry can help with the technical assistance program, and specifically with the dissemination of industrial technical information. The promotion of private trade is itself an important way, in that it increases the exchange of ideas and the transfer of know-how. Other methods, more directly related to the ICA program, include a "private cooperation clearinghouse," to marshal private contacts and cooperation as useful; a "letter-link," akin to the "pen-pal" technique, by which U. S. businessmen would be of assistance to specific "links" overseas; a "promotional materials service," whereby promotional and advertising materials of U. S. firms could be placed overseas where their know-how value could be utilized; an intensive program to help private book publishing firms get their technical books sold overseas; a similar program for publishers of periodicals, especially trade journals; a private consultants' pool from within U. S. industry to back up the Technical Inquiry Service; a program to utilize the know-how of U. S. business travelers abroad; and a closer tie-in to international trade fairs. ICA could help develop private channels within the underdeveloped

areas by providing know-how for promoting the whole area of private organizations, ranging from cooperatives to associations of manufacturers; by working with banks and other agencies for private investment; and particularly by helping the local communications industry, including advertising.

There are solid reasons why expanding the private participation will be useful: it brings businessmen together for business purposes, without taint of political considerations; it means profits to both sides; it helps develop the communication complex in private ways to offset increasingly the possible arbitrary actions of a strong central government seized by a nonrepresentative clique; it opens the flow of more technical information than could otherwise reach the end-user; it speeds the time when ICA can withdraw, by building the indigenous channels for permanent replacement; and it is certainly cheaper to the United States, at least in the long run.

6. Coordination of Efforts. ICA is, of course, not the only agency operating in the technical assistance field. The UN and the specialized agencies have a variety of programs, and there are important private efforts as well. There is general agreement that these activities should somehow be coordinated much more than they are, to avoid duplication and to take mutual advantage of others' available resources. Especially since ICA would be operating very close to areas of interest to USIA if it developed its communication functions along the lines explored in this report, there is need for more coordination between ICA and USIA, and between USIS and the USOMs on the working level. Because most ICA projects go beyond the limits of the specific subject-matter division in charge, and because the ICA program should be an integrated whole, in any case, there also is need for substantially more coordination of technical information activities within ICA itself.

#### An Over-all Solution

By the very nature of the considerations to be taken into account, as outlined above, the solution is broader than the original problem posed to SRI in this project. Once the full implications of technical assistance were faced by the project team, there appeared to be no alternative to constructing a solution to meet the larger problem. The report offers such a solution, but not in dogmatic terms. The team recognizes, first of all, that any effective program for conveying industrial technical information to underdeveloped countries must be flexible and adaptable to accommodate the necessary shifts in United States foreign policy and ICA operational policies. Second, because there are inherent

difficulties which confront ICA as it attempts to undertake changes of the magnitude involved, the practicalities of the situation may limit adoption of all of the suggestions offered. Nevertheless, the list of proposals is deliberately made extensive to give some indication of what an all-out effort would involve, as well as to provide ICA with a comprehensive list of alternatives from which to fashion a program to fit whatever degree of effort ICA believes warranted.

Inasmuch as the need is for a broader effort, and for more coordination of effort, to make more efficient use of the opportunities open to ICA as an information agency communicating technical know-how, the program as proposed for industrial technical information may also prove to be pertinent to the handling of technical information in such other fields as education, labor, agriculture, public health, and public administration.

#### Specialization and Coordination

There appears to be a substantial need for expanding the organizations in ICA/W which have the specific responsibility for gathering, integrating, and disseminating technical information in their fields to USOMs and (generally through USOMs) to host countries and experts of other international agencies. The question of whether this should be one centralized function for all subject-matter activities was considered. It was concluded, however, that there is much more to be gained by making the technical information function in each case an integral part of the line division's activities. What might appear to be an overlap is really an opportunity for crossbreeding of ideas across subject-matter lines and an invitation to unified and cooperative effort in a coordinated program. This means that such subject-matter activities as industry, agriculture, and education would each have an organization within its own structure to handle the technical aids program as a major program.

There is also substantial need, however, for coordination--particularly in the matter of keeping an overview of the communication-complex development. This could be achieved by a staff officer with some such title as Coordinator of Communication Programs, within the technical services structure. Given the basic organization of ICA along subject-matter lines, he can be effective only if (1) he does not preempt any of the prerogatives of the line divisions, but (2) he has enough rank to make his advice respected, especially by the top echelons. Working with an Advisory Board representing all of the various units involved in communicating technical know-how and in improving the communication complex, he would develop an integrated policy and program as a guide by which the line divisions might work with one another to carry out ICA objectives

most successfully. He would be especially concerned with interdivisional projects which might not be developed by any of the divisions as its own responsibility. But the responsibility for a given communication program would be charged to whichever subject-matter division was most directly concerned (e.g., helping a book-publishing industry is an industry division function, an educational audiovisual center is an education division responsibility, etc.).

At present, the line responsibility for communication programs per se rests in a staff organization, under the Office of Public Reports in the Office of the Deputy Director for Management. This is the Overseas Audiovisual Services Division (OAVS), and while it does excellent work within its limits, it would seem to be under three handicaps: (1) it cannot be properly integrated into technical services programs because it is separated from the technical services structure, (2) it is too closely connected with public relations functions to get its due separate strength and attention, and (3) its technical functions are too identified—in practice—with strictly audiovisual activities rather than communications in-the-large. There are various solutions, once it is recognized in principle that OAVS is a technical service and should be so located. The simplest seems to be to make it a staff service under the Coordinator for Communication Programs, to backstop ICA/W and the communication technicians in the field.

One reason the technical information function should be kept separated from the public information function, as noted above, is the danger of a backfire when the U. S. seeks credit for its technical assistance efforts. The assumption that "the ICA shield wins friends" is open to question. Almost everywhere the SRI team went, it was told by people in the host countries that the U. S. is "too interested" in getting credit, and that these people hesitate to ask for or accept technical assistance because such requirements as the display of the ICA shield make them feel they have been "bought" by us for cold-war considerations. Specifically, when a communication specialist is working with the mass media of a host country to help them improve, he should not be the same official who may be providing these media with public information materials, lest they draw the obvious conclusion that his only reason for providing technical assistance is to buy consideration for his "propaganda" materials.

#### The Role of the Technical Aids Branch

The needs and the opportunities of an expanded technical aids program are great, as indicated above, and the Technical Aids Branch should

be expanded to become a major service organization oriented and staffed to meet the requirements. The organizational level at which the Technical Aids Branch and comparable units in other subject-matter fields should be placed depends upon factors beyond the scope of this study; for convenience, and as an approximation, they are called Technical Information Divisions or TIDs in the report. The Technical Aids Branch of the Office of Industrial Resources would thus be the Industrial TID or ITID.

ITID's responsibilities should include collecting industrial technical information from all over the world, preparing editorial content for media by which the information is to be disseminated, arranging for production and distribution of media, conducting constant feedback and evaluation procedures, and backstopping technical information programs in the field. Strictly procurement responsibilities (now assigned to TAB in the case of films and books) would be transferred elsewhere, to eliminate administrative functions which now hamper Technical Aids Branch's usefulness as a service unit. Operationally, ITID would consist of an ITID Pool (detailed below) to obtain and process indigenous technical information, an Editorial Unit to produce technical aids, and a Distribution or Service Unit.

The ITID should work with two groups created for communication and technical information purposes:

1. A Communication Coördinating Board, the ICA-wide advisory board headed by the Coordinator of Communication Programs and mentioned earlier as part of the general coordinating setup. The chief of the ITID and the chief of the other technical information divisions, if established, would serve ex officio on the Board. The Board would be advisory to line divisions and to the Director of ICA in matters of developing balanced communication complexes in underdeveloped countries, and in technical information matters at policy level.
2. An ITID Advisory Board, made up of representatives of the various units of the Office of Industrial Resources, to advise the chief of ITID on program matters affecting ITID services.

The major channels through which ITID could receive and disseminate its information would include the ITID Pool, contracting organizations for the creation and production of technical aids, technical information personnel in the field, the Audiovisual Services, industrial technical

institutes, productivity centers, research institutes, media production centers and schools, industrial extension services, radio and television facilities, community development programs, literacy movements, schools and universities, and the private channels listed above.

For purposes of the underdeveloped countries, a greater proportion of technical know-how should be gathered from the numerous points abroad where technical assistance projects and indigenous enterprises provide a wealth of knowledge and experience on a level more appropriate to underdeveloped nations than are many advanced U. S. techniques. This knowledge is scattered around the world; a clearinghouse is needed to bring it together and make it centrally available and known. The establishment of such a clearinghouse or central "pool" in the various subject-matter divisions (or, specifically, at least in the Office of Industrial Resources) is recommended. It would have a group of experts who would have in aggregate both a comprehensive range of subject-matter specialties and personal contacts with all of the pertinent countries in the world. This would be achieved by the combination of three factors: (1) each man would be picked as a specialist in one of the broad areas of interest to the underdeveloped countries, e.g., metal-working, textiles, ceramics; (2) each would build personal knowledge of activities in the whole general subject-matter field (e.g., industry) in three or four countries by month-long visits to develop contacts, and (3) they would all work together in the same office to share and integrate their resources. As a result, these specialists could obtain the know-how available in each country on any given matter (e.g., how to make kilns) and, by pooling their experience, could prepare a manual of comparative processes for any country's use, on short notice. Such a service—expanded to cover all the various major techniques required—would avoid a prodigious amount of frustration and duplication of effort in USOMs and other agencies around the world and is nowhere available now.

One of the first duties of the Pool would be to set up close coordination with USOMs and with the UN Technical Assistance Board, Unesco, FAO, ILO, EPA, ECAFE, OAS, and other agencies, foundations, and private organizations which have been active in the field of economic development. This coordination would be on an informational level—gathering and giving—rather than on any policy level which might affect more fundamental arrangements. These organizations should in most cases be of value to ICA both as sources of information and as dissemination channels for ICA technical aids, within the framework of current U. S. policy. Because of the value of personal contact and the need for local adaptation of materials, it is believed desirable to be in touch with them at country levels as well as at headquarters.

### Technical Information Program of the USOM

The organizational structure in the field would parallel the proposed ICA/W setup. Each subject-matter division would have responsibility for communication projects within its field; a Coordinator for Communication Programs, in a staff capacity with a line-division advisory board, would help work out interdivisional projects and integrate the technical information program. On his staff would be the audio-visual (or, better, communication) specialists, to backstop the work of the line divisions. He would be advised, as in Washington, by a Communication Coordinating Board, consisting of representatives of each of the several subject-matter divisions involved.

The key to the whole technical aids program lies in the staffing of a qualified officer in each of the various USOM line subject-matter divisions, as required, to handle development and dissemination of technical information. Certainly one appeared to be needed in each of the USOM Industry Divisions the SRI team visited. Twenty-eight different, specific, and important functions for such an officer are listed in the SRI project report, and hardly any of those 28 are now being discharged. It is this kind of gap which indicates the present weakness and the future opportunity.

Called perhaps the "Industrial Technical Information Officer" (ITIO), and operating at the point where the information leaves U. S. hands to fan out into the field, this man would be responsible for stimulating the utilization of the materials provided by the ITID; he would act as a liaison between the Industry Officer and the Audiovisual Officer and other division officers, to coordinate efforts toward the most efficient spread of industrial information; he would act as liaison similarly with local offices of international agencies such as UN, FAO, ILO, etc.; he would look to the establishment of host-country information centers; he would be in constant touch with ICA/W, feeding back results of programs and needs for more information; he would help unblock local channels of communication; he would look after the proper development of facilities within the communication complex described above; he would work with USIS to call attention to the availability of U. S. industrial technical aids; he would see to the effective local adaptation of prototype materials sent out by ICA/W; and he would perform a host of other pertinent duties now undone or insufficiently emphasized and delegated.

## An Operating Program for the Technical Aids Branch

Six basic principles and 14 operating guides, based upon these principles, are suggested for technical information divisions in ICA:

### The Basic Principles

1. Materials must be localized to meet best the great and yet often subtle local differences which compound the intricate communication process in underdeveloped areas.
2. Materials produced in the United States must be kept flexible, so they can be adapted to local situations.
3. Host-country persons must be involved as deeply as possible in the production and dissemination of technical aids.
4. There must be easy and quick access to technical information, both in the field and in Washington.
5. Any "backstopping" which can be done in the United States should be done there, rather than left to the field, to free the high-overhead field staff for the jobs which can only be done in the field.
6. The host-country governments and people must be increasingly motivated to want technical information because they understand its usefulness.

### The Operating Guides

1. Materials prepared in the United States should be "prototypes," the basic product so designed as to include all the elements which should be useful to the ultimate recipient, but clearly intended as a sample from which someone in the local situation can then develop a finished product to take into account all the pertinent local conditions, including translation.
2. Translations are not especially useful, and often harmful, in technical matters at professional levels; on materials for general use, however, translations are not only necessary but must be done locally (with the possible exceptions of regional translating activities for Latin America, the Arabic-reading nations, and the Overseas Chinese).

3. Because so many local variables make it impossible for a central office to determine which medium will be most effective for a stated purpose, the ITID must make its media as basic, flexible, and interchangeable as possible to allow local experts the greatest chance of finding the right material in the right form for the given need.

4. Technical information will be used more, and its use will have more lasting benefit, in proportion to the number of local people who are involved in preparing it and disseminating it. The effort should always be to increase local participation, helping train host-country people toward the day when ICA help will no longer be needed.

5. For the same reason that it is next to impossible for a central office to determine the proper medium to use, it is almost as difficult to determine the kinds of information which are needed. The ITID, therefore, must be prepared to cover the whole range of technology in its subject matter, and all its periphery; in specific cases, it must be guided by reaction from the field, preferably through feedback (see Operating Guide No. 13).

6. The ITID must be primarily a service organization--a "can-do" service, which gladly relieves the field of all the load possible.

7. Information is a perishable commodity, and the ITID must organize to process it quickly. Urgency is the best policy.

8. Because the unit cost is low and usually gets lower as quantities increase, and because it is difficult to determine exactly where it will do the most good, the best way to insure return on the investment in technical aids is to make their distribution as widespread as practicable. They should be considered highly expendable at the recipient's level, they should be supplied in adequate quantity to USOMs, and all feasible channels of distribution should be used.

9. Utilization of materials should be promoted, to make the distribution widespread and to motivate effective use of the materials, once distributed.

10. The package is important. Materials should be appropriately prepared to be most inviting and attractive to the potential user.

11. The ICA shield and other "credit-seeking" devices should be used judiciously. The purpose of the technical information material itself is to convey technical information, to help build a country, not

simply to try to win friends for the U. S. by seeking credit for the assistance--all the more so because the claiming of credit often backfires

12. Red tape must not delay service. While administrative procedures are necessary, it is always possible to question where the point of diminishing returns lies, and in technical information programs for underdeveloped areas, even ordinary procedures can jeopardize important programs.

13. Feedback and evaluation must be built into technical information channels and media. This is all the more necessary and all the more potentially effective because the whole operation should be communication-centered.

14. The development and issuance of technical information materials should be done in an orderly and comprehensive pattern, clearly outlined to the field, to make it easy for the field to be able to identify each item, to judge in advance where the particular item fits into the program, and how it can be used.

In addition to these principles, some 61 pointers of "guidance for the editorial staff" are included in the report.

#### Specific Media and Subjects

Part II of this report is devoted to specific details of media and subject matter, for the internal administrative use of the Technical Aids Branch, in terms of its present program and expansion to whatever scope is considered appropriate. Among the media listed and described are the Technical Digest, new monthly management and development trade journals, Plant Requirements Reports, Factory Performance Reports, Process Comparisons, books, periodicals, libraries, bibliographies and book reviews, U. S. Government Printing Office publications, private commercial catalogs, technical dictionaries and glossaries, symbolic languages, services to the mass media, tape recordings and phonographs, an Office of Industrial Resources house organ, an industrial technical information catalog, promotional materials, technical aids for the use of the field service (such as manuals and source-material books), the Technical Inquiry Service, films, film loops, film strips and slides, three-dimensional miniature film cards, and the tangible media--exhibits, displays and demonstrations--such as do-it-yourself plans, a U. S. person-to-person model program, prototype exhibits, dioramas, comparative exhibits, table-top models, "put-together" cardboard models, industrial museums, trade fair exhibits, samples, casebooks of ideas, and a photo collection.

In addition, Part II contains a comprehensive list of industrial subject-matter needs, as found on the field trip, and a "Table of Industrial Technical Information Series," to coordinate with the subject-matter list as a means of determining gaps in the Technical Aids Branch media program, and to serve as a guide for the orderly classification and cataloging of technical aids.

### Conclusion

It is believed that the full program, as outlined in this report, is useful and warranted, in view of the total problem. As large and complex as the report may appear, it represents a way to bring the technical assistance program's least expensive tool to a point where it can best help make the whole ICA program more effective. The purposes behind the program make it important enough to carry to Congress, if necessary, for approval. Nevertheless, it is perhaps well to repeat the statement made earlier in this summary: the SRI team is well aware of the problems which confront any government agency, and ICA in particular, in undertaking changes of the magnitude proposed here. The approach suggested is in no sense a visionary claim of "this is it, take all or nothing." It is always intended to serve a practical purpose, with the recommended segments clearly divided and the relationships made plain, so that it will be possible for the existing Technical Aids Branch to undertake small parts or large parts, in any order of priority, and still obtain improved results.

### Section III

#### THE PROBLEM

##### A. The "Policy Perspective"

In approaching this survey, it would have been relatively simple to gather the opinions of users of the existing media furnished by the Technical Aids Branch, and to recommend whether each medium should be continued, dropped, or changed. In the same way, the "expressed needs" for new media for underdeveloped countries could have been found by interviewing ICA personnel, host-government officials, and the "private sector" in the countries visited.

However, the team could not so limit itself: the very question of whether ICA should confine its efforts to "expressed needs" is continually debated—in ICA, in Congress, and around the world.

There are serious implications in going beyond the direct request of another country for a specific kind of assistance; at the very least, it can be construed as interfering in the internal affairs of that country. Yet expressed need is not always the same as real need, and whether something is really needed would seem to be a proper criterion for an ICA program. The decision as to whether ICA is to await a specific request for aid, take the initiative to stimulate such a request, or simply offer what aid it thinks best, has a direct bearing on the methods and content of the technical aids program.

The use of the term "underdeveloped" implies some even more fundamental policy decisions that may not yet have been fully made. Some of the so-called "underdeveloped" countries have civilizations in many respects superior to those of technologically advanced countries. They are "underdeveloped" only in the sense that they have technological potentialities which could raise (by Western standards) their way of living. For various reasons, this "improvement" does not always appear altogether desirable to these peoples, especially since it seems to require a breakdown of their own standards.

This report uses the term "underdeveloped" because the very existence of a technical assistance program implies a working agreement with host countries that technological development is desired. However, the possibility that any such desire may have reservations should be constantly kept in mind.

There are other broad policy questions which have not been fully resolved: First, many of the countries have "expressed" a need for self-sufficiency; in an interdependent world, which is building a modern technology that cannot exist self-contained even in the highly developed nations, there may be doubt whether such a goal is feasible or wise. Second, many of the countries have urgent problems such as unemployment and nationalism, and projects which might be undertaken to bring about even desired technological improvement are not pushed, because it is felt they would aggravate these situations.

In many countries, one social objective is to reduce the imbalance between rich and poor, between the "big" man and the "small" men; but, again, projects which might achieve this goal in the long run are not politically feasible because they involve helping a "big" man industrialize further. There can seem to be a difference between developing industry and taking care of the great majority of the people. For instance, the American practice of "human relations" clearly is to the advantage of the worker on the line as well as to management. Yet to teach this concept, ICA would have to work primarily with management, and be made to appear to favor the "big" man with its attentions.\*

The whole question of communistic imperialism is a policy factor. Is ICA primarily a cold-war weapon, with all projects to be judged for their contribution to victory in that effort, or is ICA's prime objective a strong and stable world, with the communist threat just one of the dangers which can be avoided by successfully meeting this objective? Once more, the answer directly affects technical aids because it determines the kind of ICA program which they must be shaped to serve. The nature of technical aids is also affected by the answer to a more immediate question: how real or important is the new Soviet interest in technical assistance, and what should be ICA's reaction to it?

These are by no means all of the policy questions which the ICA program involves, but they do indicate why no glib recommendation for any particular kind of technical aids program is possible for the underdeveloped countries of the world. The most workable answer appears to be a "policy-perspective" approach, neither giving flat answers to policy questions, nor ignoring them as not pertinent, but rather developing a

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\* The communists, when first confronted with human relations as a new concept being introduced by ICA into Italy, called it "the greatest danger facing the world today."

flexible program which can take into account the particular policies at any given moment and any given place, and the likelihood that policies will shift as circumstances change.

#### B. The Operational Context

At the operational level, the technical aids program cannot be seen meaningfully except in the whole ICA context. And because ICA is a governmental international agency operating in fields also being given attention by other governments and by multilateral organizations such as the United Nations and the specialized agencies, to look at the "whole ICA context" really means to look even beyond ICA to the whole world technical assistance context.

At this level, too, there are broad questions being constantly re-examined and given different answers. These are treated in detail in this report as they become pertinent. In summary, they are the questions of (1) the specific geographical and subject-matter areas in which any technical assistance agency is to concentrate: for instance, whether in a given country--or in all countries--rural industry is considered part of the community development program, or the industry program; (2) the relationships of the various technical assistance agencies, both within and beyond these areas of concentration; and (3) broad operational concepts such as whether community development is the prime and central activity, whether a mission should work as part of the host government or keep its separate identity, whether large programs can achieve faster results, or whether the underdeveloped areas can absorb only what a few individuals can pass along firsthand to a small circle for later transmission to increasingly larger circles.

On an even narrower base, there are still other operational factors within ICA which affect the kind of technical aids program which should be recommended. The available budget is a notable example. The quality and kinds of available technical-assistance personnel is another, because media must be shaped to the people in the chain of communications as well as to the ultimate receivers. Internal organization and procedural regulations obviously affect a program, and it becomes a pertinent problem to determine whether such regulations are open to change if a recommended program could be helped by such a change. For instance, are the "ceilings" on the number of personnel in ICA/W to be considered so unchangeable that a new proposal for considerable improvement of ICA at the cost of a few more administrators should not even be made?

In these matters, also, this report attempts an approach which will offer guidance to the ICA officials responsible for the technical aids program, but which avoids flat recommendation that cannot take into accurate account all the variables and new circumstances. In essence, it offers possibilities, with a description of their function interrelation, and value, so that the administrator can put together the best combination of the offerings to meet the various policy and operational requirements before him.

To achieve this, however, it was necessary for the Stanford Research Institute team to analyze enough of the whole concept of technical assistance and the various agencies engaged therein to be able to understand the ideal role of the Technical Aids Branch in this activity. Originally, such questions came to mind as the needs to be met by such a service, gaps to be filled, possible duplication, and ways of taking advantage of existing resources. Later, it appeared that a solution to certain obstacles might well be found in increasing the activities of the Technical Aids Branch, or that certain organizational arrangements in ICA might in themselves be substantial obstacles. Thus, as the research advanced, it became increasingly apparent that no clear picture of the role of the Technical Aids Branch was going to emerge, short of an examination of basic considerations. The results of that examination follow.

### C. Needs and Problems in the Underdeveloped Areas

The policy and operational problems which might prevent the adoption of an ideal technical aids program can be considered among "the many impediments which hinder the use of technical information." The work assignment itself indicated another impediment in particular, the "language barriers," involving both literacy and the problems of diverse dialects and alien tongues. It is possible to consider cultural factors, too, as barriers--when, for instance, a religious belief impedes acceptance of a new technique. However, this report keeps the use of the term "barrier" to a minimum, because "barrier" implies a judgment in advance that the particular condition is indeed a negative factor and that it must be attacked as a problem and changed. It is preferable to speak of a condition, which may create needs (such as for interpreters and interlingual dictionaries), but which is not necessarily a barrier simply because it is different from American beliefs or makes technological development more difficult to achieve. What is involved is understanding the need (i.e., the problem) more clearly. ICA ought not aim at a goal of technological development in the American sense. For instance, if Indonesian nationalism requires its own national tongue, what ICA has to help create is an Indonesian technology which still allows the Indonesian to speak Bahasa rather than a more common language.

In other words, what appears to be a barrier to be overcome may be rather a condition valued by the Indonesian, and ICA therefore must adapt to it. This distinction cannot be made in the abstract, or generalized for all people everywhere to hold at all times. It must be decided locally\*—on the spot and at the time by the worker in the field, i.e., the U. S. Operations Mission staff member or host-government official—so that he can know what to fight as an impediment, and what to adapt to and make part of the goal.

A descriptive list of some of the more basic "barriers" and "needs" follows this paragraph. They are introduced here for two reasons: (1) they suggest the great complexity of ICA's task in meeting the needs for industrial technical information, and (2) they make clear why the team came to the one conclusion which it considers inescapable, namely that the ICA technical information program must have local flexibility, rather than following strictly and uniformly a procedure established in Washington, or using automatically and without change any technical aids produced or procured in Washington. The list is not in any particular order of importance, because that order, too, varies from one country to another.

#### Cultural Differences

While nearly everyone readily admits that there are substantial cultural differences among peoples, it is important to grasp the subtlety, the complexity, the conflicts, the dangers, the whole bewildering impact of these differences put together around the world. These are not minor matters of special names of the heroes of some folklore, or even customs and traditions. The whole structures of their societies are different, and sometimes when the differences appear slight they are all the more subtle and deep, and therefore more important. The very ways of thinking and communicating, not just the subject matter, are varied. Some peoples rely on pictures and the eye, and do not comprehend what they hear, while others grasp well the spoken message, but do not understand what they see. These are differences due to their cultural experience, not to innate abilities or weaknesses—but they pose problems of reaching certain peoples in certain ways, or of giving them special training to make them reachable by other ways.

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\* Throughout this report, "locally" is used to mean within the host country and, unless the context clearly indicates otherwise, it refers to USOM activities or personnel in that country, working in conjunction with host-government officials or appropriate private sector leaders.

Loss of "face" is widely advertised among the problems; but how is one to judge its form or effect in advance, when in many lands a person who has failed of graduation from school will proudly show "A.B., failed," as indicating at least the honor of attending school long enough to have failed in his final examinations? Or how is one to know that advertising is not used in some countries because it implies that a man must be in dire straits, and needs business very badly, to resort to such a device?

How are any reactions to be foretold, even in technological matters, when dock workers can be given an actual demonstration of an improved method of loading materials only to have them say flatly that it cannot be done that way, immediately after they have seen it done easily?

These are not stupid people; they simply lack technological understanding, and that is exactly why the technical aids program is necessary, on their level. But how are they to be taken from one cultural context to another one which will support the technological development their countries seek? As one USOM Industry Officer put it: "You can't make a man feel that what his father taught him has suddenly become worthless."

One of the most important facets of a given cultural pattern is its internal structure, the ways by which its stresses and strains are held in balance, and the way dynamic trends are harnessed or channeled--all of which become important when something is introduced which affects that balance and changes the pattern. It is difficult enough to know this for one's own culture, even if it is an open culture, relatively easy to study. But in an underdeveloped area, no one at all may suspect what will happen when the existing situation is changed. A seemingly insignificant deviation can set off a chain reaction of formidable consequences, good or bad. The World Federation for Mental Health manual, "Cultural Patterns and Technical Change,"\* makes this point very clear, and it must be taken into conscious account.

The cultural differences are not even something that can be met on an individual country basis. There are many nations in the underdeveloped areas which each have more internal cultural differences, including more different languages, than all of Europe combined.

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\* Margaret Mead (ed.), 1953; the volume is part of the Unesco "Tensions and Technology Series."

### The Attitudes of the Peoples

While "culture," broadly or anthropologically speaking, covers the whole range of barriers and needs, there are nevertheless specific problems which can be better met by regarding them as separate matters. One of these is the matter of attitudes. Most Americans, perhaps, think change is in itself a good thing, because of their faith in progress.

The technical assistance program itself rests on such an assumption, but the fact that ICA has a Mission in a given country does not prove that the people of that country feel the same way. The general public does not necessarily agree—or at least it will agree only when it has been shown that a specific change brings a specific and usually highly tangible gain. A people who have endured without change from time immemorial, so far as they know in the absence of formal history, have confidence that they can survive by continuing to do what they have done in the past, but they have no such assurance about what a stranger recommends. The only strangers they have known in the past were people who took things from them; why should they not be suspicious of any stranger, and particularly one who is white-skinned like the men who were for generations their colonial masters, and who incomprehensibly says he wants to give them something?

Among the most important specific attitudes—and one which appears quite general—is the feeling for nationalism. It is not just a political issue; its implications for a program of technological development are direct, because it introduces a heavily charged psychological factor into decisions which should be made on the basis of hard-headed economics or technical know-how. Thus, nationalism often makes governments want to build big, ostentatious factories instead of the complex of small plants that will better serve; it makes them want self-sufficiency instead of realistically profiting from certain natural advantages in the interdependent world economy. Often it makes them resent even technical assistance as implying that their own lack of such knowledge and skills classes them as inferior, and often it makes them assume—in the heady first taste of independence—that they know more than old hands about almost any subject. Even a technical aids program has to take the nationalistic attitude into account; but if the matter is properly understood and met, it is often an advantage, because nationalism indicates a dynamic energy that can mean great benefit for a country if only its leaders can properly harness or manage it.

Still another category of attitudes is based upon natural and cultural conditions. In lands with overpopulation and very little material goods, there is a "material-saving" approach to problems, as opposed to

the "labor-saving" attitude in America. This is deep-rooted in realism, and is a major factor in any developmental planning or activities. In lands where subsistence depends upon the closest attention to every square inch of soil, an affinity between man and earth can be so animistic that plows, much less bulldozers, are abhorred because they cut cruelly into the face of Mother Earth. And where rust, rot, and decay are accepted as inevitable natural processes, maintenance is hard to sell as a worthwhile idea, and machinery quickly falls into wasteful disuse--even in a land which is "material-saving" rather than "labor-saving" in its general outlook.

Factors like these breed many misunderstandings and defensive attitudes and reactions, difficult to predict and to cope with. Yet, unless ICA policy is to say flatly that there is to be no concern for anyone who does not fully desire technical assistance, and will adopt it without any reservation, the dominant attitudes of the people will have important bearing on a technical aids program.

#### Language

Even if it were only a matter of a host country's having a language different from English, the problem would be substantial. Interpreters garble and distort, sometimes deliberately; translations often are weaker or more blunt than the original statements; the delays in communicating through an interpreter or waiting for a written translation are frustrating. Even when the hosts can speak English, it is often far from satisfactory. Words do not seem to mean the same thing; the idiom is different; the subtle intonations that mean as much as the words themselves are lost; straining to comprehend through unusual accents and vocabularies, both sides miss the large sense in the process of getting the literal sense; and as a compounded result, a grievous natural tendency in communication is aggravated: we all tend to hear what we want to hear, and we misunderstand almost in direct proportion to our prior conceptions and feelings.

There are further complications to the language problem. Instead of one national language, many countries have 50 or more dialects, and in the interest of nationalism they are imposing one (or several) of these as the national language. Thus the people often are themselves speaking a language not their own. In terms of the technological problem, the matter is even worse because these "new" national languages do not include standardized words for such things as simple tools (one national language is still trying to settle on one word for "wrench" among seven words now being used by different groups) and no vocabulary at all

for the really technical processes and materials of industry, much less science. Add to that the fact that many languages are not written, while in many other cases the written and spoken languages differ and there is no wonder that the work assignment for this study spoke of language "barriers." Arabic, for instance, has variations in different countries that break it up into virtually different spoken and written languages, although a "newspaper Arabic" is now being developed to serve interchangeably for simple writing. As a result, it may be possible to print elementary pamphlets for general Arabic-reading peoples even though it is not possible for them to understand the soundtrack of a film from one Arab country to another. Such a situation, multiplied worldwide, renders it impossible for the Technical Aids Branch to produce materials in Washington for general overseas use.

Nor is that the end of it: communication is more than formal language. It includes gestures, symbols, inflections, drawings, even puppets. Any technological message which is really intended for the "general public" has first and somehow to be translated through one or more of these "languages" to be fully meaningful. But because these too are generally traditional forms of communication, they often lack the means to express the new concepts.

### Education

Literacy, of course, is a rough index of at least simple education. It is well known that the percentage of people who can read and write in the underdeveloped countries is very low, although there are relatively wide variations and an encouraging increase in literacy. But even so, figures showing recent improvement may be misleading for the purpose of technical communication in the immediate situation, because the new literates often are mostly school children profiting from expanded educational programs, and their literacy will not be of great practical significance in the industrial picture for some years.

On some levels, and for some aspects of industrialization, low literacy may or may not be too much of a disadvantage; a country with a low rate may nevertheless have a highly educated upper class with owners, managers, and engineers who speak excellent English. On the vocational level and in elementary school education (if the problem is to train workers for modern industrial machines), the situation may range from areas where more students are being turned out on better equipment than they can hope to use, to other areas which are woefully behind the demand for even rudimentary tools.

Certainly, despite an emphasis on education in the USOMs and host governments, lack of education is a substantial problem in the way of proper or efficient use of technical industrial aids.

#### Needs of the Industrial Complex

The industrial problems of the underdeveloped areas, of course, have a direct bearing on a technical aids program. If there are gaps in technical knowledge in specific fields which a given country is planning to develop, there is prima facie need for materials to fill the gaps. All that can be reported meaningfully in short space is that there is a tremendous range in existing knowledge, all the way from competent operation of huge hydroelectric plants down to bare ability to use the simplest modern hand tools, but that in balance there is far from enough general technical knowledge to get a technological economy started much less operating efficiently.

In most underdeveloped countries there is a general absence of the technical orientation and skill which may be considered the "technological environment" necessary for such a development. There is a general scarcity of trained personnel at the various levels, from entrepreneurial through management, technician, supervisory, skilled and semiskilled worker, and advisers and trainers at all these levels. There is a lack of facilities for production, or for constructing the productive facilities; often there is the lack of engineering know-how even to know what is needed. By and large, the whole "private sector" complex--private enterprise and its organizations--is virtually missing; and as will be made clear later, this lack is but part of the weakness of the "communication complex" in most countries.

These conditions vary from one country to another, and even from one part of a country to another. Nor is there an easy yardstick to apply. If someone asks, "What are the levels of skills?", one must ask, "For what purpose?", since some skills can be adapted to new purposes and some cannot; and even if the purpose is known, one must ask, "Under what conditions?"

#### Host-Government Factors

There is probably a fairly direct correlation between the general educational and technological levels in underdeveloped countries and the efficiency of their governments as judged by American standards. That is to say, there are serious governmental deficiencies; and while

this is primarily a problem for the Public Administration specialists in ICA, under the existing set-up, it nevertheless has direct bearing on the kind of industrial technical aids program which can be undertaken, and upon the whole program of technological development. At the one end of the range of governmental deficiencies is the matter of "face": some officials believe asking for aid is an admission of their own weakness, and thus they do not use ICA potentialities properly. At the other end, in many countries there is a maze of government regulations working at cross purposes, frustrating development efforts.

In varying ways and in varying degrees again, the following are among the notable governmental "barriers" to development: (a) laws in conflict and seeking opposite objectives; (b) taxes ostensibly for revenue but really losing revenue because of their adverse effect upon business development; (c) red tape, sometimes almost hopeless in its tangle, for no apparent reason except that it is an accumulation of the ways things have always been done, or because of inexperience in newly independent nations, or because it provides more government jobs; (d) licensing, which allows arbitrary controls on new activities and contributes to red tape; (e) inefficiencies—delay and inaccuracies—on the part of governmental staffs, due to many factors, including lack of understanding of what public service means, lack of communication know-how, and lack of organization generally; (f) political factors, with governments yielding to popular pressures out of expediency rather than standing on principle, due perhaps to lack of confidence in their administrative abilities; (g) political influence, negating the whole system of orderly government on behalf of special interests; and (h) so the team was often told, graft.

Many of these conditions have a direct bearing on a technical aids program. Six months were required in order to get an urgently needed mobile audiovisual unit through customs in Greece, even though no customs duties were involved. In Indonesia, especially, the mere movement of aid materials off the docks seems an almost insurmountable bottleneck, although again these materials are considered by all concerned to be urgently needed. The dollar-exchange problem, of course, contributes to the difficulty, because regulations are required to control dollar expenditures. Yet too often the regulations prevent purchases of trivial materials and supplies which hold up major programs. In combination with ordinary tariff operations, these import controls often hamper the flow of educational supplies, informational materials, and technical aids as such. Unesco calls these "trade barriers to knowledge," and there can be no doubt that a real problem exists.

#### D. ICA's Role in Motivation

The extent to which ICA should motivate host governments and the people of underdeveloped areas to use technical aids materials is, of course, a policy question related to the broader policy question already stated: How far should ICA go in stimulating interest in technological development (e.g., should ICA wait for expressed needs)? In any case, motivation is not something which can be eliminated from other functions: an instruction pamphlet, no matter how strictly conceived to adhere to facts and to refrain from urging a certain kind of action, must nevertheless be designed to make its point as clear as possible, to attract the reader, and otherwise to do all possible to insure the most efficient use of the pamphlet itself. That is only common sense, to insure best use of funds--but it is also one level of motivation.

This study has been conducted with the assumption that motivation is a part of ICA's responsibility. This in no way implies that ICA should force a program contrary to the policies or desires of a host government, but in the general sense used in this report, "motivating" does mean using proper communication and psychological techniques to get individuals to take part in the technological development program of their country and use technical information effectively.

The emphasis in the foregoing sentence is on the word "individuals." The government of an underdeveloped country may be completely committed to bold and urgent technological expansion, and the people have a dynamic surge of nationalism and freedom which impels them to improve their lot. But when the case becomes one of the reaction of the individual to a suggestion that he, personally, change his age-old habits or techniques, or enter into some new productive venture, he has to be given a strong impetus to take that particular step. He has to be motivated. The people have to be encouraged--almost personally, one by one--to improve their skills, their factories, their organizations. If this fact can be recognized, technical information personnel will be able to handle the motivation problem as part of their job, without feeling reticent about trying to convince host-government officials or private individuals that a proposal is in the host-country's interest. It might be said that as the United States Information Agency helps prepare the climate of democracy, so ICA should help prepare the climate of technology, because building an interest in technology is part of the development problem.

Motivation is important to the technical aids program for the following reasons:

1. There is no point in issuing technical information if it is not going to be used, but one reason that it might not be used is that the people of the underdeveloped areas often do not have confidence enough in the information to use it. Lack of "motivation" may well be due to the different cultural values, the different levels of experience and reality by which to judge the suggested changes. Why should they leave their security—poor as it may be—to go forward in the dark unless they know their adviser can lead them safely? Thus, technical advice which requires changes (and even a minor improvement in American terms is often a major change in these circumstances) must be produced and disseminated in such a way as to give confidence to the potential user.

2. Similarly, it is not sufficient simply to explain Western concepts such as maintenance, cost accounting, and human relations or other management skills. The people must be sold on using them (always with the agreement of the host government) because they do not now fully appreciate the value of such techniques. Actually, the motivation may be more important than the explanation, because once he is really "sold," a person often will find some way to get the specific information he needs.

3. One major and specific problem lies in changing age-old resentment-frustration patterns among these people into positive patterns, among which might well be the healthful kind of dissatisfaction which makes people do something to improve their lot. Obviously a long-standing negative pattern is not going to change itself, nor be changed simply by the availability of explanatory technical materials. Before these materials can be properly used, a process of growth and development is required, involving fairly fundamental changes in outlook and behavior.

4. Motivation of those seeking technical information must be understood, or it will be impossible to find the right materials for them. A plant manager may ask for one bit of advice when he really is groping for a full-fledged appraisal of a major problem, without his even realizing it. When a manufacturer asks the speed at which a 10-year-old boy should be able to turn a heavy flywheel by hand, to make his machinery go, perhaps the manufacturer really needs advice on getting diesel or electric power.

5. There is a real problem of follow-through in the underdeveloped areas. Some times host-government officials and private users seem to understand and even approve of the information they have been given, but then nothing happens; they do nothing to follow-through on the information. Despite all appearances, clearly they have not been really motivated, which is to say they do not really believe what they have been

told. There is "passive acceptance" of new ideas often enough, but it leads simply to "passive rejection" later.

6. There is a measure of self-education involved in the transmission of any knowledge. The recipient must, by his own processes, assimilate the information and make it part of himself, so he can use it. Therefore, technical aids materials must have enough built-in motivation to tell the recipient what to do next.

7. Sometimes a specific group must be motivated to do a particular task to help a larger group achieve a broader program which is already an "expressed need." For instance, almost any village anywhere would be willing to convert its water well to a mechanical pump, but only if it could be certain that there would be no breakdown of the pump. If blacksmiths can be taught to fix such pumps, and the village can be assured of its water supply, then the program of improving water wells can go forward. But things being what they are, the initiative for the blacksmith to learn in advance how to fix pumps will not come from within the village.

8. In "cold-war terms," as the Stanford Research Institute team was often told, "If ICA doesn't help the host government sell the people on this, watch out for who will sell them something else," meaning, obviously, the communists. There is a more positive approach: increasing the interest in technological development diminishes interest in nihilistic revolution, for a mind occupied with constructive efforts is not likely to be receptive to communist talk. The positive revolution of technological improvement has more to offer than word promises.

9. The person who doesn't read is no better off than the one who can't read, and giving him materials is just as wasteful as giving materials to a person who cannot read.

Even the basic approach which ICA adopts for its whole program—namely, teaching the people to help themselves, developing dynamic democracy, looking to long-term gains, "seeding" for further developments—may be a block to effective action, because of these motivational aspects. To tell these people that the United States is going to help change their attitudes does not in itself give us rapport with them; we must do things that to them are obviously in their immediate best self-interest. Our stated and practical purpose must be to help them get the specific, urgent local job done. If we can also manage to do it in a way which serves the purpose of long-term training, so much the better; but in a technological training program (as distinct from an educational program in schools, where the long-term purpose is recognized) the motivational

factor must be in terms the host people can understand, not in terms of what U. S. advisers think "ought" to be done.

In view of the foregoing analysis of the problems facing ICA, it is concluded that technical assistance must be, to a judicious degree, "merchandised" to the underdeveloped countries. Once a government is committed to economic development, the people must be encouraged to take each of the various difficult steps that lead to it. With specific reference to technical aids, the people not only must be exposed to technical information but must be encouraged to use it. Such an operation requires proper choice and use by ICA of three major elements:

1. Subject-matter--the information itself.
2. Motivation to want and use the information.
3. The processes and facilities for carrying the subject-matter and the motivation to the potential users--for communicating information--and for making possible their action as a result.

It should not be assumed that the "merchandising" techniques which have proved useful for the American public can be applied in the underdeveloped areas, or even that we can motivate the peoples of those areas in terms of our own value system. The three elements listed above must be applied wisely on the basis of expert knowledge of the existing attitudes and cultural patterns of the host country.

Because motivation is largely to be approached by communication techniques, the third element--communication processes and facilities--assumes particular importance in the underdeveloped areas even though it is often taken for granted in the more industrialized countries.

#### E. The Communication Approach in ICA

It is at this point that the concept of "the communication approach" emerges. When the purposes, policies, and operating framework of ICA are seen in context with the complicated cultural, political, psychological, ethnic, and techno-economic factors affecting technical assistance programs

in underdeveloped countries, the dynamic ingredient called "motivation" becomes part of the larger ICA process and problem of communication.\*

Technical assistance is essentially a communication activity, and ICA a communication agency in its technical assistance operations. Although there are some exceptions, this concept does not seem to be generally recognized within ICA, nor generally reflected in its methods of operation. Once the concept is adopted, however, it provides the basic orientation for the technical aids services, and a dynamic and unifying rationale for many activities which now seem divided in purpose.

ICA's understanding of the central importance of communication lies everywhere below the surface, and manifests itself in numerous specific activities. ICA technical assistance programs stress technicians and consultant specialists, and their obvious employment is to communicate their know-how to the underdeveloped areas. But the conscious awareness of how this, too, is part of the total process seems to be generally lacking.

This is by no means unusual or blameworthy; communication is simply assumed too easily, as is the air we breathe, and its full implications are hardly understood by any of us. Books dealing directly with the subject of technological development continue to appear without the word "communications" (much less "communication") showing in the index, and even when it does appear, there is seldom a spelled-out understanding of its implications. A report to ICA, this year, specifically explored the elements of a necessary supporting base for manufacturing development without mentioning communications anywhere, although literacy, transportation facilities, and electric power were listed among the requisite elements.

Supporting the purposes and ideas of men, the integrative factor in a society is its "communication complex," as it is called in this report; the relationship may be considered roughly analogous to the "mind" of man in relation to his brain and nervous system. In terms of the whole problem of technological development, this "complex" is an important aspect of communication, and it is therefore discussed immediately following, with other implications to ICA resulting from "the communication approach."

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\* In this report, the word "communication" is in general distinguished from its ordinary plural usage, in the sense of communications media or communications facilities. "Communication" encompasses all aspects of the process of communicating, in its broadest sense, including media and facilities.

It should be noted, however, that this report is by no means a treatment of all of the major implications of the communication approach. By the nature of the Work Assignment, this report is generally limited to the technical information part of the problem, and even more specifically to technical aids--as distinct from other such broad areas as sending subject-matter specialists abroad to undertake particular projects, and bringing "participants" from host countries to study and observe in the U. S. Since technical information must be conveyed and used by people, the information media or technical aids actually are auxiliary; for that reason, care is taken to indicate the service role of technical information activities as much as possible without becoming repetitious.

### The Communication Process

It may be helpful to look at the communication process itself first, in the context of the problem of reaching people in the underdeveloped areas to provide them technical information. There are three separate elements involved in any communication process--origin, transmission, and reception--plus the special environments of each separately and the common environment of all (even if the sender and receiver have nothing more in common than the contact which the transmission facility provides, as may well be the case in underdeveloped areas). The following list of obstacles to getting a message (e.g., information) exactly as intended by the originator is not exhaustive, and does not appear in order of importance, inasmuch as varying surrounding conditions affect the relative importance of the items. But the list does present a useful way of looking at such problems as cultural differences, in terms of how someone is going to utilize the technical aids furnished by ICA/W. It therefore has a direct bearing on how the Technical Aids Branch should prepare its material, and the specific recommendations later in this report are intended to meet the various difficulties listed here. Furthermore, while it is presented at this point to make clear just how complex the problem is, the list will also serve as a check list of obstacles to be overcome when producing technical aids. While not all of the following difficulties apply in every case, obviously, enough of them usually are present to make even simple communication of technical information an uncertain undertaking.

The Difficulties of the Originator Himself (e.g., the Technical Aids Branch or, in a Local Situation, the USOM Industry Officer)

1. It is hard for the originator to determine exactly who the audience should be. He lacks knowledge about needs, desires, and attitudes of the people of underdeveloped areas, and generalized information is difficult to apply in specific cases.
2. It is even more difficult to know what to send; the receiver is just one of the factors in the decision.
3. Political or other extraneous considerations may affect the message (e.g., the whole question of expediency vs true long-range benefit).
4. The problems of transmission and reception must be taken into account. There is no sense in speaking a radio message into a microphone if the transmitter is broken or if the intended audience does not have access to a radio receiver. Often the originator has no real way of knowing or understanding the extent of these other problems.
5. Often the subject matter for the message simply is not available to the originator, as, for instance, when a desired process has not yet been developed, or (perhaps more often) is not known to the sender. All too often, the available information is not adequate.
6. Even more frequently, the information is available, but at a distant point, and expense and delay are involved in getting it.
7. Often there is question—and no real way to determine—whether the desired information is really worth the time and effort to get and to transmit.
8. All the problems which affect the originator in conveying information to the "consumer" come into play when the originator initiates another communication action to obtain the information he needs to transmit; he will in turn be a receiver when the information comes to him for relay.
9. The originator may have his own internal problems--lack of trained personnel, or at least a high turnover; inadequate research and analysis facilities; problems of policy, and especially unpredictable shifts in policy beyond his control; frustrations and new problems created by frustrations; red tape and other complications of internal communication.

The Difficulties of Transmitting (e.g., at the USOM or Host-Government Level, Where There are Go-betweens to Reach the Ultimate "User")

1. The transmitter is subject to the same problems as both the originator and the ultimate receiver: he is not necessarily an automatic relay.
2. The greater the number of channels through which the message must pass, the greater the delay, the distortion, the chance for gaps or complete breakoffs.
3. The difficulties of language are prodigious, even in understanding someone else exactly in a common language; they are much worse in translating from one language to another, especially when one of the languages does not have technical equivalents or parallel concepts. Sometimes information simply is not transmittable to the desired recipient, because the words do not exist.
4. There is resistance from communicators themselves, because of conflicting interests, prejudices, or suspicions. Anyone in any of the links in the communication chain may consciously or unconsciously resist a message which undermines his authority. This is complicated by restrictions imposed by supervisors or employers, in addition to those of the communicator himself. (It is not that the superiors' limitations are imposed instead; what happens is that both sets of limitations are applied.)
5. Some communicators may try to divert the message to other purposes (e.g., a Ministry of Industry may hold up giving information to a private source because it can use the information itself to further a Ministry project).
6. There is competition from other messages for the communicator's time and facilities which may delay or even lose the message entirely.
7. Some languages create their own transmission problems, as for instance a language which requires 400 different characters in printing type vs a minimum of perhaps 45 for English.
8. Often there is simply an absence of communications equipment, or proper administrative arrangements to make channels available.
9. There is a lack of coordination, so that messages may not be received in proper order.

10. Information is often a perishable commodity, but cannot be handled as such because of red tape, inadequate staffs, etc.

11. A motivating concept of service may be lacking in communicators. Often a message is merely a chore, or a chance for graft.

12. There is actual danger in unexpected reactions when a message is garbled.

#### The Difficulties of the Receiver in Getting the Information

1. He does not have the money (or at least foreign exchange) to buy the book or film, etc., which contains the information.

2. He does not have motivation to spend money for, or even ask for a free copy of, something he does not understand will be useful to him.

3. Prejudices, suspicions, traditions, and cultural patterns limit his general receptivity.

4. He lacks the necessary education--in literacy, or the requisite foreign tongue, or technological skill--to understand the information fully.

5. Being ignorant of the general context of a technological society, he is therefore incapable of judging where this communication fits in, and how well: he has no way of evaluating it.

6. He rejects the source as not authoritative because it is not the kind of source he has been taught to respect, e.g., a young expert, when he has been taught to revere only elders.

7. He is hampered by law--customs regulations and other trade barriers, as well as censorship on occasion--from getting the information.

8. He is hampered by financial policies of his government, which may keep a specific kind of information from him as leading to undesirable developments (from the government's point of view).

9. Chronic unhealthy conditions prevalent in many underdeveloped countries may deprive the receiver of strength and vigor to get the information and study it, much less implement it.

10. His place in the social structure—e.g., caste—deprives him of the opportunity to get the information.

11. His feeling of "face" keeps him from asking questions, as betraying ignorance or taking the risk of being laughed at.

12. He ties the technological message in with political factors (e.g., sees all U. S. aid as only "cold-war" material) and rejects it, particularly if the message suggests political overtones by the way it displays such emblems as the ICA shield.

13. The information is often so seemingly nonapplicable that he misses the value it does have for him (e.g., material on insulation for cold climates may not seem applicable for hot).

14. His own general viewpoint and purposes give the information a low priority for consideration (e.g., he puts a pamphlet aside to read "later").

15. His conditions have changed since the origination of a message intended for him, so it is no longer applicable (e.g., he wanted to know how to build a certain kind of plant; by the time the answer comes, a competitor has already built one, and he has lost interest).

16. Because he has no framework of knowledge adequate to let him properly understand the information, often the information is not sufficiently helpful (e.g., while he is trying to understand the complexities of designing a factory building, he is given the costs of building a plant in dollars which he cannot figure how to convert).

17. He garbles the message due to the practically universal tendency to hear something the way one wants to hear it.

18. He cannot get supporting data and materials as required, so he is not interested (a bibliography refers him for details to books he cannot buy).

19. The pace of comprehension required is different (as in a film), so he cannot comprehend.

20. A novelty in the communication (e.g., a strange sight in a film, or a peculiar drawing in a book, or a puzzling word) distracts his attention from the principal point, so he misses it.

21. A potentially "perfect" receiver (e.g., one who understands English and has the context to understand the message) is missed because the message tries to reach too wide an audience (e.g., "the average man") and is consequently watered down too much.

22. Receivers who depend primarily upon one of the senses are given information via media requiring another sense (e.g., some groups are "eye-oriented," so that they understand well what they see, but not what they hear).

23. Some people have been accustomed to learning in one way and cannot absorb material brought to them in another (e.g., a school situation vs a specialist working with a man personally).

24. There is friction in cutting across established procedures, which creates, in effect, a "static" against receiving the communication itself.

Obviously, communicating technical information to the underdeveloped areas is not as simple a matter as printing a pamphlet and shipping it out. In fact, if that is all that is done, the value or wisdom of the entire operation is seriously in question. However, it should be observed that the Technical Aids Branch itself is aware of the complexity.\*

The general conclusion which almost inevitably results from the above analysis is that the local factors affecting the way a message is received, and how it is acted upon, are so controlling that an ICA communication program can succeed only if it is constructed to let these factors be fully operative. At some point, the ICA program must mesh with local practice and convert into local terms, by helping the host-country people make the program their own, and letting them assume the chief responsibility for carrying it out in their own way. In practical terms, the ICA technical assistance program can only work through the host country's "communication complex," even if "working through" the complex means helping to adapt it and expand it to the needs of technological development.

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\* c.f., The table in "Inter-related factors contributing to national levels of productivity," in the pamphlet, "Productivity, Key to Plenty," recently adapted by the Branch from a 1953 article by George E. Sadler.

### What a Communication Complex Is

In simple terms, a communication complex in a given area is its entire existing pattern and practice of human communication, including everything from the traditions which control such matters as who speaks first to whom, to the language itself, to the equipment of communication in the broadest sense (roads, waterways, printing plants, television transmitters), to the organizational pattern that determines subject matter and controls opinion. A country such as the United States, with a multiplicity of mass media (newspapers, radio, television, magazines, books, etc.) plus vast telecommunications and transportation networks, free-speech tradition, and an elaborate educational system, has a highly developed communication complex. An underdeveloped country, with few roads, an inadequate telephone system, no effective mail service, few radios, no daily newspapers, and a tradition for keeping trade secrets and one's own counsel generally, has a poor communication complex.

This is not to say simply "the more communications the better." It is rather that a certain level must be reached in the communication complex to sustain a given level of technology, and the communication complex for that level must precede the technological advance itself.

For instance, rudimentary roads are needed for even a semblance of a true government or a marketing system; high-speed roads and/or good airfields are needed for highly industrialized economies. If there is not even mail service to villages, the inhabitants can hardly experience even the beginnings of a sense of being part of a larger interdependent whole, which is a foundation of technological advance. If the telephone system is not operating properly, and it takes one office a day to contact another in the same city, time and energy are used in frustration and revising plans due to delay, and in going back and forth in the hope of finding the other person in for a conference. The whole of any project or activity, from dreams, to plans, to construction, to operation, to integration with the community—on whatever level—requires first a level of communication efficient to the point of diminishing returns, and perhaps even somewhat beyond that point, because communications facilities in an expanding economy seem to give rise to new uses faster than the system can be built up.

The SRI research team found little active recognition of such a concept (although there were many specific projects devoted to partial fulfillment of it—transportation projects, audiovisual centers, education systems, etc.). But, just as strikingly, the team members found that when they proposed such a concept as a working principle in an underdeveloped country it was almost unanimously accepted, and indeed very

often an effort was made to demonstrate that it was already a conscious operating principle.

The conclusion appears to be that if ICA is a communication agency in terms of technological development, and if the development of the communication complex is not only an integral part but the first-priority part of this technological development, then ICA should be geared in a conscious, dynamic, and integrated fashion to give the technical (and perhaps economic) assistance necessary to discharge this function.

#### Elements in a Communication Complex

The following list of elements in a communication complex is not necessarily complete nor in order of relative importance, but it does show the areas of activity under discussion. The elements are:

1. Telecommunications
2. Postal system
3. Printing facilities
4. Mass media: newspapers, magazines, radio, television, books, pamphlets, billboards, and wall newspapers
5. Transportation
6. Power transmission and pipelines
7. Education
8. Government (the communication of authority, of public policy, perhaps of technical information)
9. Other organizations (sometimes to insure that government does not have a monopoly on communications)
10. Advertising
11. Financial complex per se--money, banking, credit
12. The mores and attitudes governing behavior and thus communication (e.g., purdah obviously affects communication for the woman concerned; secrecy or gregariousness as a cultural pattern has an even broader effect)

13. Trade and marketing facilities
14. Photography
15. Availability of communication "tools"--pens, pencils, slates, blackboards, personal cameras, phonographs, radios, etc.
16. Libraries
17. Information centers
18. Research organizations
19. Channels of access to new sources of information and to outside information
20. A common language
21. Versatility in additional languages
22. The basic communication pattern (whether by ear as against eye, etc.)
23. Amenability to change (Unless there is ability to change in a country, it is of no value to receive know-how, because a person will be frustrated in trying to use it and to make gains for himself. Hence, he will soon give up trying to get it, thus cutting off a channel of communication as effectively as a listener shuts off a radio set because all he gets is static.)
24. The level of the concepts of service, cooperation, and the other elements of a true democratic society (lack of desire to serve is equivalent to a faulty connection in a telephone)
25. The level of the art of editing, or selectivity and synthesis (In almost any communication, there is an element of selectivity and synthesis--the receiver decides what part of the message to believe or act upon, and how to fit it into his existing knowledge or action pattern. Messages get through efficiently, and achieve their purpose, to the extent that the editing process is appropriate.)

The communication complex can include any or all of these ways of communicating:

1. Presenting information as a public service or as a commercial venture, as the press presents news, for instance, or a library presents reference facts.
2. Promotion--to sell attitudes, actions, or goods.
3. Instruction, education--to develop a framework for later and presumably more specific communications.
4. Entertainment.

In working with underdeveloped areas, it is possible, of course, to discern all of these types of communication. Each type involves somewhat different orientation, structure, subject matter, and kinds of recipients. It is therefore pertinent to examine which of these activities are part of the function of ICA, and specifically of the Technical Aids Branch.

The first kind of communication, presenting information, clearly is pertinent. The second one, promotion, might appear not to be; indeed a case could be made out that if both ICA and USIA are communication agencies, they differ (aside from subject matter) in that ICA's purpose is "factual" whereas USIA is "promotional." However, the distinction does not hold in every case: the USIS libraries are a conspicuous example of the "factual" approach, even recognizing selectivity among the titles on the shelves in certain subjects. Conversely, to the extent that ICA has motivational responsibilities, it is in the "promotional" field.

The instruction or education category is clearly a function of ICA, but it is perhaps moot whether the Technical Aids Branch should be in the field, when the Education Division has a clear responsibility. Obviously, the activities of the two units overlap, and the practical question is, "How far should Technical Aids go into training, and how can it coordinate with the Education Division--and also with Agriculture, Public Health, Labor, and all the other activities which are 'educational' at least in some respects?"

The team found no suggestion that entertainment is any part of ICA's function, although there is some recognition that the entertainment value of films has some relationship to the training value, and that an entertainment industry provides a base for an educational or technical film industry in a country.

Entertainment aside, there is considerable overlap among agencies in the various types of communications functions. It does not necessarily follow that this is an evil. In the underdeveloped areas, where often a great deal of help is needed, it may under certain circumstances be doubly useful. However, it is clear that this overlap, as well as the other complications of the communication problem in underdeveloped areas, should be seen whole and dealt with whole, by some person or persons, at some point, in the interest of orderly and efficient technological development. Not only will it be useful to top planning boards and USOM officials to see projects in context, but it will be helpful to all the workers in communication projects to appreciate their relationships and thus perhaps work more closely together.

#### Reasons for Developing the Communication Complex

The operational advantages are not the primary reasons for developing the communication complex of any given area. The following are even more fundamental:

1. While there may not be total agreement by experts, there is at least some truth to the observation that the West's industrial revolution came only because there was a communications revolution which made it possible. There is reason to believe, as already indicated, that the East's industrial revolution will come in the same way. The communication complex is the nervous system of the social organism; and it would seem as true here as in biology, that only as a social organism can develop an advanced nervous system can the organism advance to more complex forms. Civilization itself has formed along the communications routes, and has expanded as the means of communication improved.

2. The internal function of communication, in the large, is to integrate the parts of an organism to work together. This is, of course, a prime requisite of a technological society, which becomes so specialized and thus interdependent in its parts that a change in one segment (e.g., a strike in just one phase of one industry) can upset the balance and affect all the other parts. Integration is, in fact, necessary in any organism or institution which has to achieve any degree of efficiency for survival; it is thus of prime importance, too, to the underdeveloped areas of the world as they face their problems of population and political independence. If ICA is to help them become integrated societies, it must help develop the communication complex which makes this possible. To touch upon just one pertinent phase: only as people can know each other's problems, abilities, resources, and attitudes can they find the mutuality of interests (e.g., a business deal, or pooling of resources) which leads

to the specialization or division of labor that makes possible technological progress. And they can find all these things out only through the communication complex.

3. The more diversified and comprehensive the communication complex, the more democratic the society is likely to be. This is not to say simply the "greatest quantity" of communications facilities, since this may be--and has been--a device of authoritarian governments such as communist Russia and nazi Germany. A sense of mutual interest and a pluralism of organizations are essential to democracy; the communication complex is, in turn, essential to their development. Coming out of colonial status, as many of the underdeveloped areas are, these countries usually do not have fully developed communication system. To strengthen their democratic institutions, the development of the communication complex is a primary step.

ICA often finds itself in a quandary of expediency vs principle, helping build a strong central government to meet immediate needs, at the risk of undermining the very democratic concepts for which the whole effort is undertaken. The building of a government-controlled communication system involves such a risk directly; the development of the communication complex is a saving antidote. This is because the communication complex builds strength in the social body to withstand any unwholesome power that may develop in the government, in at least two ways: (1) it provides a greater channel for "feedback"--i.e., the "voice of the people" or public opinion--to guide and warn the government against excesses, and (2) it allows the freer flow of information and ideas to combat misrepresentation, rumor, suspicion, and the usurping of power which distortion of fact makes possible. These are fundamental premises of democracy, as the United States uses the term, and the importance of free flow of communication is recognized by the guarantees of freedom of speech, press, peaceable assembly, and petition in the United States Constitution.

The implications of the point above almost certainly will arise in host countries as the communication-complex development is suggested--where it is not already clearly in mind as a result of projects to strengthen radio and other government communications facilities. There can always be differences of opinion about priorities, e.g., whether a radio station is more urgently needed than an effort to create a private association of manufacturers. But if a host government resists the very principle of developing the communication complex, as jeopardizing its control, then in terms of serving democratic objectives there can be serious doubt as to the wisdom of strengthening that government's own communications.

4. Not only in terms of government, but in all actions of a society an adequate communication complex comprises a built-in gyroscope to keep matters in balance. It is a two-way process--the relatively rapid spread of any new program to all who are sensitively interested, and then a comparable (and probably more immediate) reaction (or "feedback") where the program causes troubles. This action is a useful safeguard when millions of lives and the future of a nation are at stake, and it is the essence of the democratic process.

5. Lack of proper communications wastes human resources. Especially in countries bursting with new energy, demanding change, working for it, it is frustrating not to have modern communications. For host-country officials and private leaders and for USOM personnel alike, there are wastes of time and missed opportunities in delays and in the aggravations and the errors which they cause.

In the present situation, there is a very specific further point to the waste of human resources and frustration. The leadership of discontent--and thus of communism--breeds among the intellectuals. The SRI team was told that the ICA program is not in balance, having slighted the intelligentsia, and therefore often lacking their support. This observation proved difficult to confirm or deny. But there can be little doubt that as the communication complex expands, it affords greater interests especially to the intelligentsia, and greater chance to work more profitably in positive and creative activities, so that their preoccupation with negative measures diminishes.

6. An effective communication complex adapts the technological changes into the indigenous cultural fabric, whereas otherwise they must be forced upon the people. This is a most important service. The SRI team found at least some resistance to technological development, as adopting "American" culture at the expense of the indigenous culture. Resistance to technological change would be reduced if the people concerned made the changes out of their own understanding, and used their own abilities and ingenuity to adapt a technique to their own purposes, so that they might feel they were not supplanting their own values with an alien standard but were really improving their own. Given adequate communication, this can happen, and with relative speed; without it, the absorption rate is very slow.

7. A parallel action of the communication complex is its broad motivational effect. Motivation is very complex, varied, and personal; but no leader, and certainly no USOM official, can hope to take each person by the hand and motivate him properly. The communication complex reaches more and more people, as it becomes more effective, to spread out

ideas and facts--and the hope is that sooner or later the right combination of values and potentialities will reach the right man, and cause positive action on his part. This process taps new resources--the small, unknown men who would never be on anybody's list to be reached any other way, but who may well be the geniuses their country needs.

8. The success of motivation in achieving its goal is dependent upon two variables--the degree of reward and the degree of difficulty in attaining that reward. This concept is what Dr. Wilbur Schramm calls the "fraction of selection": the likelihood of adopting a new action can be increased either by making the promised reward more desirable (increasing the numerator of the fraction) or by making it easier to achieve (decreasing the denominator of the fraction). Either the value to be gained from technical information must be shown to be greater to the person than he might otherwise have thought, or the information must be made easier for him to obtain and understand. If it has little value and is hard to come by, he will not try to get it. Even though it may be of obviously great value, there is a point beyond which it becomes too much trouble to be worth it. A developing communication complex makes it increasingly easy to get and understand technical information; it is thus of the same kind of benefit as direct motivational effort. And one direct result is that the easier it is to communicate, the more communications is used--and thus it expands more and more, improving and becoming cheaper.

9. A well-functioning communication complex makes it more likely that any one person will get more of the great variety of pieces of information and attitudes which a technological society requires. There soon become too many specifics for a teacher or an extension agent to cover when he passes along his know-how; these gaps must be filled somehow and, unless they are, there is no forward development. The communication complex provides this supply of facts by building up the process of normal spreading of knowledge.

10. The learning process for almost any individual appears to be helped by receiving a message in various ways through different media, not alone by repetition in the same medium, especially is he helped by demonstrations and by example. By reaching the individual in many ways, the increased flow of technical information through a developing communication complex appreciably augments formal educational processes and helps build the general knowledge level of the public, a necessary support for a technological society.

11. Both of the previous points touch upon the importance of raising the general knowledge of the public. This is a necessary condition for a technologically developed nation because almost any person can cause great harm in his ignorance by such actions as cutting a power line, polluting a stream, starting a fire near combustibles, or wrecking a machine entrusted to him. A warning against fire--in many ways a trusted friend--would be incomprehensible to someone who had no understanding at all about the volatile nature of oil stored nearby. The message simply would not get through to him because he lacked what communication theory calls an overlapping frame of reference. He and the man trying to warn him would, in effect, be talking different languages because they did not share in common the experience of what can happen to oil when a flame is applied. The communication complex, properly expanded to facilitate the flow of technological information to the general public, makes possible a broad enough frame of reference for the people of a country to assimilate the new demands made upon them by continuing technological improvements. This same thing is seen in the United States, in the public's general understanding of science and its value.

12. The development of communications has a multiplying effect, often unpredictable. "Where roads go in," the SRI team was told, "the first result is the use of more fertilizer, because people start buying bicycles to go to town, and they pick up a sack of fertilizer to bring home."

13. There is a negative factor to be taken into account in maintaining an inadequate communication complex, and this is specifically applicable to the too-limited use or misuse of audiovisual materials and of technical aids in general. This misuse builds up disillusion, kills off interest, and wastes opportunities.

In presenting the foregoing reasons for increased emphasis on developing the communication complex, this report does not intend to suggest that such a program would be a panacea, nor even that the gains as described would be exclusively ascribable to such a development. The communication complex is nothing in itself--it needs the substance of people and ideas; the analogy of the nervous system still holds, in the sense that the body still acts by muscles, for all that the nervous system prompts them and coordinates them. There must still be all the substantive technical assistance programs. As a matter of fact, the point was frequently made to the SRI team, that economic or development assistance must accompany technical assistance, or the effort is often wasted. There must be money--credits of some kind--to do the things being talked about.

The point made here is that the numerous forms of communications can and should be considered consciously and in organized fashion as a development program, and can be seen as central to ICA's entire technical assistance function. If human communication can be a purposeful stimulus to human action but is now ineffectual in underdeveloped areas, a consciously planned and carefully undertaken program is required to achieve the potential benefits.

#### Kinds of Projects Involved in Improving the Communication Complex

To make clear exactly what is involved in a communication complex development program, it may be useful to list some of the numerous projects which properly would be the concern of an agency responsible for such a program within a country.

Under ICA's setup, each project would be undertaken by the division directly concerned with the subject matter, although a coordinating officer is recommended below, and it may also be worth considering establishing a "communications industries" section within the Office of Industrial Resources. Most of these projects also involve the private sector, and should be so oriented.

The list:

1. Strengthen the central government's own communications systems, which are generally weak. This incurs the obvious risks previously mentioned, but it is better to do it than not, because without a strong communications system authority certainly controls, whereas with it the free spark eventually will come. "Strengthening" involves a whole range of improvements from better administrative techniques through printing equipment.

2. Strengthen local (i.e., provincial, city, and even village) governments. These are themselves a communication channel for getting the people's will expressed in a way that is not swallowed up in the national mass, and a means of marshalling local efforts for local development.

3. Work to free private business channels from harmful governmental restrictions.

4. Develop and strengthen an indigenous communications industry, in private hands insofar as possible:

- a. A strong radio system and even television where the technology of the country can handle it (nearly always government controlled, and a dangerous weapon, but a great tool for pushing the development program in all its phases and bringing new ideas to the people).
- b. Strong newspapers, magazines, trade and professional journals (privately owned, as a counterbalance to the radio).
- c. The printing industry. The printed word is probably the basic communications medium even in an area of high illiteracy and even in an electronics age.
- d. An editing profession, through special training courses, to improve the quality and speed of communications media. A good editor can do much to insure that a message is properly received. A bad editor, of course, can himself cut down the efficiency of the message, by tampering with it.
- e. A book publishing industry, helping publishers as businessmen and manufacturers, and getting people to read.
- f. A film industry. This includes entertainment films, because they develop audiences which then are available for documentaries and training films, and because they support the technological advances and trained staffs which can produce the documentaries.
- g. Advertising, necessary to make possible the low prices for communications media which create, in turn, mass audiences--to say nothing of advertising's direct functions of spreading ideas, stimulating sales, and encouraging the circulation of money.
- h. Libraries, and the education of people to use libraries and reference materials generally.

5. Build the industries and facilities which support, maintain, and supply the communications industry:

- a. Telecommunications industries--telephone, telegraph, radio, and television transmission.

- b. Equipment manufacture—printing, electronics, photography, and especially inexpensive consumer equipment such as small radios.
  - c. Supplies manufacture—especially paper.
  - d. Transportation in all forms, including power transmission.
  - e. Mail service, including rural free delivery and some kind of rate preference like United States second class mail to encourage the distribution of mass communications media.
  - f. Equipment maintenance and repair.
6. Promote schools, community development programs, extension services, cooperatives, and similar organizations which are built around communication.
7. Promote media production centers, productivity centers, research centers, and other organizations which not only produce communication materials but act as disseminators of information.
8. Strengthen the institutions of the society by which persons reach each other and join in mutual action—i.e., private organizations of many kinds.
9. Specifically, develop trade and professional organizations, which can do extensive communication of technical information by their regular meetings and speeches, exhibits, mailings, periodicals, announcements, directories, and conventions.
10. Seek to eliminate customs duties on informational materials, licensing, foreign exchange restrictions, and other "trade barriers" to knowledge.
11. Promote literacy and language study—teaching people to read, to read more and better, to use reference materials, to facilitate translating, and to speak additional languages, such as English.
12. Improve the financial, productive, and distributive structures of the economy to provide the basic "supporting industries" for communications on all levels—the services which industry as a whole provides, the materials it supplies, and the communications channels it requires and builds for its own use but which become available for other communications.

An important result to be expected from communications projects--and to be developed consciously--is the "multiplying effect." As the underdeveloped areas begin to get more communications and to see the value of it, they will speed up the processes themselves, to reduce red tape and customs and trade barriers, for instance. As communication people are trained in these countries, new leadership and a better balance of leadership are being developed thereby, to help in other aspects of development. Forces are being set in motion in all directions. The whole American concept of open sharing of information--a fundamental of sound technological development--is something which many people do not understand and therefore distrust; as they see increasingly that there are no strings attached, that American business is sharing, that the whole ICA program is what it says, and that it does have value, their opposing system of secrets and closed information channels must give way and allow a freer flow.

Even if only the host government itself learns the lesson, much will have been achieved. "One of the weakest things in government is the simple channeling of information," the SRI team was told. "We get it to them, but where does it go?" There were harsher criticisms from many sources: "One of the greatest obstacles is government itself," one observer said. "Its laws, taxes, red tape, licensing, inefficiencies, artificial factors, delay, corruption, and political influence all work against information and action." Communication can work against the obstacles, to show the government, first, what one hand is doing to the other, and second, how the obstacles can be overcome. Any conscious effort to improve communication in government helps the whole process of government; familiarity with the term "communication" itself makes people increasingly think of trying it themselves.

The same principle holds with the people as a whole. Literacy movements start because people find there is value in learning to read; they continue to read as they find their reading material is more and more valuable. Therefore, the level of technical and scientific information at all times must be somewhat ahead of the level of reflected needs of the people, to be sure it will be available as the next higher needs are felt by the people. Technical information--specifically industrial technical information--can be of direct help to the literacy program by using industrial subjects in literacy reading materials and by paying attention to a publishing industry to serve these new readers with materials which will keep them reading. From ICA's point of view, this should be worth doing as part of a program of building up a climate of understanding of technological matters, for the reasons noted earlier.

One of the early results of communication, and one of the greatest potential multipliers—as well as an aid in building a solid democratic society—is the number of organizations which develop. As people become involved in communicating, they find further value in enlarging the scope of their communicating process and making it more lasting. Thus, an organization is born. A spectacular and pertinent example is the Organization for European Economic Cooperation, which grew in large part from a desire for machinery with which to exchange technical information. One "secret" of developing communication and making its gains permanent is involving people; and for the long run it would seem advisable to develop the patterns of society by developing the lines of communication, since organizations form along communications lines within a society in exactly the same way that civilizations themselves form along communications routes.

The development of organizations, in turn, has an important result in terms of speeding technological change. An individual who might otherwise be prompted to undertake some sort of innovation—e.g., an improved management technique such as human relations—is deterred because of what others around him might say and do in disapproval. When a group exists which can discuss such matters and decide together that the innovation is a good one, the change then occurs more easily and probably more rapidly. Society as a whole may remain a conservative force, but segments of it may be able to achieve progress more rapidly than isolated individuals.

#### F. The Need for Technical Aids Materials

A major need not now being met adequately is for technical aids materials. Compared with personnel, materials, and financial aid, technical aids materials are a relatively small budget factor. Furthermore, by their very cheapness and unobtrusiveness as against huge grants for such spectacular projects as dams, technical aids tend to be underrated. One small pamphlet, one film showing, probably is very little in itself. (One must say "probably" even so, because it is impossible to know when "one small pamphlet" may ignite one reader to do very great things indeed.) But when all of these separate small items are compounded, they can add up to a considerable impact—particularly if they are used dynamically by people with a mission, as would be the case with a USOM consciously developing a communication complex. And in underdeveloped areas where the competition for a man's attention is low because of the difficulties of communication, the influence of technical aids is probably much greater than is generally recognized.

As detailed below, technical information has two broad values:

1. It services the technical assistance programs.
2. It provides the information which is the grist for the mill of the communication complex, so far as technological development is concerned.

#### Service to Technical Assistance

It should be clear that technical aids are no substitute in any real sense for people, the specialists who go over with their know-how and impart it firsthand. But if technical aids are not a substitute for people, they are a tool for people, making it easier for fewer people to do better work more quickly and cheaply. In one Mission, the SRI team was told: "We have 400 experts here, operating at 30 to 40 percent efficiency because they don't have the tools to get their story across." An increase of even 10 percent in efficiency in one Mission with 400 experts would save enough money to be a sizable part of the entire technical aids budget. In any event, it is a cheap assist to any project, and if it only occasionally makes the difference between success and failure, it has paid for itself many times over. This is because failures in ICA projects do not merely mean the loss of a certain sum of money and a certain amount of energy. They mean loss of face, loss of opportunity, loss of the right time to be of positive influence.

Technical aids increase efficiency among experts for a very simple reason: the experts are usually subject-matter specialists, not teachers, and yet a large part of their job often is actual teaching in one form or another. They often simply do not know how to teach, and there is little machinery set up to train them how to teach--partly because as an "expert" the technician feels he cannot afford to admit he needs help. In this circumstance, technical aids are a painless face-saver and a real help to the technician. They carry a large part of his teaching load. Audiovisual people in the United States are always quick to assure worried teachers that audiovisual materials do not replace a teacher--which is true. But they are a reasonable stand-in where there is no teacher, and they certainly can be of great help to any teacher.

There are still other ways in which technical aids materials can help experts:

1. In Iran, a film mobile unit went ahead to each village which was to be visited by health technicians with DDT spray. After the villagers had seen explanatory films the night before, the villagers were invariably happy to work with the DDT technician when he came in the next day. The motivational factor, of which this is a simple example, is not to be overlooked.
2. Technical aids are good "door openers," i.e., they give the Industry Officer or any specialist an excuse for visiting an official or private leader, or for delicately bringing up a matter which needs settlement.

Furthermore, in some ways technical aids have advantages over people: they are available on a take-it-or-leave-it basis; no one is forced to read a pamphlet as he may be to talk with someone who calls upon him. The personality element is eliminated, and the subconscious irritant of taking aid from a foreigner is avoided. There is no adverse reflection on anyone for reading a pamphlet; he can do it in private if he wishes. The reader is not seriously indebted to anyone afterwards for the aid; the author is not present, and the owner of the pamphlet can have it back, if need be. The reader does not have to register his acceptance or lack of it on the points made; no one is standing over him to commit him. And if he likes it, it can have a multiplying effect, because he can pass it on, or at least tell someone else where to get a copy for himself.

Most of the references above are to printed materials, and it is true they apply less well to films and other such media which usually require the public presence of the recipient of the aid. But they can apply to other media such as radio, and the general sense of the matter is applicable to the whole technical aids program--if the program is not jeopardized by propagandistic efforts to claim credit for ICA, or introduce other purposes than the straight giving of technical information.

In one other important respect, technical aids should be seen in relation to experts. Because, in the underdeveloped areas, so many different kinds of industries are involved on so many different levels and with so many unusual specifics, it is difficult if not impossible to hire specialists who can "cover all bases." Since guesses or generalities do not help, and often are quite harmful, the USOM Industry Officer needs technical aids services all the more, all the faster, all the more

specifically. And, conversely, because it is thus possible to get the specialized help when needed, it becomes possible for ICA to assign more "generalists" as experts who can do double or triple duty in the underdeveloped areas. (It follows as a principle that technical aids materials should be as broad and varied as possible on all levels, from basic production to consumer goods and distribution, as well as in other fields such as health, agriculture, public administration, etc.)

#### Contribution of Technical Aids to the Communication Complex

The second major service of the technical aids program is its direct contribution to the communication complex. It is clear that in a technical assistance program per se, technical information is a prime ingredient. While much of this technical information comes via "people," and the people are indeed part of the communication complex insofar as they help carry messages and build organizations within their subject-matter fields, there is a less limiting advantage to technical information which is transmitted by one of the communications media. It has a life of its own--a currency value, literally like money, that can be spent and respent as it goes from one person to another, perhaps being put to different uses by different people. It is the "fuel" which makes the communications machinery work--it is the subject matter for which the machinery exists, at least in its technological purposes. A pamphlet, furnished in English by the Technical Aids Branch in Washington, must be translated, edited, and produced locally--giving communication experience to the host-country personnel doing the job. The pamphlet goes out and stirs comment, which leads to action. A speaker needs information for a luncheon meeting of the Rotary Club. The pamphlet may well be his speech almost verbatim, and what one member of the audience has read and another has heard about, and they have discussed jointly, is now being told to them in still another way. There is impact, which leads perhaps to further organization and ultimately to action. In the course of finding its way to action, technical information has been grist for the mill of a fledgling communications industry, and it has helped broaden the country's communication complex, making it easier for the next message to add to the development.

Technical aids materials have a democratizing effect as part of the communication complex, because information is generally democratic if openly offered. Anyone can use it, to his own purposes, and often enough use it to withstand an authoritarian use of other knowledge. In a very real sense, knowledge is power, and thus spreading knowledge means spreading (i.e., equalizing) this power. This is one of the essential values of a communication complex, as well-developed as possible, as part of ICA's basic purpose. There is an impatient tendency even among democratic

people, when they are involved in a single frustrating problem, to brush aside democratic procedures and force their own idea through. Because this temptation is likely to be aggravated in the underdeveloped areas, and likely with worse consequences than in broader-based societies, the antidote of as much technical information as possible to block precipitate action is useful. Specifically, in productivity centers or technical information centers, where the information dispensed by relatively few men can have wide effect, the stabilizing influence of carefully prepared and impersonal technical aids can be very important. There are personality quirks and perhaps private ambitions (i.e., politics) in most persons, including specialists and administrators, and against their ups and downs and personal preferences, the objective tangibilities of technical aids materials can actually help keep a program on a steady keel.

There is, incidentally, another value to the tangibility of technical aids. Against the flashy projects the communists are offering, and in a situation where making a propaganda show of American aid would only backfire on the U. S., it is important to have at least something tangible for the people. It may not seem much, but it is a contribution; someone is doing something in a positive way, and there is tangible evidence in hand. For some people who are so frustrated at impasses that they can see no way out but communism, this can have its effect.

This point may seem farfetched, and there are some who may have the same opinion of the whole list of "advantages" discussed above. And in truth there should be no feeling that technical aids are a panacea or even a major answer. Technical aids without experts may even be harmful on occasion, as when a would-be entrepreneur proceeds to build a factory on general advice gleaned from a book when he should also have had a specialist's assistance in view of his particular problems. The user of technical aids needs personal guidance as well.

And yet it is certainly one of the lessons of communication that no one can ever know its full effect. To give but one example which came to the SRI team's attention: The "Plant Requirements Primer," produced by the Technical Aids Branch to present would-be entrepreneurs in underdeveloped areas with the ABCs of starting a new plant, is being adopted for use in Burma, because a UN official, who had been urging such a publication, saw it and used it to convince his host government that it really was feasible. Thus, ICA material will have a direct effect in a country which does not desire an ICA mission. How many times this happens--how many times a pamphlet goes on a shelf and is later picked up by someone else--how often a manual prepared for a seminar is taken back to a plant and made the guide for a whole plant reorganization--these are

impossible even to guess. But it is in the nature of communication that these things do happen.

The SRI team found at least the following groups among the direct recipients of technical aids materials through the various Missions: top host-government officials, planning and development experts, ministries, manufacturer-owners, managers, bankers, engineers, productivity-center personnel, researchers, foremen and supervisors, factory workers, home industry workers, international agencies (such as UN, ILO, etc.), the press, educators, students, and USOM personnel. When one considers the effect these direct recipients can have on more than a billion people in some 70 countries, one realizes that the magic of mass reproduction and distribution of technical information can create impressive results.

## Section IV

### A BROAD PROGRAM

Public Law 665, the Mutual Security Act of 1954 (as amended) is "an act to promote the security and foreign policy of the United States by furnishing assistance to friendly nations...." Title III of this law— Technical Cooperation--states, in Section 301:

"It is the policy of the United States and the purpose of this title to aid the efforts of the peoples of economically underdeveloped areas to develop their resources and improve their working and living conditions by encouraging the exchange of technical knowledge and skills and the flow of investment capital to countries which provide conditions under which such technical assistance and capital can effectively and constructively contribute to raising standards of living, creating new sources of wealth, increasing productivity and expanding purchasing power."

This law is a recognition that there is "a war going on" in the underdeveloped areas today, on at least three fronts:

1. The War Against Human Misery. Not only is there a very low standard of living in the underdeveloped areas, but it is possible to show statistically that populations are increasing so rapidly that great economic and agricultural strides forward are not enough even to keep up, much less get ahead.
2. The Social Revolution. The struggles for independence and political, economic, cultural, and technological changes have set imponderable forces in motion. When they combine with the bursting-out effect of population growth, these forces can go in directions harmful to the world's security, unless somehow enough wisdom and skill can be marshalled to harness them to useful, positive results.

3. Communist Imperialism. Taking advantage of the problems of the underdeveloped areas' peoples, the communists have set up a battlefield to conquer these areas. The "cold war" is thus a tangible factor.

This three-sided war requires positive, bold, and resourceful action. The agency charged with technological development, therefore, has a considerable responsibility.

Beyond the obvious reasons for urgency, there is a special one. It is now that changes are being made in the underdeveloped areas; changes are in balance which will go one way or the other, and in many instances, relatively slight additional effort will bring about a change in this direction instead of that. Once the direction is determined, and as time goes by and the new patterns are evolved and solidified, it will become increasingly difficult to change the new direction. This is the time, therefore, which can provide the most fruitful results for intensive effort, even in a long-range program. The long-range emphasis should not be an excuse nor encouragement of any apathy or contentedness with plodding along, nor should the admitted danger of precipitate action in delicate social situations allow a "one step at a time" approach to serve as an impediment to bold and imaginative action. It is important, of course, to go slowly enough to be sure that the society can and will make the desired change; but to go literally one step at a time, as this approach is sometimes applied, can mean going from foot transport to animal to cart to rail to truck to airplane, when it is apparent that sometimes one jump can carry all the way to the airplane.

As the team was told by a U. S. official in Italy, "The mistake of the Marshall Plan in Europe was in not recognizing earlier the potentialities of our program in helping Europe shape its thinking. Productivity is more than mere productivity. It builds institutions and a general kind of thinking which lead to progress across the board."

For the underdeveloped areas, with so much more than productivity to concern them, the opportunities for helping the people with their social revolution are even greater.

The recommendations of this report are based on one further fundamental conclusion: there is a qualitative difference between the approach built up by ICA and its predecessors to serve European recovery and the approach needed to help the underdeveloped areas. In Europe, the problem was one of catching up; in the underdeveloped areas it is one of catching on; instead of a speed-up, a start-up is needed. It was possible, under the Marshall Plan, to convey technical information to Europeans in already-established terms, and no vast changes were sought; a quantitative improvement

along common lines achieved the tangible results desired. Even the opportunity to "remake the thinking of Europe" involved thinking on matters still within a common context of Western civilization. In the underdeveloped areas, the civilizations are different, ideas and thinking are different, and therefore values are different. There are thus different "barriers" and obstacles, as well as different levels of development.

In the practical problem of how this affects the technical aids program, more is involved than the possibility of making the Technical Aids Branch "more efficient." In Europe, it was clearly a question of providing primarily American technical know-how; in the underdeveloped areas, it is a question of bringing to bear the know-how which will best serve the particular problem, and this could well mean that U. S. experience, with its modern technology, might be of less value than experience developed on a level only slightly higher in a neighboring country. The true technical aids function thus becomes not only transferring U. S. technical know-how, but facilitating the exchange of useful and appropriate know-how from wherever it may be available. This involves a clearinghouse function, among other things, and for that reason one is recommended in this report. Basically, it means that the whole technical assistance program must be much more flexible and imaginative and comprehensive and versatile, to meet all the variety of problems on all the variety of levels and the greater complexities because of the numbers of people involved and the consequences of the impact.

The ICA technical aids program can be bold and dynamic, or it can plod along, depending upon the total ICA climate. It can recognize the role of communication, and its responsibility in that role; it can produce materials which are a positive force in shaping the social revolution by its technological motivational materials, by its attitude of service, by its aggressive searching for new ways of aiding technological development. There is good evidence that this is its present direction; the conception of this research study itself is a case in point. But if there is frustration or lack of impetus in the field, or a policy edict reversing an established program, the Technical Aids Branch might become little more than a procurement service, merely meeting whatever specific requests come in from the field.

As reflected in the specific recommendations of this report, this "broad view" leads to a proliferation of services, media, personnel, and projects—so much so that a quick reading might give the impression that there has been no regard for the taxpayer's dollar, for administrative difficulties, or for balance with the rest of the ICA program. What it actually indicates is a shift into high gear in providing technical

information, to bring it into balance. Considering that technical information is in reality central to technical assistance, it is not profligacy but economy to bring technical information services to a point where they may do their full part to insure the efficient operation of the entire ICA technical assistance program. The same total ICA allocation will be better spent by budgeting a larger part of it to provide technical information services at their proper level.

A. Need for High-Level Coordination

The point has been made that ICA is a communication agency--at least insofar as it is engaged in technical assistance, as distinct from economic or military assistance. If it would be untrue to say that ICA generally does not know it is a communication agency in this sense, it would still be fair to say that ICA does not take full advantage of its opportunity to use the communication approach and communication techniques to advance its total program.

ICA's line operations, especially in the field, are organized under subject-matter divisions--education, agriculture, community development, industry, etc. The line responsibility for communications as a subject-matter field rests with an official who is really in a staff assignment--the Audiovisual Officer. So unstable is the emphasis on communication that in many USOMs the Audiovisual Officer has become involved with line responsibility for one specific communications project--often an audiovisual training service for the Education Division--and ends up neither as a staff audiovisual service to the other divisions of the Mission nor as a line officer responsible for the communication complex as a whole. Both functions suffer in the preoccupation with a tangible project.

Because the needs of the underdeveloped areas are not easily categorized, there is a great deal of overlapping. Consider the Industry Division, and its technical aids: providing a training manual to industrial management would seem to be clearly within Industry's jurisdiction, but if the same manual is useful in a formal school course, is it Education's jurisdiction? Are labor-management subjects properly to be developed and distributed by the Industry Division or by the Labor Division--or should each develop and distribute its own, and from divergent points of view, so that ICA can be caught by diligent communists on a charge of being two-faced on the subject? Is developing a printing plant an Industry function or that of the Audiovisual Officer? Is motivation a matter which should be touched at all, and if so is it something for the schools or something for management to develop among the labor force? Is rural industry, particularly that involving the off-season work of farmers, a

concern of the Agriculture Division or the Industry Division? And what about the development in the Philippines, specifically, in which the schools are most definitely in the small industry field, actually managing production for export?

These questions are meant neither rhetorically nor accusingly, but to pose the complexity of the problem which must be faced.

There is almost certainly no easy answer to the administrative questions involved. As the SRI team was told by an American working in Turkey, "The people who try to give us a fast answer as to how we ought to do things should realize that if there really was an easy way to do it, we'd have done it long ago." The division approach is probably inevitable, and there are laudable efforts to coordinate them not only through the Director's office but through a Program Officer as such. This is an administrative control, however, rather than positive guidance, in complicated situations. The Program Officer usually must perforce rely on division heads to take much of the initiative for specialized programming, while he coordinates what is presented.

A functional approach is needed, not to displace either the subject-matter divisions nor the Program Officer, but to provide positive initiative in the overlapping areas and more importantly in matters which are too comprehensive for one division to handle.

The communication complex is suggested as an example of such a need for a functional approach, although it is by no means the only one. In the ICA Mission in India, the Community Development Division has in practice, if not in theory, adopted a comparable approach. Instead of building up its own subject-matter specialists and engaging in projects which would certainly overlap those of many of the other USOM divisions, Community Development coordinates the efforts of the other divisions to undertake projects needed for its program. It is possible to conceive of a country whose basic problems are those which the community-development approach can best solve, and there it would be feasible to make community development the integrating device, as has been done in a special way in India. But for most underdeveloped countries, including India, there are problems beyond the village level, and community development is not enough. In fact, community development itself can be seen as one communication apparatus which is part of the communication complex as a whole.

For these reasons, the SRI team recommends an organizational change, which will be relatively minor in terms of numbers or duties of personnel, within ICA/W and the Missions. In terms of dynamics and integration, however, it may be of substantial value.

This recommendation is outlined in the next subsection. In its details it may well be subject to modification because of administrative matters beyond the knowledge of the SRI team. However, its essence is simple and may be approached in various ways. All it seeks to do is to charge an active interdepartment group with responsibility for an overview of the communication complex and for initiating pertinent projects, in an order of priority, to be carried out through the line divisions.

It should again be noted that this recommendation stems from an analysis of the function of the Technical Aids Branch, and is offered to help overcome what may be considered an "obstacle" to the best utilization of technical aids services--namely, the lack within ICA of a dynamic concept of communication per se, and of a functional organization to achieve the full benefits of a technical information service. With these defects remedied, the role and organization of the Technical Aids Branch might be considerably different, as will be detailed.

#### B. Suggested Organizational Structure

The communication complex cuts across most, if not all, divisional subject matters--industry, education, public administration, etc. This is recognized in ICA Manual Order No. 1410.1, "Audiovisual and Mass Communications Activities," dated November 16, 1954. However, while the order speaks of coordination and development of cooperative projects, it does not really provide a central leadership to effect this. The Overseas Audiovisual Service (OAVS) in ICA/W and the Audiovisual Divisions in the Missions, as provided in ICA organizational directives, are the closest approximation, but, as shown below, the arrangement does not appear strong enough. It would not appear to require a great deal more, however, to achieve the intent of MO 1410.1 effectively: simply provide a communication staff coordinator at a high enough level within the technical services framework to insure that his recommendations get due weight among the line divisions. The line divisions would continue to have responsibility for the communications projects as such.

The present OAVS Division cannot provide such leadership in ICA/W, even though it is doing excellent work within its limits, because it is under three handicaps: (1) since it is separated from the technical services structure, it cannot be properly integrated into technical services programs; (2) it is too closely connected with public relations functions to get its due separate strength and attention; and (3) its technical functions are too identified--in practice at least--with the strictly audiovisual activities rather than with communication-in-the-large. The official to whom OAVS reports, the Director of Public Reports, cannot help substantially

for the same reasons, particularly the second. However, it might be feasible to adapt the Office of Public Reports and its OAVS Division into the plan recommended below, provided the public relations and audio-visual functions could be fully subordinated to the general communications function and the titles altered appropriately to reflect the new emphasis. The fact must be faced that communication is an inseparable subject which ought not to be delegated to a single subject-matter division. It is fundamental to all human activity and must therefore be an integral part of all programs and projects in all divisions. Each division must accept responsibility for the communication aspects of its own operations. Any new division given line responsibility for the whole communication function must therefore impinge upon the older division's duties, engendering friction and confusion rather than coordination. Given ICA's basic subject-matter organization, the only solution appears to be staff coordination which leaves line responsibility intact.

The missing ingredient, therefore, is a central communication staff or advisory function within the technical services setup. The head of such an operation might be called the "Coordinator of Communication Programs." An outstanding communication specialist with knowledge of international developmental problems and techniques, he would function along the following lines:

1. He would have a Communication Coordinating Board consisting of representatives of technical services and operations desks, together with the heads of technical information activities such as the OAVS and the Technical Aids Branch. The Board would meet regularly and with fair frequency (perhaps every two to four weeks) to keep continuous contact with plans and projects affecting the communication complex, and to make pertinent recommendations to the appropriate officials.

2. The Coordinator would have personal responsibility as a liaison to work with the various officials and units involved in the communication complex, to provide the leadership for an aggressive and constructive program.

3. The Coordinator would have a small personal staff to receive and process the information upon which he and the Board would act.

4. A recruiting and training program would be established to develop personnel for positions on the USOM level comparable to the Coordinator of Communication Programs. Special courses under contract to a qualified university might be involved. The official directly responsible for this training program would also be responsible for the training of the other officers as indicated below, probably in one comprehensive

communication "school." The program would include assistance in development of training programs and schedules for participants from other countries in the mass communications field.

5. The Overseas Audiovisual Service Division (OAVS) should be strengthened to make clear that it backstops all communication activities, and not audiovisual alone. It would be under the Coordinator of Communication Programs to integrate it better with the units it serves. OAVS would have the following responsibilities, as at present with one major exception:

- a. Provide leadership in the communication field.
- b. Provide technical backstopping to audiovisual technicians and Technical Information Officers (defined below) assigned to USOMs, including assistance in original recruiting and training or orientation.
- c. Effect exchange of audiovisual and other communications ideas, techniques, developments, and materials among USOMs and between OAVS and USOMs.
- d. Provide the liaison for offices under the Deputy Director for Technical Services in ICA/W in contacts with producers and suppliers of audiovisual materials.
- e. Provide assistance to the technical service divisions (Education, Agriculture, Health, etc.) concerned in the preparation of subject-matter catalogs and bibliographies, and in evaluation of available materials.
- f. Coordinate the purchase and use of audiovisual materials by maintaining data on internal (ICA) availability of equipment and supplies, and by arranging loans and exchanges among USOMs.
- g. Assist in the training or orientation of USOM Coordinators of Communication Programs and Technical Information Officers, and in the development of training programs and schedules for participants from other countries in the audiovisual field.

The major difference between the above list and present OAVS responsibilities is the elimination of line authority and responsibility on contracts for carrying out audiovisual and mass communication projects in USOMs, in line with the general approach being proposed in this report.

The principal reason for distinguishing between technical communication support and the subject-matter line divisions has already been given--i.e., communication is such an integral part of every subject-matter program that it cannot be separately delegated. This can be made clearer, perhaps, by viewing the problem from the standpoint of these line divisions, in relationship to the present audiovisual services offered.

Each subject-matter division has need for technical information, and part of its program involves the dissemination of that information. How it is disseminated--the technique, e.g., whether through films or personal conferences, etc.--is important, and advice and support should be available from specialists in such techniques. But the controlling factors are the technical know-how itself, on the one hand, and the intimate and day-to-day working relationships with the recipients of this know-how, on the other hand. Both of these require subject-matter people with line authority, and at the very least a kind of integration within a program which can come only from having the personnel involved serve under the same line authority. A central adviser can be useful, but a subject-matter program cannot very well rest on such a person.

The need for obtaining and disseminating technical know-how is central to each subject-matter division, however, if ICA's technical assistance program really is to provide technical assistance. The present practice is to rely largely upon personal dissemination, in two ways: (1) to obtain experts who already have the know-how and send them overseas to pass on their knowledge, and (2) to bring appropriate persons from host countries to the United States to observe and study, and thus obtain the know-how for themselves. The Technical Aids Branch of the Office of Industrial Resources represents a third way, to obtain know-how from various experts (at present mostly in the United States) and send that know-how overseas through printed materials and other media, such as films, for dissemination through USOMs and experts there.

It is a fundamental recommendation of this report that this third approach be greatly expanded, for the reasons shown above in "The Need for Technical Aids Materials."

### C. Technical Information Activities in ICA/W

In view of the advantages of technical information materials at relatively low cost, it is believed important to expand the activities necessary to achieve optimum use of this resource.

This study has concerned itself primarily with the way to do this in one subject-matter organization--the Office of Industrial Resources--and the recommendations concerning its technical information activity--the Technical Aids Branch--are detailed in this report. It is suggested, however, that the arrangement recommended for the Technical Aids Branch can serve as a prototype for comparable operations in ICA/W technical services offices other than Industry, and for that reason the principal elements of the program are included at this point, in generalized fashion to serve the total technical assistance program.

Each technical services office would have a Technical Information Staff. While its exact status and position would depend upon management considerations beyond the scope of this study, for convenience it will be referred to below as a division--the Industrial Technical Information Division, or ITID, in the case of the Office of Industrial Resources. The term "technical information" is intended to distinguish the subject matter from public information (e.g., news releases to the press) and to go beyond technical "aids" in the sense of audiovisual "aids" by stressing the actual subject-matter content of the technical information materials furnished to the field.

To achieve coordination within the particular ICA/W office, the Technical Information Division Chief concerned would have an advisory committee made up of representatives of other divisions and desks, to insure correlation of technical information with the program needs and to get guidance on such publications as the house organ. The ICA Coordinator of Communication Programs would serve ex officio on this committee.

The Technical Information Division would have these responsibilities:

1. Finding and bringing together technical information from all over the world, pertinent to the subject matter of the division.
2. Preparing the editorial content for media by which pertinent technical information is to be disseminated.
3. Arranging for the production and distribution of such media.
4. Conducting the necessary feedback and evaluation procedures to keep constant check on the efficacy of its operation and on needs for further information.

5. Acting as a backstopping service for technical information officers in the Missions.

The foregoing responsibilities, as they pertain specifically to the Office of Industrial Resources, are discussed in Section V.

D. The Communication Program in the Missions

The same problem exists in the USOMs as in ICA/W with respect to Manual Order 1410.1, although there is at least the intent that an Audiovisual Division be set up in a Mission where feasible to service the general function of servicing and stimulating a communication program. The SRI team noted, however, that in practice the functions of the Audiovisual Officer often are limited in one or more of these ways: he is a staff technician, helping with audiovisual problems, and as such has little policy influence, or he has been requisitioned originally by a division (most often, Education) and "belongs" primarily to that division. He provides audiovisual assistance to other divisions as time permits (which is seldom) but he cannot effectively function in a line capacity to develop a communication program. Starting originally as perhaps the ideal Audiovisual Services Director envisioned in MO 1410.1, he has become so involved in a specific project (usually a national audiovisual center of some kind, and often primarily for the Ministry of Education) that he has no time to develop the breadth of interests and contacts necessary to lead a program for the communication complex as a whole. It would appear that the tangible and specific nature of an audiovisual program, as against the diffusion necessary to implement a broad communication program through the various line divisions, works in such a way that the Audiovisual Officer ends up giving audiovisual the emphasis over communications-in-the-broad. In any event, as has been explained, the attempt to place communications project line responsibility outside the subject-matter divisions can be expected to lead to confusion rather than integration.

To clarify and buttress MO 1410.1, it is therefore recommended that the USOM set up a structure paralleling that proposed for ICA/W: there would be a Coordinator for Communication Programs, and the Audiovisual Division, limited to staff services, would come under his cognizance. (Any line audiovisual project, as for instance an audiovisual center developed for the host-country school system, would be a line division project, and an audiovisual specialist would be requisitioned by the Education Officer for his own staff.)

The Coordinator for Communication Programs could fit into the table of organization of the USOM in various ways, depending upon the size and complexity of the Mission. He could be a staff advisor to the Mission Director, or an Assistant Program Officer (or perhaps the Program Officer himself, in smaller Missions), or the Technical Information Officer of any one of the line divisions (probably Industry Division, or conceivably Education, Public Administration, or Community Development) given the additional assignment. This last alternative might appeal to the very smallest missions, but it may be pointed out that it is often in the countries with the smallest Missions that the greatest host-country communication problems exist; therefore, the alternative might not be the best under the circumstances.

The Mission Coordinator for Communication Programs should be a trained communication specialist (hence, the suggestion in the second alternative above, that he could be the Program Officer himself, is not advisable unless the Program Officer happens to be a communication specialist). Communication seems simple common sense in many aspects, because communication is such a basic process in all human activity that everyone must have had some experience in it. The fact remains that it has also a highly professional level, requiring a combination of specialized techniques and a working knowledge of the people and resources of the area. For this reason, the suggestion is made that communication coordinators be given special communication training, and it would seem advisable also to provide perhaps a three-month intensified course in the culture, history, geography, etc., of the specific areas in which they will serve.

The USOM Communication Program Coordinator would, as in the ICA/W setup, work with a board or committee representing the subject-matter divisions, and as a staff officer he would work with line officers to help integrate their programs. Specifically, he would work as an advisor to the Technical Information Officers and the extension service project personnel, but he would have no line cognizance over them. As indicated he would have cognizance of the Audiovisual Department, and in certain circumstances he might also be the Audiovisual Officer, although for the reasons indicated this would not seem wise as a general rule, unless the concept and title of the audiovisual function can be broadened to put emphasis on general communications.

Except in very unusual staffing circumstances, it would appear extremely unwise to delegate any Mission public relations functions per se to the Communication Program Coordinator or his staff, for two reasons: (1) there is always a tendency to use communication personnel interchangeably, but public relations functions have a way--because of the

pre-emptory high-policy and big-consequences nature of their problems--of taking a disproportionate amount of time in a combined job, and without regard to established priorities, and (2) there is danger of a backfire when the U. S. seeks credit for its technical assistance efforts. When a communication specialist is working with the mass media of a host country to help them improve, he should not be the same official who may be providing these media with public information materials, lest the local people draw the obvious conclusion that his only reason for providing technical assistance is to buy consideration for his "propaganda" materials.

Again as suggested for the ICA/W setup, each technical division in a USOM should have a Technical Information Officer, skilled both in communications and subject matter, and working with the Audiovisual Officer and under the general context of the coordinated program guided by the Coordinator's committee. The duties of this officer are outlined in detail in Section V.

It is recognized that some Mission Directors may consider that elaboration of the communication and technical information program is unwarranted. The SRI team believes the Directors' judgment must be respected, and certainly any communication program forced upon them can hardly succeed. However, if ICA/W can clarify and strengthen its own position regarding the importance of communication and the furnishing of technical know-how per se, and if it will augment its technical information services to the field, it should be much easier for most Mission Directors to justify expansion of their own communication staffs to take advantage of the new resources being made available.

## Section V

### ORGANIZATION AND SERVICES OF THE TECHNICAL AIDS BRANCH

This section is devoted to a possible elaboration of the industrial technical information program in ICA/W, and the related links in the chain of communication. While it is submitted in this report to meet the specific problem posed to SRI, it may also have value as an indication of how comparable programs might be mounted for other ICA subject-matter activities.

In line with the objectives of the work assignment, the team kept searching, during its study, for some fundamentally new approach to the problem of disseminating technical information to the underdeveloped areas. Although dactylogy (making signs with one hand) seemed too specialized for the purpose, practically all other varieties of communication techniques were studied, and a few new ones were invented for trying out. At the other extreme, the team even considered whether ICA's solution might be to concentrate almost exclusively on specialists in the field and to discontinue the whole subject of technical aids materials.

No fundamentally new approach was found. There appear to be no easy ways, no short cuts, no sweeping innovations to do the job. The basic need is for more intensive applications of tested communication principles and techniques, within the context of the policies and problems as described in Sections III and IV.

Technical Aids Branch is considered to be moving in the right direction and doing the right things. It needs more scope and status, and there are a number of specific recommendations of large proportions which Section V contains; but even assuming ICA agreement in toto to the general approach expressed in Section IV, much of the resulting action undoubtedly would simply be a speeding-up of long range plans already made. It is emphasized, however, that just this result is needed; the whole technical aids program should be enlarged and made more dynamic.

A. Role of the Technical Aids Branch

Within the broad context outlined, it is now possible to outline more adequately what should be the full role of what is now the Technical Aids Branch. The elements involved are as follows:

1. The materials and services of the Branch (including both the technical information itself and the motivational materials to achieve most effective use) should help achieve the goals of technological advance, development of production along useful lines, improvement of distribution and services, and increase of productivity.
2. In recognition of the particular need for localized action by USOMs to adapt to the unique and controlling conditions in the host country, the Technical Aids Branch must be geared to meet the Mission's needs both as requested and as anticipated.
3. However, from the vantage point of seeing world patterns in needs and opportunities, the Technical Aids Branch in ICA/W has a responsibility to provide leadership and initiative, without inhibiting local initiative.
4. The Technical Aids Branch, to achieve these objectives, must have its own communications organization for:
  - a. determining needs--which involves motivation, promotion, policy determination, field research, and planning.
  - b. getting the raw materials for the technical aids--which involves cooperation among all agencies likely to have the needed materials.
  - c. producing the aids--writing, editing, publishing, recording, etc.
  - d. distributing the aids--including services for other needs in other ways, e.g., the Technical Inquiry Service, catalogs for USOM procurement direct from producers, and backstopping technicians as required.
  - e. handling feedback, follow-up, and evaluation.

This breakdown reveals a number of further questions which must be taken into account. Rather than go into laborious detail as to how far existing policy covers these matters, it is preferable here to deal with the problems they raise and the possible solutions in terms of the program being proposed.

#### In Practice, Should Technical Aids Be a "Service"?

The SRI team found very little awareness of the Technical Aids Branch in the field, and among the relatively few who were aware of it as an entity, it was looked upon primarily as a procurement operation rather than a service or "backstopping" unit.\* One Audiovisual Officer considered it a "buying" organization because his film orders went through the Technical Aids Branch, but he produced letters from his file to substantiate his feeling that it is a "can't do" operation: the letters quoted reasons why meeting his needs was contrary to policy instead of trying to find some way to help him. (He did consider the Technical Aids Branch, however, "very efficient in its routine operations.") To make it more clearly a service, it is recommended that the Branch be relieved of procurement functions and responsibilities.

A true backstopping service such as Technical Aids Branch would meet an important need. Specialists now put out their own money to buy a book they need urgently for their projects, because they do not know where to get it quickly through channels or do not want to "fight" the channels. Industry Officers were happy to discuss their needs with the SRI team, some of them overeagerly assuming that the team had authority to give them immediate backstopping service and solve all their problems. It was difficult to ask their reactions to a suggested list of aids which might possibly be needed without finding that nearly all would be considered most useful. Many experts in the field, not knowing where to turn for help through channels, are writing unofficially to personal friends or contacts within the government, going to all varieties of desks with all sorts of problems--which must have an adverse effect on channels and operations within ICA/W. These experts also write directly to private firms in the United States for information which Technical Aids Branch (or perhaps OAVS) already holds, and aside from all other considerations, there is much haphazard and perhaps incorrect technical

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\* The one exception is the Technical Inquiry Service, most Industry Officers being aware of this as a specific service which is on call to meet their needs.

information being collected because these inquiries are not always directed to the right source in the right way. There is, furthermore, a good deal of resourceful improvisation by experts in the field, but it is wasteful for these experts to take time from their regular assignments to improvise materials which could have been supplied, no matter how admirable the spirit of resourcefulness may be.

There are substantial administrative reasons for a central technical information service: the overhead is less than in the field (in this international situation, at least); there can be consistency of policy; the problem of overseas recruitment is eased; the backfire from big overseas staffs is minimized; money is saved in the efficiency of one office's doing for many; and the central service is more efficient in being closer to the sources of U. S. information.

The implications are that the Technical Aids Branch must become more of a service organization and become better known as an entity with "personality," which is to say a reputation that causes experts in the field to think of it when they need technical information they cannot get locally. If it does not become such an entity, its services will not be fully utilized, and the unknowing experts will still be improvising and writing to personal contacts in haphazard fashion. The SRI team found right in ICA/W itself that there was vagueness and confusion as to the function of the Technical Aids Branch.

This report presents a number of specific recommendations which will, among other things, meet this problem: a house organ for ICA/W and USOM Industry personnel; increasing the scope of the Technical Aids Branch (as indicated henceforth by the use of the initials ITID, standing for Industrial Technical Information Division); expanding the use of Technical Information Officers in the field, with liaison to Technical Aids Branch in the same way Audiovisual Officers have liaison with OAVS; orienting all new technicians in Technical Aids Branch services; and, basically, a combination of improved and expanded services which will be active evidence that Technical Aids Branch is a service organization.

It is also recommended that a campaign be undertaken to inform the field that what is being offered henceforth is a new service so that past experience with delays and ineffective service will not carry over. If the general program recommended in this report is adopted, the occasion of building a communication complex consciousness, the appointment of communication personnel, the establishment of an industry division house organ, and the other proposals will make it a program which can be advertised as "new" in all sincerity.

These are not matters of "empire-building." They are simply recognition of the fact that in communication, as almost anywhere else, personal contact and understanding count. If the technical information program currently falls short of maximum utilization because it lacks this "personality," it is only good business to develop it.

#### What Are the Limits of Subject Matter Covered by the Technical Aids Branch?

While the Branch is part of the Office of Industrial Resources, and it could therefore be assumed that its subject-matter cognizance coincides, there are complications. Technical information has a way of crossing subject-matter borders, both in its content and in its use. Examples have already been given, but they may be briefly repeated: Is a labor-management pamphlet an Industry Division matter or a Labor Division matter? Should a book used both for in-service industrial training and for regular secondary schools be prepared by the Industry Division or the Education Division?

In film and book procurement, at present, the Technical Aids Branch has cognizance beyond industry subjects and is responsible for procurement of agriculture, health, and other subject-matter films and books.

This report carries a recommendation that the Technical Aids Branch be divorced from its present procurement functions. It would still, however, have the major responsibility for furnishing catalogs, evaluations, and other materials as a basis for selecting materials to be procured, so that the subject-matter line still would have to be drawn.

The SRI team has no definite recommendations as to where this line should be drawn, beyond offering one general principle: subject-matter technical information services should parallel as closely as possible the specific field units which will use them, rather than ever be centralized as an all-ICA technical information service. The risk of duplication is less than the loss of efficiency when one central operation tries to serve professionally various specialists without knowing enough of their subjects or their problems. And in servicing the underdeveloped areas, where the needs are so great and varied, there is little danger of providing too much technical information, if it is coordinated at the USOM level, as proposed.

In Part II of this report, therefore, there are listed a variety of subjects which may be within the scope of the industrial technical aids program, so that the proper authority may determine which of these

fall properly within the scope under any existing policy. In one respect only did the team make a "policy" decision, and this too may be treated to the same elimination process as any other category if the team judged wrongly: It was decided that "industry" includes the whole commercial and distributive aspects as well as production.

It should also be noted that the SRI team found no line division responsible for science as a subject matter, except insofar as Education covers it in the university curriculum. In terms of technical information programs, science might well be considered part of Industry's field.

#### B. Policy and Content Determination

As a part of the Office of Industrial Resources, an expanded operation such as the suggested ITID would, of course, be coordinated into the Office's programming through established channels and procedures. Communication, however, requires even more coordination to insure maximum effectiveness, and three bodies are suggested to achieve this:

1. Communication Coordination Board, an ICA-wide body headed by the proposed Coordinator of Communications Programs. The Director of ITID would serve ex-officio, as would the directors of other TIDs. The Board would be advisory to the line divisions and to the Director of ICA.
2. ITID Advisory Board, composed of representatives of various units of the Office of Industrial Resources, to advise the Director of ITID on program matters affecting ITID services. The Board also would serve as advisor to the editor of the Office of Industrial Resources house organ which is recommended below.
3. ITID Coordinating Committee, consisting of the heads of the various units within ITID, to insure a complete integration of all the channels and media which are part of the ITID program.

Even if Technical Aids Branch remains as is, and there is no Coordinator of Communication Programs for ICA as a whole, it is recommended that the Branch take the initiative to establish something like the Communication Coordination Board to advise it. This would be particularly useful if the Branch is to continue serving a broader subject field than the industrial. Likewise, Technical Aids Branch could gain from establishing an advisory board for the Office of Industrial Resources.

### Production of Technical Information Materials

The ITID would be conceived as the agency which (a) finds the best available published materials to meet a need, wherever in the world these materials might be found; and (b) gathers the raw material from anywhere in the world to produce the needed aids which are not available in finished form. To do this, ITID would have the following units:

The Industrial Information Pool, to serve as the "finding service." The workings of this pool are described in detail later. In brief, it would function through a staff of industry specialists who have among them a worldwide knowledge of sources of materials and projects which might yield techniques useful to underdeveloped areas. The practice of operating through contracts would be continued where an existing organization (such as the Office of Technical Services of the Department of Commerce) has the specialized techniques and resources to handle a given subject. However, beyond such contract operation, the staff would aggressively build up contacts, gather information, and otherwise work to make the Pool the authoritative central storehouse and clearinghouse for industrial technical information at all levels and on all subjects required for the underdeveloped areas.

The Editorial Unit, to take the information as provided by the staff of the Pool, and with their advice (which would include feedback from the field) produce the materials needed to furnish the field, through whatever media appear most effective. The editorial unit would include professional writers and editors engaged in a regular program of producing materials by techniques especially developed to make them most useful. The fact that the Technical Aids Branch does not have an editorial position in its present setup is an indication that present policy does not recognize the full implications of the Branch's role in communication.

The editorial unit would point its efforts to producing materials which can be redone in the field--by technical institutes, productivity centers, perhaps the USOM Technical Information Officer--to meet the unique local conditions for most effective presentation as well as subject matter. These are called "prototype" materials in this report, and will be described later in detail.

### Distribution

For all practical purposes, to the rest of ICA and to other users of its services, the "distribution" element would be the heart of ITID. It is the service for which ITID must become known, so that its resources

will be used to the fullest. ITID must be recognized as an entity, a Washington service which not only is representing the interests of the expert in the field but is also at his disposal--in a simple, direct, and quick way--whenever informational problems arise. It must earn a reputation as a "can do" and "will do" service.

To this end, all of the facilities of ITID would have to be geared to backstop the distribution unit. In many ways, the entire ITID staff might be considered "ex officio" parts of the Service Unit. For instance, one of the Technical Information Pool staff, in contact with an expert in some remote area to get information on one matter, might in turn be asked by that expert for some information on another matter. The information would have to be conveyed to that expert as quickly as possible, probably through the Pool man who got the inquiry, to help him build his contact.

The variety of channels which are open or can be developed to expand the program of disseminating technical information are described separately and in detail in the next section.

#### Feedback and Evaluation

The project trip demonstrated to the SRI team both the need for a systematic "feedback" to ICA/W and the tremendous complexity of determining true informational needs on any specific matter, under the great variety of conditions in the world. Even when the needs are described in the same terms by Industry Officers, they may be referring to different levels, or to different approaches, and often only detailed questioning can bring out the real meaning of each. A questionnaire or poll of USOMs on a proposed technical aid is of uncertain help in a given situation because (a) there is doubt whether all of the responses are really to the same question, because of local interpretation of the proposition being polled, and (b) weights have to be attached to the responses in terms of where they come from, the degree of interest indicated (if it can be judged), and the requirements of a specific country program which may make the matter more or less urgent to that USOM at the moment. For instance, if only the USOMs in India, Indonesia, and the Philippines believe the proposal has merit, but they are enthusiastic and insistent about its great value to their particular programs at the time, how should this be judged against a lukewarm answer from most of the other USOMs and a negative answer from the rest? Matters such as these must be decided by the ITID staff, on the basis of the best information available to them.

Similarly there must be systematic evaluation of the materials once they are sent out, not only to improve them if necessary but also because sensitive attention to the reaction to these materials may provide the best clue to further needs of the USOMs.

The channels at ITID's disposal for gathering information and for providing service would be the ideal source of feedback and evaluation, on a "built-in" basis.

### C. Channels Through Which ITID Could Operate

"Channels" are construed in this report to mean people and organizations as distinct from the "media," or particular ways of communicating (e.g., newspapers, books, films, pamphlets, etc.). The available or potential media and a list of possible industrial subjects for treatment through those media are discussed in Part II of this report.

Following is a list, together with detailed descriptions, of the "channels" which are or could be available to ITID both for getting and for distributing technical information. This list constitutes the specific recommendations as to how ITID might best overcome the "barriers" and meet the needs of the underdeveloped areas for industrial technical information. They are not shown in any presumed order of importance, because such a decision would rest on factors beyond the knowledge of the SRI team and because, in practice, if it were not deemed possible to use each channel to the fullest, it might prove best to use all channels to some extent rather than take the first three or four most "important" ones to the exclusion of the rest.

#### The Industrial Information Pool

As indicated above, the Pool would function through a staff of industry specialists who have among them a worldwide knowledge of sources of materials and of projects which might yield techniques useful to other underdeveloped areas. While in fact there would be a service unit within ITID to handle at least the routine of distribution, for all practical purposes the Pool would become the international clearinghouse for industrial technical information. The staff would represent perhaps the most versatile collection of specialists in the world on industrial techniques suitable for underdeveloped areas. Having access to American sources of information, being collectively on personal contact with USOM Industry Officers and Industrial Technical Informational Officers around the world, utilizing such other ITID services as the house organ, keeping current on

the work of other agencies' specialists in industrial development around the world, the Pool would become, quite literally, the Pool for the world in the exchange of industrial technical information at all levels and on all subjects required for the underdeveloped areas.

Such a pooling operation is clearly allowable as an ICA function under the provisions of the Mutual Security Act of 1954 (68 Stat. 832), Section 302: "'technical programs' means programs for the international exchange of technical knowledge and skills designed to contribute primarily to the balanced and integrated development of the economic resources and productive capacities of economically underdeveloped areas..." Section 303 provides that assistance can go only to a nation which "... (e) cooperates with other nations participating in the program in the mutual exchange of technical knowledge and skills."

Advantages of the Pool. The following advantages would accrue from such an operation:

1. While American technical knowledge continues to be most useful, there is need also for the kind of knowledge which more immediately fits the level of needs in the underdeveloped areas. The Pool would provide it.
2. Finding such knowledge, which is quite often already developed in a reasonably comparable situation somewhere else in the world, can save a duplication of time and energy involved in developing it again.
3. The exchange of such information--techniques which one country has developed to meet a particular problem or opportunity--gives other countries ideas beyond their present "felt" needs.
4. The mere ready availability of this knowledge saves time and energy among the specialists who otherwise would each have to take steps to find it, even knowing of its existence.
5. Specifically, the USOMs are already being forced into a kind of checking and exchange of information among themselves, and this can soon get out of hand as 50 or 60 Industry Officers and counterparts begin asking each other questions. The Pool, doing it once for all of them, will be simplifying procedures and saving time and expense.
6. The Pool would give the USOM Industry Officers and Technical Information Officers a more personal contact back in ICA/W on informational matters, and they would use these contacts with greater frequency and effectiveness.

7. The Pool would serve as a feedback for ITID, affording a world picture of activities and problems at all times and a tested evaluation of its own materials. Since it would be a simple and direct evaluation, and generally informal, it would come quickly and honestly, and allow adaptations in the ITID program while they would still afford maximum usefulness--in contrast with the usual evaluations which come after the program is completed and the opportunity for profiting from improvement has passed.

8. The staff of the Pool could, as a routine matter if desired, check over all materials prepared for ITID by contractors. The team was told there is not always the highest standard in contract work, yet the job of checking contract experts is more than an ordinary office could be expected to do. A group such as the Pool staff, however, would have an array of technical knowledge not often assembled, and it could most usefully undertake the prepublication check of materials, to insure (a) that the user was not misled, and (b) that ITID was receiving proper quality of work on its contracts.

9. Certain specialists on the ICA staff in the field have so much practical know-how of their particular fields that it is wasteful not to take advantage of them and to make their knowledge more widely available. At present, there is no systematic way to find and utilize the knowledge of such experts; the Pool would know about them and devise a way to make their know-how available to all.

10. Such a clearinghouse would be of value to the European Productivity Agency (EPA), the United Nations specialized agencies, and other organizations as well, but there presently seems to be no organization other than ICA capable of developing and maintaining the operation. The program thus would be a contribution to multilateral technical assistance by the United States, particularly if the other agencies were encouraged to contribute to it and use it.

Qualifications of the Pool's Staff. It is recommended that the Pool be inaugurated by selecting quite carefully the 12 or 15 staff men who would operate it, to insure the following characteristics:

1. Each should be a specialist in a different field useful to the underdeveloped areas--basic construction trades, mining, electrical, plastics, ceramics, metals, etc., so that together they represent the breadth of industrial know-how.

2. They should be "generalists" enough, and flexible enough, to be able to work together, to find perhaps new joint answers to problems, or to see new applications for principles or gadgets devised elsewhere.

3. They should, if possible, have a familiarity with at least one overseas area (although a later recommendation makes this not essential).

4. They should have a considerable number of contacts within their speciality in the United States.

5. If possible, they should have a communication background--at least enough to be able to cooperate with the writing and editing team to give practical communicable form to their expert knowledge.

6. They should be morally committed to staying with the Pool as a long-term project, recognizing that the base is Washington and that there will be considerable travel. (Building up know-how and contacts to the scale required is not feasible in a two-year period of service: the investment by ICA would not be worthwhile, and frequent gaps or changes would seriously impair the value of the Pool.)

Organization and Operation of the Pool. Each of the members of the Pool staff would first be sent to a different group of three or four countries, carefully selected to give him a cross-section and balanced picture of needs and conditions. He would spend perhaps a month in each country, making contacts with the variety of people who would be useful to him later as contacts. He would get to know the problems and needs of those countries, not only in his own specialty but in industrial technical information in general. He would seek out and take notes on unusual or promising projects. He would seek out also all the available reports and descriptions of projects which would be of interest. When all of the staff members were reassembled, they would thus have--among them, as a pool--a basic personal knowledge of practically every country involved in the ICA program; they would have contacts almost anywhere to get information, on a more or less personal basis; they would have brought back and assembled a store of useful information to begin disseminating; they would have leads for countless new developments to watch and report upon later, for their exchange value; and they would have a specialized knowledge of all the subjects involved, so that they could answer each other's questions and help each other to get fast action. When a replacement came on the staff, he would have the subject-matter qualifications of the man he replaced, and would go to the same countries to make the contacts anew and develop the same familiarity. The "old" members of

the Pool should systematically revisit the field to renew contacts, make new ones, and get "the feel" of changes taking place.

There certainly does not exist anywhere in the world the potentiality for know-how and service which such a pool would represent. In terms of number of people, the 12 or 15 men may seem a big budget item. In terms of their contribution, and in relation to the numbers of specialists they would be helping to make more efficient by giving them better materials and saving their own time in developing them, or in improvising, the investment would be highly profitable.

The function of the Pool staff would be primarily one of collecting, digesting, correlating, synthesizing, and disseminating information on a personal and group basis, but would not primarily involve production of materials for the field. The editorial staff would have the responsibility for this, although a particular specialist might be asked to prepare notes or perhaps even a rough draft of a pamphlet. The Pool specialists certainly should not have to be editors or production men. The Pool would have a final check on the accuracy and usefulness of the material prepared by the editorial staff and by contractors to ICA.

Each Pool specialist would be available to answer Technical Inquiry Service questions from his own knowledge; if OTS believed it useful, it could also request the pooled knowledge of the staff, or the material collected from around the world.

Another especially valuable service if the Pool would be the availability of both kinds of know-how needed--the world situation and the interrelationships of subject matter--to produce an original pamphlet or manual. For instance, if ITID determined that a prototype manual on rice storage was needed, each man in the Pool would contact his sources in his three or four countries, and also would draw upon his own experience in any related field. Together the specialists would collate the information and decide upon the best approach or approaches. The editorial department would sit in on conferences and write the pamphlet. Projects which now require more than a year in some agencies could be accomplished within a month or two by the Technical Information Pool.

Sources of Information for the Pool. A listing of possible sources for materials for the Pool itself gives some indication of how the Pool would operate. By personal contact, and by keeping in close touch with the professional and technical literature in his fields, the Pool specialist should be able to get much useful information (now mostly unknown or buried) from the following:

1. Materials developed in other divisions of ICA, for possible applicability to the industry field--especially small and cottage industry.

2. Materials developed in particular USOMs for their own needs, especially translated materials in languages that may be useful elsewhere (e.g., Italian material can be useful in Ethiopia and Libya).

3. Other U. S. government agencies and their publications, both for what they themselves do and for what they report. The Indian Service, with its own underdeveloped-area problems is a good source, as is the Agricultural Extension Service. The sources range all the way from classified government research (which may well have nonclassified by-products of special value) to reading of the Foreign Commerce Weekly. For a random example, the May 7, 1956 issue of that publication reports that Ebasco Services, Inc., will establish a papermill industry in Colombia at a cost of \$8,000,000. It also lists materials for which Iraq is allotting \$53,000,000 for imports of dollar goods in 1956. The Ebasco item is a lead to a contact which could prove mutually profitable to ICA and Ebasco. The Iraqi list is a realistic indication of some of the commodities which ITID might be helping host countries produce for themselves--dollar allocations being a reasonable evidence of need. If the Department of Agriculture is releasing surplus wheat somewhere, ITID should be prepared to make technical information available on using or processing it; even from a good will standpoint, U. S. technical help in meeting a specific problem would pay dividends, more than the mere seeking of credit due because the shipment came from the United States.

4. Old government files. These can produce a wealth of materials. The Institute of Inter-American Affairs did a great deal of pertinent work, the records of which should be helpful; the back files of the Indian Service and of Agriculture are other examples.

5. Vocational and agricultural departments of U. S. state school systems. The California Vocational Education Department, for example, has a good series on various basic trades such as machining and metal-working.

6. The American universities, both in their present and past research projects, including doctoral dissertations, and in the potentialities of getting new research projects slanted to meet ICA needs. This is also discussed later.

7. The private U. S. foundations and agencies abroad, such as the Ford Foundation, the Friends Service Committee, The Asia Foundation, etc.

8. Private American enterprise, within the U. S. and abroad. Industry committees produce relatively simple materials for consumer consumption which might be a useful level for underdeveloped areas' trade use, e.g., the booklet "Residential Wiring Handbooks," AIA File No. 31-C-61, produced by the U. S. Industry Committee on Interior Wiring Design. Sales catalogs are of great value, as witness the worldwide use of Sweet's series; promotional materials often give useful information; and organizations like Aramco with large training programs abroad have developed materials which might well be used intact and which perhaps could be made available. Personal contacts with American business and industry, especially in the technical branches, can provide a real wealth of materials.

9. A substantial body of material produced by the United Nations and its specialized agencies which could get broader distribution, and be used as source material for ITID publications. Many United Nations reports to governments are prepared with the understanding that the governments may or may not make them public, as they determine. ITID could take the initiative to get at least the American reports declassified, and perhaps could help the same process in other countries. The Food and Agriculture Organization provides special reports to each country to supplement the FAO manuals; these also could be declassified and made available to other countries.

10. The increasing volume of materials produced by EPA, as well as those produced by the separate productivity centers of Europe. Some systematic way ought to be found to make this material readily available in usable form to the underdeveloped areas; the Pool could do this. ECAFE, OAS, the Colombo Plan, and comparable organizations will have increasing quantities of materials which would be similarly useful.

11. Work produced by agencies within specific foreign countries. The Ontario Research Foundation, for example, has developed a ceramics base from rice hulls. It has also found that sulfite liquor waste from wood, when cured properly, makes a good waterproof binder for pressed board. The Office of Development Commissioner for Small Industries in India, to give another example, is starting a technical information unit to produce 200 how-to-do-it booklets on starting new businesses, making certain commodities, etc. These might well have worldwide use, if a central organization like the ITID Pool could get them and study them with such use in mind.

12. In addition to the specific sources mentioned--and there are many more--there remains the whole area of public periodicals and published reports, personal contacts with individuals through school ties

or previous work together, association through clubs and organizations-- the whole complex by which Americans communicate and get things done. If the Pool staff is qualified and applies itself, the potentiality of American technical know-how can much better be made available to the underdeveloped areas.

#### Contracts for Technical Aids Materials

The present operating policy of Technical Aids Branch is to contract out all possible subjects, such as the Technical Inquiry Service or the writing of Plant Performance Reports, and to do as little of such material preparation as possible within its own office. Despite recommendations for the Pool and for an editorial unit within ITID, the SRI team believes the general policy of contracting has proved a good one. The Pool and the editorial unit must be within the ITID office because of their integrated relationships with ITID as a whole, with the Office of Industrial Resources and its specialists, and with the USOMs. However, it might be possible for a contract arrangement to be worked out with OTS to provide the Pool service located in the ITID offices. In any event, and as an operating principle, where the material required is a well-defined unit, preferably of a continuing kind that does not require much of ITID overhead in constant contacts and negotiating, and where it is not beyond the resources of a contractor, it would appear most advantageous for ITID to obtain such materials through contracts.

Specifically, it would appear most logical to continue the OTS contract to provide the answers for the Technical Inquiry Service as at present. (The Technical Inquiry Service is discussed in some detail under "Media" in Part II of this report.)

It may also be worth investigating the policy and practical problems involved in contracting with such agencies as Unesco and FAO to produce manuals. The SRI team understands that FAO, to be specific, can prepare manuals on date processing and packaging, rice processing, silk reeling and weaving, and ramie and kenaf processing. It would, in fact, like to do these, but has no budget presently for them. If ITID judged them useful enough and contracted with FAO personnel to produce them, it would of course be assisting FAO's program while advancing ICA's objectives. (It ought also to be determined, of course, whether FAO could produce them as cheaply as the Pool could, and whether the quality would be higher or lower.)

The universities of America apparently are increasingly interested in contract research, particularly if no confidential relationship is involved, and a growing number of applied research centers are also available. Again, the consideration ought to be whether the project is one which is beyond the capabilities of the Pool in terms of developing information or is a continuing project which need not tie down the Pool on a routine basis if it can be handled as well and as cheaply another way.

#### The Technical Information Officer

The SRI team is convinced that the single most important need in the communication chain of getting technical aids from ICA/W to use in the host countries is the Technical Information Officer. Nowhere in its itinerary did the team find that he exists in clear-cut fashion, although USOM/Philippines approximates the concept. USOM/Italy apparently once had his equivalent, an "industry education officer for productivity promotion." Many Missions have personnel in the Industry Division assigned to handle some parts of the technical aids program--usually films or the technical inquiry service. The latest multilithed "brochure" from TAB, "Industrial Technical Aids Services,"\* in effect suggests that such a position be established if there is no host-country facility for handling the problem. But there seems to be little realization that if a Washington technical aids production and service program is warranted, there is also need for an organized responsibility to see to it that the material gets to the field. This may well be a reflection of uncertainty about basic policy, as mentioned at the beginning of this report: is ICA merely to meet "expressed needs" or is it to motivate, to help guide a host country to the program most useful to it? Technical Aids Branch can operate on an expressed-needs basis, and it may be argued that this is almost how it is generally operating now--taking its guidance from indicated needs from the field, and then providing the materials. However, in the research project represented by this report itself, TAB subscribed to going beyond such an approach; and, as has been indicated in this report, the SRI team has been forced to conclude that a limited policy of waiting for the expressed need would be self-defeating to ICA's purposes.

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\* This publication is undated, and is otherwise difficult to distinguish by title from memoranda and other Technical Aids Branch materials which may have the same or similar titles. This relatively minor but frequent shortcoming is discussed later in the report.

ICA Manual Order 1410.1 provides that "technical divisions may have extension communications specialists to the extent warranted, or may designate a staff member to handle communications matters." What is needed is realization throughout the ICA organization--especially among the officers concerned with industrial development--that the communication of technical information does indeed warrant a specialist in the field. General realization of this may come only when the technical aids service is at such a high volume and level as to make the point painfully clear. However, the SRI team believes TAB will want to establish its utilization channels now, as part of its own program of getting the service to the optimum level. Specifically, it should promote the use of Technical Information Officers in the Missions in the same way OAVS promotes use of Audiovisual Officers.

Need for a Technical Information Officer. The need for a Technical Information Officer to help utilization of present technical aids materials is spelled out on pages 28 to 35 of Technical Aids Branch's "Industrial Technical Aids Services." A thorough job of following out the suggestions therein would itself amount to a full-time assignment.

However, the justification may be put on a more fundamental basis. Communication succeeds only if every link in the chain functions properly, in the simplest, most direct line. In a complex situation, if all the signals must go through a central switchboard, messages can get through only haphazardly when the board is so congested as to frustrate the operator into errors. In the spread of industrial technical information, the USOM Industry Division is the central switchboard. "Messages" from ICA/W must clear through USOM Industry Division for relay to host-country receivers; conversely, "messages" from the host country to ICA/W must channel through USOM Industry Division. Almost literally, this is the switchboard. Yet, without reflection on any Industry Officer, he cannot do the whole job of communicating technical information because he has far too much else to handle, and because he is not supposed to be a communications specialist.

As a result, what should be a dynamic force and a basic tool in a technical assistance program--the technical information itself--often is handled in haphazard fashion, or sometimes is simply filed away. It may be said that the whole process of the Industry Division is technical assistance, and thus technical information. However, the situation would appear analogous to a large hotel restaurant, in which a manager is responsible for running that restaurant to match the quality of the rest of the hotel: he is so busy with VIPs, with settling the menus, ordering the food, paying the bills, arranging for music, and handling the decor,

and is so beset with personnel problems that he has decided he has more important things to do than to try to find the money to hire waiters to serve the food. Certainly it is pertinent for ICA to pay close attention to the serving of its food, for technical assistance is a major part of its menu.

There are now at least six possible major ways by which technical information can be communicated to the ultimate user:

1. Assume that private commercial channels are doing all that is desired, on the theory that if there were a bigger market, the profit motive and the law of supply and demand would soon enough involve private enterprise. Unfortunately, there are many reasons why this theory does not hold true, although the SRI team recommends that far more be done to use this channel. Trade barriers and the need for education and stimulation at a more basic level to provide enough demand to warrant the high expenditures for the "tooling-up" stage combine to make the private-enterprise view somewhat invalid in an underdeveloped area.

2. Make the material available, perhaps in the U. S. Embassy if ICA is really not so much involved, on the theory that anyone who needs information will come and get it. This theory fails because too few people would even know about the availability of the information, fewer would really understand their own needs enough to seek it, and still fewer--at least in some countries--would feel free to walk into an American office and ask for help.

3. Send the material to the host government and let it distribute the material. Sometimes this works, in countries which have active productivity or technical information centers, although not all people like to go to their own governments either. However, for those countries that do not have centers, should ICA help develop one, or otherwise teach a host government how to use communication techniques? Even where there is a center, there is no guarantee that it is a good one or will grow into complete effectiveness; should ICA put all its eggs in that one basket?

4. Contact private channels and users of technical information--trade associations, individual manufacturers, mass media for popularized materials, trade and professional journals, if any. There is a large opportunity here, as will be shown--but this takes trained personnel within ICA, specifically assigned to the task.

5. Furnish the material to the United Nations or one of its specialized agencies, or to private agencies operating in the field, and

let them reach the consumer. The SRI team feels that this is excellent, as far as the resources of these agencies go, but they appear far from adequate to handle the task, even if U. S. purposes and policies would allow complete reliance upon such an approach.

6. Furnish the material to U. S. technicians in the field for their own information, to "filter down" to ultimate consumers. This is what often happens now, but it is hardly adequate to the needs or opportunities.

Thus there are these several basic dissemination courses through which a USOM Industry Officer can go as far as desirable in conveying technical aids to potential users. At present he usually does not go very far. In one important Mission, the team was told, "The materials came in unrequested, and we weren't staffed and didn't have a program, so they got kicked around." In some places, it was obvious that most of the materials were simply filed. In most places there was an apparently sincere desire to disseminate the technical information, but the question was always how, in view of the priority of other matters. The fact that dissemination of information is difficult in an underdeveloped area makes the problem that much harder to start tackling. Mail is poor, good mailing lists are hard to secure, associations are often yet to be formed, there are almost no free libraries and even fewer people accustomed to using them. So the dissemination job does not get done as well or as quickly as it should be.

The fact is not overlooked that in the OAVS there does exist a communications channel. The problem here is simply that the Industry Division does not really have adequate use of this channel, for two reasons. First, the Audiovisual Officer in the Mission is sometimes assigned to a specific project or subject-matter group and is not available to the Industry Division; when he is available, it is mostly in theory, because the Audiovisual Officer is understandably so busy with pressing matters that he does not ordinarily seek out the Industry Division to see what service he can render. Second, the Industry Division is so busy with its presumably more important affairs that it does not seek out the Audiovisual Officer to ask for help; this is partly because Industry does not really understand the value of the help that is potentially available, which is to say it needs "motivation," just as any other communication receiver in the underdeveloped areas. The underlying reason is that for a communication man to serve an organization most effectively, he must be part of it, must have an insider's access to the ideas, confidences, and materials of the organization in order to understand its problems and policies, and to fit into the organization and help it run smoothly--instead of being someone whose orbit coincides upon occasion. By the very definition of his duties, the Audiovisual Officer simply cannot be expected to be part of the Industry Division in this sense.

For the foregoing reasons it is apparent that a Technical Information Officer of some kind must be assigned to the Industry Division if that division is to do its job adequately, and if the materials provided by TAB are to be used.

This report does not intend to imply that this is a new idea with the SRI team. On the contrary, it is understood to be part of present TAB planning, and there are many evidences in the Missions visited that the necessity is becoming clear to Industry Officers. They are, in fact, assigning personnel increasingly to meet the problem. This report seeks to formalize and speed this process by putting the problem and solution in perspective and focus. Specifically, it involves the recommendation that ITID would have responsibilities for developing and backstopping such officers in the same way OAVS serves the Audiovisual Officers.

The Role of the Technical Information Officer. The Technical Information Officer, it is clear, must be a regular staff member of the subject-matter line division in a Mission--the Industry Division, for purposes of this report. His title should reflect his full function as much as possible, and thus "Industrial Technical Information Officer" is recommended. One Industry Officer felt this title would hamper the function, and suggested "Industrial Publications Officer" instead. Other possible titles are: Assistant to the Industry Officer, Media Officer, and Industrial Liaison Officer. All of these would seem to have drawbacks of their own, and as it would probably become in ordinary usage, "the Industry TIO" would seem simplest and most descriptive. There is a precedent for "Technical Information Officer" in the U. S. government, through use of the title "Public Information Officer," or PIO. By contrast to PIO, use of the TIO could eventually focus due attention on an increasingly important specialist in technical assistance programs, and would make clear that it is not a public information, or public relations, function.

The SRI team believes it is important to stress this point. There is no objection to having the public relations function served. On the contrary, the team feels that good public relations is essential to the success of the ICA program. (No recommendations are made on this matter, because it is outside the province of the report.) Furthermore, what every staff member does is in a way public relations, and a staff member who would deal with the host-country government and people as much as the Technical Information Officer would be serving the public relations program of ICA at all times.

The distinction must be kept, however, that the TIO would be doing this only through his regular function of helping the flow of technical information. He would not be the officer who entertains VIPs, even though it might be a temptation to so assign him. He would not produce the "annual reports" which are really institutional promotional pieces, although he might well produce a promotional piece to stimulate interest in a specific medium or series of technical aids available from ITID. He would not be the liaison with USIS to spread the story of what ICA is doing, from a public relations point of view, although he would work closely with USIS to use its channels for stimulating interest in technical information.

The reasons for insisting on this distinction have been stated in another connection, but bear repeating. They are two: First, the team observed that where someone had corollary public relations duties, or almost any duties, in conjunction with a service function that could be put off when something "urgent" came along, there was such pressure to do the "urgent" jobs that the regular service job suffered greatly. As has been noted, the functions of the Audiovisual Officer have been seriously affected in this way. All the more because the logic and temptation will be great to make the TIO also a PIO, it must be resisted from the start--if there is to be a real technical information program. Second, the official helping mass communications people with their problems should not also be in contact with them for public relations purposes, lest the conclusion be drawn that his technical assistance activities are merely leverage for "propaganda" efforts.

For the same reasons, and particularly the first, the TIO should not have line responsibility for the development of host-country technical information institutes, productivity centers, or extension services. He would certainly stimulate their creation and development, perhaps even taking the initiative to the point where a project is proposed. But at that point, someone else should take over. If the TIO gets too directly involved in starting or operating a productivity center, his other work will suffer in the same way that audiovisual service to the Mission as a whole is greatly curtailed when the Audiovisual Officer gets directly involved in starting a host-country audiovisual center.

The professional qualifications of the TIO are somewhat complex. He must be an engineer or in some other way have developed the industrial know-how to work well at all levels with industrial technical information, and to understand the needs of various industries as well as the opportunities for applying a technique from one industry to another. He must certainly also be a man who thoroughly understands the communications techniques. Above all, he must be "simpatico," dedicated to his mission.

There are such people, but they are not easily found, and ITID most likely will have to undertake a vigorous program to find and perhaps train such personnel. Certainly it is to be hoped that a TIO-staffing program would not be achieved simply by taking the least-busy man now assigned to a USOM division.

Functions of the Industrial Technical Information Officer. The Industry Technical Information Officer's specific usefulness will become more obvious from a listing of possible functions he might perform, depending on local conditions:\*

1. Specifically, he would stimulate utilization of the materials made available by the Technical Aids Branch, in all the ways suggested on page 28 of the pamphlet, "Industrial Technical Aids Services."
2. He would be the liaison with the Audiovisual Officer, understanding both the Industry Division's problems and audiovisual techniques, so that the Industry Division would get its full share of that facility.
3. He would be a liaison with the technical information personnel of other subject-matter divisions, to coordinate efforts and prevent overlap or confusion by issuance of conflicting information. Among the divisions in which overlap with industrial information is not only possible but probable are Community Development, Labor, Agriculture, Education, and Public Administration.
4. He would be the liaison with international technical information agencies operating in the same or overlapping fields. An instance of such overlap is in Bombay, where ILO has a Productivity Center working with the Indian Ministry of Labour, while the Ministry of Commerce and Industry has a Small Industry Service Institute in the same city.
5. He would work with other divisions to stimulate the development of channels of communication in the host countries.
6. Specifically, he would do the groundwork to initiate a project for establishing a technical information center or productivity center in

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\* If the recommendation for Coordinator of Communication Programs is adopted, the USOM Technical Information Officer would operate within the framework of the coordinated over-all program in following the duties shown.

the host country (although he should not be the line officer in charge of that project once it is established).

7. He would "backstop" productivity center activities and personnel.

8. He would stimulate the establishment of private channels for the spread of technical information (see "Private Channels," below).

9. He would be responsible for final Mission handling of Technical Inquiry Service questions--sometimes helping compose the letters, applying policy controls, furnishing background information required by TAB and OTS for the proper answer and for judging the amount of time to devote to the matter. (This is discussed under the Technical Inquiry Service, in "Media," in Part II.)

10. By his breadth of informational contacts, he would provide a kind of local "pool" of information and personnel which can be consulted for answers and thus avoid the expense and delays of going to OTS or bringing in professional consultants.

11. He would be the center of feedback functions on industrial technical information. He would keep the necessary records of evaluation and research. He would forward to ITID suggested subjects for media materials needed, making it part of his daily business to watch for them. He would also forward samples of technical aids materials produced by the Mission, by host-country agencies, and by such organizations as other bilateral and multilateral technical assistance missions, for the use and information of ICA/W. He would send ICA/W photos, etc., for publication and exhibits.

12. He would work with industry specialists to find and serve their particular needs, thus saving them time and trouble.

13. Industry division materials sometimes can better be handed out by a specialist in another division, because of personal contacts, delicate political situations, or the level involved (e.g., a pamphlet designed for foremen may reach them better if the Labor Officer delivers it rather than if the Industry Division passes it down through the company presidents). The Technical Information Officer would find such cases and would arrange for proper handling.

14. Sometimes, as the SRI team observed, one exceptionally gifted and aggressive specialist--say in materials handling--can promote his

program so vigorously that it seems to overbalance the whole industry program. The Technical Information Officer would do much to equalize the program without impairing the good work of the zealous specialist.

15. He would help unblock local channels of communication of technical information. If an archaic law so constricted the use of libraries that they must remain locked-up places unable to serve users, he would work with the Public Administration Division (and possibly USIS, in this case) to improve this situation.

16. He would be the Industry Division Officer specifically concerned with establishing local communications facilities, publications, and services by stimulating projects which other division personnel would manage.

17. He would work with USIS on industry division programs, but he should not be the liaison from a public relations viewpoint. He would work to advance the flow of technical information, not to explain the over-all ICA program to the public.

18. He would work with the mass media--especially newspapers and magazines. It would not be a matter, as in the USIS function, of getting credit for the United States; it would be rather to stimulate further development, through emulation of success stories, through popularized series of how-to-do-it articles, to educate the mass public on simple technical subjects and thus create the "climate" for development.

19. He would "educate" the other subject-matter divisions as to the extent that industry and industrial technical information are part of their operations. The community development program is a conspicuous example; labor and education are others. He would operate to keep them "inspired" on the subject.

20. He would make certain that the Mission staff as a whole was regularly aware of the technical aids program and how it could be of use to them. He would issue TAB catalogs to key offices (the catalog is discussed under "Media"), make reports at staff meetings, see to the delivery of appropriate materials to the desks concerned when they arrive from TAB, plant articles in the Mission house organ, help TAB plant articles in the house organs of other divisions and in ICA's house organ.

21. He would help to arrange that industrial communication people were among the participant "teams" sent from host countries to the U. S., and he would work with all returned participants to develop their reports and help spread the technical information which they themselves received.

22. He would be responsible for the "localizing" of prototype technical aids materials which come from TAB (discussed below), until such time as the host country handled such matters.

23. He would help with the local handling of specific TAB materials: e.g., organizing vans as an industrial exhibit service on the basis of blueprints and suggestions from TAB.

24. He would find local ways to use TAB materials to meet a particular policy, attitude, or interest current in the host country. For instance, when the SRI team was in Turkey, the prime effort there was to find how to produce more goods without importing more equipment. This was the common objective to which everything had to be slanted, to insure best success.

25. He would develop a list of contacts--including a mailing list--of use not only to his own function but to the Industry Division and the USOM as a whole.

26. He would "exploit" local successes to stimulate others in the country to do the same: once a pilot plant is set up, a simple pamphlet to show other possible entrepreneurs what can be done, or a film of an unusual local project, could be issued.

27. He would get materials from other USOM divisions and other sources for the use of industry division specialists.

28. He would coordinate the promotion and the presentation of films, exhibits, etc. (In the European program, the SRI team was told, utilization teams were on hand to stimulate the showing of films before there were any films available to show. The Technical Information Officer could avoid this.)

#### The Audiovisual Service as a Channel

In the list of possible channels for disseminating industrial technical information, the OAVS and the Audiovisual Officers in the Missions deserve a high place. Their activities can cut across all the line subject-matter operations and they may perform a most useful function in helping the interbreeding of the subjects. The "Multiplier" (the OAVS combination house organ and training manual) now has somewhat irregular but broad distribution to the various subject-matter divisions, including industry. It often contains materials of direct interest to industrial specialists. Although the particular developments reported (The

Chula pamphlets in India, especially "Smokeless Kitchens for the Millions," page 20, issue No. 11, are a good case in point) would presumably be handled through the Industrial Technical Information Pool and the ITID house organ, there would still be great value in "feeding" to the Multiplier such items as would serve ICA by making them known to the whole ICA internal communications network reached by the audiovisual service people.

All of this, of course, is in addition to the direct service the Audiovisual Officer could perform for the Industry Division, especially if there were an Industry TIO to utilize this resource.

#### Industrial Technical Institutes and Productivity Centers

From a long-range point of view, it appears imperative to establish some kind of organization to handle industrial technical information in an underdeveloped country. The exact form which such an institution might take is detailed in the Technical Aids Branch publication, "Activities and Institutions of the Industrial Technical Cooperation Program," preliminary draft edition, October 1955. This manual is discussed in some detail under "Media." It would seem clear, however, that the institution often is an outgrowth of the technical information services offered by ICA. The European productivity centers were such an outgrowth, and the pattern is being repeated in the other areas of the world.

The development of technical institutes and centers is to be encouraged, for a number of reasons:

1. It transfers the technical information activity to the host country under the best possible circumstances, allowing for training of counterparts and the assistance of ICA through formative stages.
2. It insures, as far as possible, that the activity will become a permanent one, and that the host country will have a source of increased industrial technical information as technological development advances.
3. It provides the agency which can adapt prototypes and other media.
4. It helps build the entire communication complex of the country by developing professional personnel (many of whom advance into other jobs), and by stimulating

professional and trade organizations. It also performs a valuable function in setting standards for information service, for quality of publications, and for techniques because they are often the models by which other communication activities begin and advance.

It is important, therefore, for ITID to help in the development of these institutes or centers in every way possible. The manual just referred to is one way; the development of the Industry TIO program will be an even more tangible contribution, particularly as men are trained for the specific function of working on ICA projects to develop such institutes or centers. ITID should arrange to provide technical information services for these centers, through the TIOs and the Pool. The two-way flow between the Pool and the center will in itself stimulate the growth of the center.

The first step in the establishment of such a center, in countries where one does not exist, is to provide an increasing amount of industrial technical information to the host government; with or without ICA prompting, it will soon become apparent that some organized way must be found to handle this service. The TIO is especially helpful here.

One possibility which ICA should keep in mind, as these national centers develop, is the establishment of some sort of international association of centers, to trade their findings and techniques, and to work out joint projects. This is discussed under "Regional Channels," to follow.

#### Research Institutes

Applied industrial research is practically a necessity for the underdeveloped countries. At present most of this research is being furnished by ICA and the other international agencies, and this support may have to be continued for some time. Nevertheless, the sooner the host country can begin developing its own answers on the basis of its own particular conditions, backstopped by the general world store of technical know-how, the sooner the country will be taking its full place in the technological picture.

If at all practicable under local political conditions, this research activity should be associated with an industrial technical institute, for the following reasons:

1. It would indicate to local businessmen that the institute is a practical, not a theoretical, service--and, of course, it actually would be so, because of the experts on hand to solve problems.
2. It would indicate that the institute is handing out "local" information, not material "over their heads because it comes from the United States." (Even if 95 percent of the information furnished by the institute came directly from the United States, any one answer would not need to give an indication of that dependence.)
3. It would avoid duplication of library and reference services.
4. If research is on a paying basis, it might even be a way to pay for the information-disseminating function of the institute.
5. It would make the institute a tangible entity, a facility with laboratories, experts, and work in progress, as distinct from what might otherwise be a few unimpressive office rooms and a product no more impressive than some shelves of pamphlets to be handed out. This would be of service in impressing local industrialists to use the institute, and the government to appropriate the necessary budget funds.
6. The institute would serve as a feedback to the research unit, to assess more accurately what kinds of research are really needed.
7. It would stimulate the research unit to faster and better work because the researchers would see immediate results, since the information unit would be publishing them and industry would be using them.
8. It would contribute to the communication complex of the country by developing relatively advanced techniques for disseminating research results, and it would be training people (by their dealings with the communication people in the information unit) to think about their work in terms of communicating about it.

9. The research people would have an easy way to find out through established communication channels available to the institutes--e.g., the ICA Pool--what research has already been done elsewhere on the problem at hand. There seems to be a current tendency for research organizations in underdeveloped areas to start in at the beginning on a problem, without first getting available data. Yet often they might be saved the entire job, because there is a good deal of similarity among certain of the projects undertaken in underdeveloped countries, such as in the fields of basic ceramics, metal-working, woodworking, and textiles.

It is highly desirable, therefore, for technical aids materials to be made available to research activities. This would involve reference libraries, professional and technical journals, access to the Pool, and to the Technical Inquiry Service. An Industry TIO available in a Mission to contact this research unit would not only be able to help, he would also increasingly get materials which he would feed back to the Pool for worldwide use.

#### Media Production Centers and Schools

One of the characteristics of the communication complex in underdeveloped areas is the difficulty of obtaining adequate graphics production--printing, still photography, films, artwork, layout--and editorial work. While it is therefore a matter to be treated as part of the whole approach to developing the communication complex, ICA has a special interest in an early solution to the problem of getting its own technical information materials properly produced, and of helping the host government do likewise with its increasing quantities of technical materials.

The specific problems which must be met are:

1. Selecting the proper medium for the particular message. Often much money and effort are wasted in producing too elaborate a training aid--making a film when a poster would have served better, for instance.
2. Designing the particular training aid to insure its best utilization, spending neither too much nor too little money on it, because either way the original investment is jeopardized.

3. Getting the training aid produced as desired and when needed. Without this, again, the original investment is jeopardized, and the opportunity for which the training aid was intended is lost.

The solution, as many countries are finding it, is some sort of media production center. Here are assembled host-country specialists (or specialists-in-training) with American counterparts to provide a graphics service to government agencies, and to begin the process of spreading graphics techniques to those interested throughout the country. The exact form such a center takes is beyond the scope of this report, but inasmuch as the utilization of the entire ITID prototype program may depend upon the availability of a good media production center, it is of interest to ITID to stimulate the development of such channels. As it stands, the Audiovisual Officer in a Mission usually takes the initiative to get such a center started. Under the recommendation in this report, the stimulus probably would come from the Mission Coordinator for Communication Programs, and the project might be set up under the Public Administration, Education, Community Development, or Industry Division, one of them separately or all of them jointly. In the absence of a Coordinator of Communication Programs, the TIO would have an interest in developing such a resource. In any event, ITID should promote such projects from ICA/W and should produce materials to help such a center.

In the same way there is need for support for training centers--perhaps regional--for training of publishers, editors, commercial artists, printing production men, photographers and other graphic-communication people. In the absence of a set-up to take initiative for development of the communication complex as a whole, ITID again should join with OAVS in assuming responsibility for getting such projects started.

#### Industrial Extension Services

It is becoming increasingly clear in the underdeveloped areas that some sort of industrial extension service is needed if there is to be any substantial and lasting progress in improving the whole industrial complex.

There are several reasons for this view:

1. In an underdeveloped area, the industrial complex includes thousands (and in India perhaps millions) of one-man shops in villages which may not even be accessible by road.

These men will not come to schools, for good economic reasons; they cannot travel far, even for exhibits; and in any case they need motivating to find the interest to come at all. These people must be sought out, almost one by one, to be helped.

2. It is a stubborn fact that in some countries the castes and unions are so strong in their respective fields that school-trained men trying to join the work force from the outside will be resisted, and that in-service training is the only way to improve the skills of the existing labor force. A good extension service is necessary to develop any substantial in-service training programs in these areas.
3. There is a tendency for people to let things slip, to go back to old ways even though they have been trained in the new, and have seen its value. The extension service is needed to provide the follow-up which insures the lasting benefit of all the time and effort spent in the original training or development.
4. While not in itself a compelling reason for an extension service, a decided advantage is that the extension service provides the feedback which can be of help all the way up the chain of communication to ITID, to shape the technical information in the way it can be of most practical service to the field. Without such a grassroots contact, in areas which cannot communicate well, it is altogether likely that unsatisfactory information programs can be offered for long periods without their inadequacies showing up.

So many extension workers are needed that it might seem impossible to get them in areas which are being helped by ICA, precisely because there are not enough persons with the technological skills or know-how needed to fill such a job. While one cannot be unduly optimistic about solving the problem, it is at least clear that ITID and the USOM Industry Division--probably through the TIO--could shape a technical aids program to help train industrial extension workers and to get for them the training aids they will need on the job.\*

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\* One specific suggestion for a source of extension workers came from Homayoun Sarati, Manager of the Franklin Publications office in Tehran: get university students to do social work in the summer. Said Mr. Sarati, "There are 5,000 students in Tehran, mostly from the provinces and villages, and mostly sons of landlords. They can change the country in ten years."

Industrial extension services do exist, in various stages of development, and they are quite varied in the basis of their operations. Some are part of the school system, some are functions of the Ministry of Commerce and Industry, some are part of independent development agencies, some are attached directly to a technical institute, and some to research institutes. In Indonesia, at least until recently (there was a move underway to correct this), the extension service was not only part of the Ministry of Commerce and Industry but was also performing specific regulatory, licensing, and policing functions which made it difficult for the extension officers to be accepted fully as helpful friends who could be told all the inner workings of a firm as a basis for further recommendation.

The specific determination for any country as to where the extension service should be based is beyond the scope of this report. The details as to how such a service should be started and how it should operate are properly part of a USOM industry project. But there are general implications for an industrial technical information program, with a direct bearing upon ITID, in at least these respects:

1. Extension workers will have to be trained; ITID can be of great service in providing materials for the training centers. For instance, the government of India is now developing four regional small-industry centers, and may obtain funds for perhaps a dozen subcenters, to train extension workers (and perhaps grant credits to small-industry people). "If ICA can suggest how to supply the training materials," the SRI team was told, "it will perhaps be a way in which ICA can be accepted to help with the project."

2. Special, highly-portable and simply-used training materials should be developed for the use of the extension workers. The cheap, light plastic three-dimensional film-card viewer is an ideal example, because of its extreme portability, freedom from worries about electricity and darkened rooms, expendability, and special value for individual showings or small groups (as contrasted with the problem of showing a film, for instance). The extension people will need also a handy library of booklets to meet quick questions in the field, a library which probably will have to be designed specifically for them. They would be helped by an ITID catalog of industry information materials in some detail, showing in presentable form the array of materials which their "customers" might need, and which the extension officer could then obtain for them. The extension workers need small-sized flip-charts for showing to one or just a few people at a time. They will need samples of certain products, perhaps good and bad, for comparative purposes--as for example, good and bad bricks.

3. The whole area of training (or, less formally, passing along new ideas and technical information) by movable exhibits can be expanded greatly. If the small plant operator will not, or cannot, come to the exhibit, then the exhibit should be brought to him (this is dealt with in detail under "Media").

4. Simplified techniques for in-service training will have to be developed to meet such problems as: (a) the reluctance of management to undertake such programs, (b) the difficulties of finding capable instructors for the many classes which could be in session at any one time, and (c) the providing of training materials to the students which are at their level and which overcome the language and cultural "barriers."

Media, materials, and subjects useful for meeting these problems are included in later sections of this report. Exhibits, displays, and demonstrations will be particularly pertinent in this respect.

#### Returning Participants

The "Type 1 Participant"--the host-country national who is brought to the United States to observe, study, and train in technological fields--can be a "one-man extension service" when he returns to his native land, if ITID and the TIO can take certain steps:

1. He can be given training by the TIO in advance of his trip, to help him better to observe the technical processes involved, to keep notes, to take photographs (especially color slides), in addition to the best possible orientation to make his whole visit more pleasant and meaningful.
2. While he is in the U. S., he should have an opportunity to get an adequate collection of materials to take back with him, and he should if at all possible be in touch with ITID to get a feeling for the industrial information resources which are available to him through the TIO when he returns. ITID might well prepare specific materials for such participants.
3. When the participant returns home, the TIO--probably through a regular program--should contact him to help him prepare reports, to develop speaking engagements, to work out slide lectures, etc., and to assure him that the TIO will backstop him further if needed.

This may seem to be a great deal of effort to expend on just a few individuals. However, much depends on their attitudes and actions when they return, particularly in countries from which few persons have traveled abroad. They can be of great influence in spreading the conviction of technical information--in getting other people to use the knowledge they have brought back--just as they may also be in the political sphere of assuring friends that Americans really are human beings. It would seem to be good economics to spend perhaps a few hundred dollars to multiply many times the several thousands of dollars cost of one man's trip.

The SRI team was fortunate to meet, in several countries, participants who had returned from trips to the United States and who were enthusiastically spreading helpful information to their countrymen.

### Radio and Television

In the United States, of course, radio and television are basically private channels of communication. Even so, there is considerable government control. In the underdeveloped areas of the world, at least for the foreseeable future, it appears that radio and television will be largely developed, owned, and operated by the governments. Helping a strong central government develop and control these important channels of communication may create a threat to democratic principles by the possible misuse of the media, and may appear contradictory to the basic ICA purpose of strengthening democracy; yet, on the balance, it is worth the risk. Radio and television constitute a mass audience "extension service," and they can help speed the over-all development of an underdeveloped country in so many ways that they are worth every practicable effort ICA can make.

Radio. The uses of radio as noted by the SRI team are:

1. Government ministries use it to explain their programs to the public and to promote their projects.
2. It is used as a channel for news and important announcements, and broadens the radius in which people can communicate and grow into a unity.
3. Specifically, it is a channel for news coverage that emphasizes technological development and thus creates the climate for progress. Even its entertainment programs further the understanding of a technological society.

4. Radio can advance particular technical assistance programs by announcing demonstrations, films, lecturers, etc., and by explaining forthcoming projects. (In epidemics, for instance, the health department can explain the value of inoculations and announce the service; Iran achieved a 99 percent inoculation after using radio intensively, and although the whole result can hardly be attributed to radio, there is no doubt that it was a potent force.)
5. Radio can provide simple instruction in basic principles of a widespread industry--e.g., a program for carpenters can pass along worthwhile technical information.
6. Radio can facilitate motivation, to the whole population and to selected industries, to achieve acceptance of new ways.
7. Radio music helps production in factories, and can be interspersed with safety messages and the like, in lieu of "commercials."
8. Radio can be utilized as an "audiovisual aid" to help the formal learning process in schools, and can serve such less formal groups as "clubs" which may form to hear a regular series of lectures as the basis for discussion.

Two major problems must be taken into account in using radio for technical information programs. First, transmitter and receiver equipment is hardly as prevalent as in the United States, and in a country like India, only 30 percent of some 550,000 villages now have even one radio receiver each. Second, there is strong competition for program time on the transmitters, and allocations of good periods of the day may be difficult to obtain.

Insofar as the physical problem of transmitters and receivers is concerned, ICA can be helpful by improving facilities through its communications complex development, such as extending electrification\* and finding ways to produce cheap batteries and cheap receivers, as well as

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\* India has approximately 28,000 villages now electrified, and electricity is reaching more villages at the rate of 4,500 a year--which would take more than 100 years to be complete.

more transmitters. If developing a new kind of plow represents a technological advance, so also does the development of a cheap radio. ICA, through ITID or OAVS initiative, could work with American radio manufacturers or their associations to find the right answer. (An American answer would not only meet the need but would have beneficial side effects for American industry.) Also ITID could give due attention to technical aids materials which would stimulate know-how on radio equipment in the underdeveloped areas: plant requirement data, for instance, and technical manuals, as well as more basic electronics training materials.

Insofar as programming problems are concerned, there are at least two specific contributions which ITID could make. One would be a manual on using radio for disseminating technical information in underdeveloped areas (part of a series worked out with OAVS for the use of both Audio-visual Officers and TIOs--see discussion under "Media"). The other would be the development of prototype programs for local adaptation. But in radio as in most other communications media, it is necessary in the underdeveloped areas to produce programs locally, to fit into the local context and to serve local needs. Well-produced programs, demonstrably useful to the host country's total development effort, have a good chance of getting on the air; in the absence of host-country radio people in an industrial institute, the Mission ITIO can help the development and broadcast of good programs.

Television. TV is not just an academic subject in the underdeveloped areas: stations now operate, for instance, in Bangkok and Manila; Beirut and Baghdad will have TV soon, as may Cairo, and there is serious talk about it in Indonesia.

The foregoing observations regarding radio also apply in general to TV. While the range of television stations limits reception to metropolitan areas, this still can reach a substantial proportion of both large and small industry, since they often cluster around the major cities. There is every reason to believe that the ultimate impact of TV will be much greater than that of radio, as in the United States and Europe.

Television is equivalent to film, in many ways, and where reception is possible, it seems to be better because it can be shown on a regular schedule and can be received more simply (turning a switch as against darkening a room and setting up and operating a projector). Closed circuit television, with the same advantages, may be useful in special situations where there is no transmitting station or where the time required cannot be allocated. Since the "nuisance" of setting up film showings limits the use of film, TV may make a substantial difference in utilization of training aids.

Even more than radio, TV requires a supporting electronics industry, for installation and for maintenance. ITID can be helpful, especially through the ITIO, in disseminating technical aids to develop this industry.

In terms of TV programming, again there must be reliance on the ITIO and local resources. However, the whole library of films is a potential resource (once films are legally cleared for television showing) and the value of a film collection can be increased many times by proper utilization of TV. Furthermore, as the number of TV receivers around the world increases, ITID will be warranted in developing prototype materials especially for this medium.

While it is difficult to predict how soon magnetic tape recordings will be generally available for television (the first major equipment is being installed in U. S. television stations now), the day is coming when it will be almost as cheap and simple to make a "film" on tape as it now is to make a sound tape-recording. The relative simplicity of using TV instead of film projection has already been mentioned; in the long run the TV tape may well supplant the ordinary film for most purposes except theater presentations. This is a development which ICA will have to watch in terms of procurement for film projects.

#### Community Development

The most pervasive extension service, in those countries in which it exists or is being started, is the community development program. India, the prime example, is planning to staff 100,000 "village workers" in the next seven years. These are men who are not necessarily very well educated, but who will be trained to help their village improve its well-being by the whole combination of projects that make up a community: health and sanitation, agriculture and food processing, simple technology, education. At the higher levels of ICA planning and even host-country operation, these are perforce separate matters, but when they reach the village level they blend into one.

Materials for these village workers almost certainly must be developed within the community development organization. But that organization relies on experts at all levels and in all fields. The TIO is an ideal source of the industrial technical information needed among the prototype material to be provided by ITID; a flexible and imaginative TIO may find parts or even whole media that can be used almost intact by the community development organization. This will be all the more true if ITID bears in mind the vast potential audience it can reach through community development channels, and aims as much of its material as possible at that level.

### Literacy Movements

One of the besetting problems facing the literacy movements is the lack of reading matter for the newly-literate person. When he does not have meaningful material at the very elementary level required, he simply does not read--all his learning process up to that point is in vain. Furthermore, the general knowlddge that there is nothing to read at that point has a deterrent effect on other persons who might otherwise be motivated to learn to read.

There is an opportunity here to provide two kinds of reading materials which would serve the technological advance:

1. General subjects slanted to provide the attitudes, the basic understandings, the values required to become part of a technological society and help sustain it.
2. Specific simple manuals in various trades and processes. ITID could provide prototype materials which could be adapted to local conditions in the field by the literacy movement staff itself, by the ITIO, by an industrial technical center, or perhaps by the school system. Where warranted, the actual mass production of such materials for a given country or area might be an ICA project.

The ICA personnel jointly encouraging the development of the communications complex might consider how the literacy cause could be furthered by the provision of a paper mill to provide a cheap printing paper supply.

### The School System

While there is some difficulty in drawing a line between the purviews of the Education Division and the Industry Division where they tend to overlap on such matters as vocational training, there can be no doubt that the schools are an extremely important channel for the spread of industrial technical information.

Some case can be made, in fact, for assigning the schools a major responsibility for disseminating nearly the whole range of technical information. In the Philippines, the public schools have a small-industries operation in large-scale production, making goods for export. This and other projects by the schools around the world have been justified along the following lines:

1. The schools can achieve motivation among adults because they can use the children to convince their parents, and because the school is almost always the one accepted institution in a nation.
2. The schools are already organized--perhaps the one fully-operating organization in the country--and they can guarantee continuity to the program, can carry on after the U. S. Mission leaves.
3. The teachers already know the techniques of "seeding work"--of teaching their students to train others.
4. There are a relatively great number of teachers compared to the few technicians (90,000 teachers in the Philippines for instance, versus 1,000 extension workers in agricultural and other fields).
5. The schools reach nearly all the people, not only a cross section.
6. The understanding of technical information can be integrated with the schools' basic function--teaching the "three R's."

These are strong reasons, and while they do not take into account the advantages of approaching industrial learning from the management and labor points of view directly, they are nevertheless listed here to reinforce what should be a fundamental principle: the Education and Industry Divisions in the Missions should work much more closely than the team found them working on the project trip, and ITID should work more closely with the Education Division in ICA/W. Here the ITIO can be of great practical usefulness, and with the feedback from the Missions, ITID can provide prototype materials which will use the resources of the schools more fully to improve the technological climate and develop higher technical skills.

#### The Universities

At the other end of the school system, the universities and colleges also offer an important channel for technical information. It should be remembered that in the United States, the very successful agricultural extension service was linked to the universities. There are some movements in this direction in the industrial field in

underdeveloped areas, and technical schools are specifically suggested in ICA's pamphlet, "Industrial Technical Aids Services," as one kind of agency which can handle the utilization of Technical Aids Branch materials.

Furthermore, President Eisenhower's recent suggestion that the universities and foundations can mount a major technical assistance program raises interesting possibilities and policy questions vis-a-vis ICA and such operations as the Technical Aids Branch.

It is perhaps too early to be setting general principles for such an operation, but it is nevertheless clear that if each university had to develop the whole range of industrial technical aids by its own resources, there would be just as much waste as if each USOM had to do it. There probably would be an inclination for each institution to develop its own, to experiment, and to avoid a stereotyped approach. Nevertheless, when activities reached a major scale, some such agency as ITID (especially with an information "pool" of some kind) would be so economical and efficient compared with the separate-institution approach, that it almost certainly would have to be developed. As will be noted in more detail later, ITID perhaps should be so constituted that it could move intact, if the contingency should prove useful. It might well be that if the university technical assistance program became America's primary effort and ICA withdrew from the field, ITID would be the nucleus of an inter-university operation.

#### D. Regional Operations For Technical Aids

The Technical Aids Branch instructed the SRI team to pay particular attention to the feasibility of ICA regional centers of some kind for the production and/or dissemination of technical aids.

The findings of the team are that with the partial exception of the Arab States (and Latin America, which was outside the scope of the project trip) it would not be feasible to set up regional centers as such (see accompanying map). The controlling reasons are these:

1. Cultural, language, social, and economic differences make it necessary to localize materials to each country, or sometimes even to an area within a country, when those materials involve motivational aspects of any kind and when the technical level is low. Hence the recommendations herein of prototypes, TIOs, and local production facilities. When these factors do not control, materials in English from Washington would appear satisfactory enough to make unnecessary the regional setups. Prototypes for local adaptation can be made adequately



in Washington to serve all areas generally; at least prototypes tailored at the regional level for adapting locally would not be enough better to warrant the duplication of effort among the various regional centers and the necessity of close backstopping from Washington to furnish them the basic materials.

2. In terms of production facilities and economy, it would seem better to make the operation of producing technical aid itself part of the process of developing the underdeveloped areas' communication complex--especially since most media would have to be changed so much for each country that there could be no real economy of joint production.

The one partial exception, the Arab States, provides a possible basis for a regional center, because there is a common written language, "newspaper Arabic," which is considered not ideal but adequate. Even in Arabic, however, the spoken dialects vary enough from country to country to require separate sound tracks on films. There are political differences which divide the Arab peoples, at least on some matters, and to some extent apparently their customs diverge.

However, the SRI team believes the possibility warrants the establishment of a regional center on an experimental basis. If it were established in Beirut, using existing production facilities by and large, there would be no great loss if the operation were later abandoned; and meanwhile there would at least have been impetus to the communication complex in Beirut. The advantage of the experiment is that in such matters as the dissemination of technical information, it is well not to be too dogmatic--and an empirical test may demonstrate values and uses for a regional center beyond any reasonable prediction.

There are three other regional aspects which the SRI team believes also warrant consideration: (a) traveling regional representatives of ITID, (b) special liaison with existing international regional organizations such as ECAFE, and (c) technical aids for the Overseas Chinese. These are discussed immediately below, in turn.

#### Traveling Regional Representatives

At least for a considerable introductory period, as the ITID operation and the addition of TIOs were developing, it would be useful to have traveling representatives of ITID, each covering a reasonably homogeneous or at least contiguous group of countries. (These men should not be confused with ITID's Pool staff members, who would each visit a few countries for a short period to get oriented, make contacts, and collect information.)

Qualified in the industry field and in production and use of technical media, the roving representative would work through local personnel and facilities (e.g., audiovisual sections, USIS production units, productivity centers, etc.) as seemed most advantageous, rather than set up his own production unit. He would have three functions:

1. Liaison between ITID and the various USOMs (especially the ITIOs) to help develop the technical aids service to be of greatest use to the field.
2. Liaison among the various USOMs involved in producing and using their own technical aids, to keep each informed of plans and activities of the others; helping them devise materials which might at the same time be helpful in neighboring Missions; encouraging the "riding" of requisitions of other Missions; arranging exchange and loan of materials, conferences to plan concerted programs, etc.
3. Advice to USOMs (Industry Officers, TIOs, Audiovisual Officers, etc.) on the widest practicable utilization of technical aids: in effect, "needling."

The SRI team's experience showed that simply having someone visit various Missions and ask questions can stir a good deal of activity. In a "pump-priming" stage, the roving representative would be an effective stimulant, particularly since selling the utilization of technical aids would be a prime part of his assignment.

#### Special Liaison With Existing International Regional Organizations

ECAFE is a notable example, in an area which can use stronger regional ties, of an operation that can benefit from ITID assistance. At ECAFE's Twelfth Session, February 2-14, 1956, in Bangalore, the following "Resolution on Exchange of Experience and Information on Scientific and Technical Matters" was approved:

"....(4) Recommends that economically advanced countries expand further in the light of future needs and developments their contributions in this regard for purposes of economic development and that the economically less advanced countries also make such contributions as may be practicable."

The ITID traveling regional representative, proposed above, could perhaps serve also as liaison man with such a group. Perhaps the Thai Mission (in the case of ECAFE) could assign a technical information officer as liaison. The implications of providing technical information through such regional organizations are so great that the SRI team does not feel qualified to make recommendations on the basis of the few hours it was able to spend at ECAFE. It does believe, however, that the subject warrants considerable attention, in view of its potentialities for service.

ECLA (the Economic Commission for Latin America) and OEEC are other examples where possible special liaison may be useful.

#### Technical Aids for the Overseas Chinese

In many of the underdeveloped areas of the Far East, the so-called "Overseas Chinese" play an important part in the business world, and increasingly in the industrial sector in at least some of the countries.

Inasmuch as the written Chinese language has long since been made uniform and standardized, these Overseas Chinese can read materials which might be prepared for Taiwan; or special materials could be developed for their use, as might be found practicable. (The spoken dialects are another matter, although Mandarin and Cantonese together would probably cover enough of the Overseas Chinese to be effective.) The various host countries have differing ideas about the ultimate position of these Overseas Chinese in their respective economies, and any program would of course have to be integrated into the larger blueprints by checking with the governments concerned. However, it is conceivable that a regional representative of some kind, working with the Overseas Chinese, might make a sizable contribution, and it would appear well worth further exploration by ITID.

#### E. Private Enterprise Participation

As was pointed out in Section III of this report, in the immediate situation of helping strengthen the governments of underdeveloped countries and helping technological development get under way as quickly as possible, the communications instruments employed can create the danger of too much government operation. The above list of channels through which ITID might operate could, in the wrong hands, constitute such a danger. The encouragement of a strong "private sector," however, is not only official U. S. policy but also reflects the thinking of America's

most influential business and industry leaders, and it serves to counterbalance the danger of abuse.

The official U. S. policy appears as Section 413 (a) of the Mutual Security Act of 1954:

"Sec. 413--Encouragement of Free Enterprise and Private Participation--(a) The Congress recognizes the vital role of free enterprise in achieving rising levels of production and standards of living essential to the economic progress and defensive strength of the free world. Accordingly, it is declared to be the policy of the United States to encourage the efforts of other free nations to increase the flow of international trade, to foster private initiative and competition, to discourage monopolistic practices, to improve the technical efficiency of their industry, agriculture and commerce, and to strengthen free labor unions; and to encourage the contribution of United States enterprise toward the economic strength of other free nations, through private trade and investment abroad, private participation in the programs carried out under this Act (including the use of private trade channels to the maximum extent practicable in carrying out such programs), and exchange of ideas and technical information on the matters covered by this section."

Recent events, including the entrance by Soviet Russia into the technical assistance field, have prompted vigorous statements from American business and government leaders, indicating a belief that American private enterprise has a dynamic role to play in technical assistance to underdeveloped areas.

The tenor of their remarks is perhaps best summed up by a statement in Time magazine (January 2, 1956, p. 7):

"Inside the Administration.....there exists a strong and growing feeling that government-to-government aid does not really get over the point of the U. S. economic system.....Said a top official last week: 'What we need to do is to recapture to some extent the kind of crusading spirit of the nation's early days.....The missionaries, the doctors, the educators, and the merchants carried the knowledge of the great American experiment to all four corners of the globe.'

"The official who said this estimates that every dollar's worth of private business done by Americans abroad has a political value worth ten dollars sent abroad by the Government. By continuing to make capitalism work and grow at home, and by spreading the word and the work overseas through private investment and public aid, the U. S. has its best chance to fulfill its obligations of world leadership."

The SRI team found a number of ways in which private American industry could help with the technical assistance program, and specifically with the dissemination of industrial technical information. One important way, as the above quotation indicates, is simply doing business overseas, and this report is not needed to support understanding of the value of that approach. There are, however, several other channels of technical information which private Americans can create (although some of them perhaps require government "pump-priming" at the outset). These channels will be detailed in the sections immediately following.

#### Why Private Participation

There are solid reasons why expanding the private American contribution will be helpful:

1. It brings like-minded people together--American businessmen and host-country businessmen person-to-person. They speak the same "language" of practical business, even if they speak different tongues. Because each side distrusts government to some extent, they find a mutual bond and can speak frankly. By cooperating--i.e., doing business together--they can both profit. Because it is a reciprocal arrangement, without the "taint" of government policy, there is no question of the host-country businessman feeling he has been bought in the political interest of the United States. When he gets technical assistance--the know-how to produce goods under an American patent, for instance--as part of a business deal, there is no possible feeling that he is being "given" something and is under personal obligation for charity of some kind.

2. It means dollars and cents to American business. Even when American businessmen make contacts overseas to provide technical information, motivated simply by patriotism to help American foreign policy or by altruism to help the underdeveloped areas advance, there is nevertheless in the long run a substantial gain to American business as such. When people overseas learn American methods, use American manuals, see demonstrations of American equipment, make personal contact with American

suppliers, organize their operations on the basis of American principles, gear their production to American standards, they will certainly end up doing business with America far more than if they were using Russian or German technical assistance, for instance. When requests for specific technical help from underdeveloped areas can go to an American firm in the same line of business or industry, there is a valuable personal contact that can lead to business between them. This applies, for instance, to an overseas subscription to an American trade journal resulting from the reading of a reprint or digest of one of its articles. It applies at the other extreme when a big purchase order for U. S. tools comes through because an American firm made sample tools and instructional posters available to a foreign school, whose superintendent thereby had a firm name to put down on his requisition for a vocational school's equipment. Or it applies when an American answer to a technical question about a process leads to a licensing agreement.

The foregoing is not intended to be a recommendation that only U. S. contacts should be allowed through an ICA program. On the contrary, as the ITID "Pool" recommendation shows, it is quite often necessary to get information from other countries, both developed and underdeveloped. The primary consideration must be usefulness of the technical assistance. But certainly where American business interest can be advanced without jeopardizing the technical assistance program--and because private contacts are helpful whenever they can be made--there would seem to be every reason to help these American interests.

3. The process of developing private contacts builds a permanent and integral part of a democratic communication complex not only within the host country--by business understandings, trade associations, the whole normal trade channel--but across international boundaries as well, strengthening the free world's ties, in a nonpolitical way.

4. Since there is a limit to the amount of technical information which can be processed through any given government at any one time, because of staffing problems and the priority of other business, the private channels open a way for the flow of more technical information than would otherwise reach the end-user.

5. It speeds the time when ICA can be abolished. At least the presumed termination date for ICA is the time when private channels and economic arrangements are so established that the U. S. government's efforts are no longer needed. In Europe, the SRI team repeatedly heard from ICA personnel the expression, "The sooner we can teach the host-country people, the sooner we have worked ourselves out of a job and can close this operation." It was almost a fixation, perhaps caused by

a policy directive to "phase out" quickly. In the underdeveloped areas, any such urgency is premature, but the philosophy that "we should always try to find a way to do the job that will get us out of the aid business sooner" should apply, as a conscious part of ICA planning--to leave the field to private business over a period of years.

6. It is probably cheaper even in the short run to operate as much as possible through private channels, and it is certainly cheaper in the long run.

There is one policy question which must consciously be taken into account before an aggressive program of making private business contacts can be undertaken, at least by some USOMs. The SRI team was given to understand in certain underdeveloped countries that the host-government's policy was very definitely against a USOM staff member's working directly with the "private sector." All technical aids, therefore, had to be given to a government official, who might or might not use the material. If this is unshakable host-government policy, there is little that can be done by Mission personnel. Nor can this report say whether it is better to try openly to get such policy changed, or to work as closely as possible to the edge of the policy and hope to erode it through time and precedent. It can, however, be pointed out that the TIOs or other Mission personnel may be operating from an untenable position if they are assigned to expand the private technical information channels without having a clear understanding that the host government has no objection.

#### How ITID Could Increase Aid from American Private Channels

It may seem strange that it should take government assistance to launch a program which is supposed to supplant government assistance. The fact remains, however, that ICA/W--and specifically ITID--could do a great deal to help increase private channels.

The private-sector approach to many programs and projects has already been mentioned in this report. There are in addition, however, specific technical aids projects which might be undertaken.

The first and most basic step would be to explain thoroughly and thoughtfully to American business leaders why their help is needed, and

to enlist that help.\* As American business responds, some or all of the following programs could be undertaken.

Private Cooperation Clearinghouse. The "Private Cooperation Clearinghouse" is suggested as a permanent body with a small staff, to make clear continually both to private business and to ICA how great the stake is in fully developing private channels overseas, and to encourage both groups to work together. It would thus be an outgrowth of the preliminary program proposed above, consolidating its gains into a permanent organization. It would operate to maintain a continuing public relations campaign to keep business aware of the opportunity and the need, and would arrange personal contacts where needed. It could be a project of the Public Relations Society of America, the Advertising Council, the National Association of Manufacturers, the Chamber of Commerce of the United States, the American Management Association, or a similar body.

This project might well be combined with the existing "Contact Clearinghouse" to avoid overlap and improve the operations of each. If, however, there is fear that the operation proposed here would involve larger firms in such a way as to jeopardize the small-business orientation of the Contact Clearinghouse, there would be no great harm done in maintaining separate organizations. There is also, of course, the office of Private Cooperation of USIA, with which there would be a considerable overlap; it might prove better to combine the two.

The function of the Clearinghouse, from ICA's point of view, would be not only to secure a general climate of American industry understanding and cooperation for ICA programs, but to facilitate a specific contact on any particular problem. There is some hesitancy by Technical Aids Branch to ask as much private cooperation as they might otherwise be able to use.

Sample letters the SRI team has seen, by which OTS and its contracted agencies attempt to get from U. S. firms the answers to Technical Inquiry Service questions originating overseas, indicate that better answers might be forthcoming if the firms addressed could be given more appreciation of the contribution their answers would make. The Clearinghouse would help develop such appreciation.

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\* A good deal of the preliminary matter in this report may be of assistance to ITID in such a program, and a judicious extracting of the salient elements to reprint for industry's reading might be a specific form of such assistance.

The launching of such a cooperative device as the Clearinghouse would appear well worth ICA financing, probably as a contract to pay the actual costs of the organization which undertook it. To assure private industry that this was not merely an attempt to "buy the good will" of American businessmen, the project would have to be approached carefully and there could be no strings attached to the operation, beyond the stated purpose.

"Letter-Link." In function, this project is somewhat akin to the "pen-pal" idea, and it should be left to the project managers to decide what is the most appropriate name to give the program. Its purpose would be to link one American firm with a comparable firm (or entrepreneur starting such a firm) in an underdeveloped area. In effect--but certainly without financial obligation--the American firm would "adopt" the other firm, to the extent of getting it the technical know-how required, and perhaps helping solve red tape and trade problems. Even better, the president of the American firm would assume the project personally, to make a more human program of it.

In practice, the program would be handled by a national organization and the individual firm would be able to limit its participation to little more than an exchange of correspondence, if it so desired, although obviously it would be better if personal friendships could be built up, personal visits were arranged, etc. (One specific item might be a year's subscription to a pertinent trade journal, at least ostensibly the gift of the American "link"; this might tie in to another project discussed below.)

Possible organizations which could handle the project are: the Chamber of Commerce of the United States, the National Association of Manufacturers, Junior Chamber of Commerce, Rotary International, International Chamber of Commerce, International Junior Chamber of Commerce, International Management Association, Council for International Progress in Management, Public Relations Society of America, Advertising Council of America, or--through the Small Business Administration--some grouping of smaller businessmen.

The parent group would set up a central office and would have a public relations staff to handle difficult letters which might come in. (All "letter-links" would be advised to turn over such letters to the central office.) It would get names and basic data of overseas firms from USIA, ICA, and the Embassies abroad, and it would furnish these names to the American firms volunteering to participate, having matched up as closely as possible the characteristics of the overseas firm with

any preferences stated by the American firms. Each American would write a letter to his "link" overseas, with the help of a specially prepared pamphlet suggesting contents of letters and giving enough background on underdeveloped areas and their problems to insure a proper approach. The letters would explain the "letter-link" plan, would invite the overseas party to reply and to feel free to call upon the writer personally for any technical assistance he might need; the writer probably would include some information about himself or his firm.

Other "pen-pal" operations have, of course, been tried and are continuing. The Junior Chamber has had an extensive program, and an organization called Letters Abroad\* took over an activity begun by USIA. The difference between such operations and the present proposal is twofold: (a) There is a useful or practical reason why the overseas "link" will use the proposed plan--he can get technical information easily, and can appreciate the value of such an opportunity; and (b) the contact should bring business, one way or another, to the American "link." He may or may not end up in some sort of direct transaction with his overseas "link," but from the circle of friends of his overseas contact, something of value is almost certain to result if the American is at all helpful and is interested in pursuing a business opportunity.

Sales Promotional Materials Service. Many U. S. firms go to great expense to produce promotional materials which have much educational value; some firms have educational departments working closely with the schools. Some of these materials have already found their ways overseas and are proving most useful in the underdeveloped areas, not only in schools but in plants and government offices for their industrial technical information. These include pamphlets, posters, samples, exhibits, cut-aways, mock-ups, displays, and films.

It is altogether likely that many firms would see enough value for themselves to make some of their existing promotional materials available to ICA for overseas use on a regular basis. If the advertising message remained--and there would appear to be no reason from ICA's point of view why it should not--they might be willing to pay the costs themselves; certainly they should be willing to allow ICA to "ride" their production orders and get extra copies produced at ICA's expense.

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\* 695 Park Avenue, New York 21, N. Y.

It might also prove true that some firms would be willing to produce materials specifically designed for underdeveloped-area use, for the goodwill and advertising benefits which would accrue.

An organized way is needed, therefore, to (a) tell industry and business what materials would be useful, and why their cooperation would be mutually beneficial; (b) find out what industry can and will do to help; and (c) procure and ship materials to the users overseas. ITID would be a logical organization to take the initiative in this, although obviously the Education Division also has a stake, as may some other divisions, and even OAVS could become involved.

To organize the Sales Promotional Materials Service, ITID could assemble an advisory board from among such organizations as the Public Relations Society of America, the National Advertising Council, the public relations departments of the National Association of Manufacturers and the Chamber of Commerce of the United States, and perhaps industry associations. Operating on a contract basis, ITID might finance a small paid staff to handle correspondence, contacts, and shipping of materials, working through the advisory board to the organizations represented.

The project would more than pay its cost, not only in dollars saved to ICA for materials donated by private firms, but also by a concerted program to spread the American advertising and promotional message to fruitful places abroad with an eye to resultant sales.

This again is akin to USIA activities, and a combined effort might be warranted. At the very least, ICA should have an interest in the USIA activities in this field.

Book Publishing Support. The value and methods of getting American books to the underdeveloped areas were discussed comprehensively at the Conference on American Books Abroad, held in Princeton, N. J., September 29-30, 1955, by the National Book Committee. A report of that Conference has been published for the Committee by R. R. Bowker Company, and SRI has had access to the working papers of the Conference. The material appears so valuable to the present study that it is being turned over to the Technical Aids Branch.

The published report and the working papers cover the subject much more exhaustively than this present study could, since it included books as only one of dozens of areas to explore. However, the SRI team's observations on its field travel bear out fully the pertinent data and conclusions of the Conference. It was unfortunate--and perhaps significant--that while USIA had no representatives at the Conference, ICA had only one (Dr. Gerald F. Winfield, Director of OAVS).

As the Conference report states, ICA, "with a parallel responsibility (to USIA) for the dissemination abroad of scientific and technical information contributing to economic development, has made a less extensive use of books." It would seem beyond dispute that books are a necessary part of the industrial technical information program, and elsewhere in this report SRI gives specific recommendations as to what ITID could do to increase the dissemination of books. At this particular point, the emphasis is on ways of developing a program whereby private American channels--i.e., in this case the publishers--can get more technical books overseas. The fact that through such private commercial channels the cost of disseminating technical information would be borne by the consumers in foreign countries makes this an important consideration because, as the Conference report states, these foreign consumers now spend nearly \$100,000,000 a year for books--a sum larger than USIA spends for all media.

Following are the SRI team's specific suggestions:

1. ITID should establish a liaison with the National Book Committee, attend the Committee's meetings, confer and generally be as helpful to their cause as possible.
2. With the above contact established, ITID should arrange with the National Book Committee for a meeting of some sort--perhaps a special conference--to explore in detail exactly how ITID can work with private publishers to increase the flow of technical books to underdeveloped areas. The other suggestions which follow this one might well be on the agenda for discussion at that meeting.
3. Ways should be explored to use Franklin Publications, Inc. to a greater extent. This organization, a nonprofit membership corporation, with headquarters in New York, operates presently in Egypt, Iran, Pakistan, and Indonesia to obtain rights on selected American books and to arrange for their translation and local publication in the local language. The SRI team paid particular attention to the Franklin operation in Egypt, Iran, and Indonesia, and was greatly impressed. Building solidly on local personnel and meeting local needs, Franklin is getting

a substantial list of American titles into the local streams of thought and practical application. At present, its titles are mostly literary or socio-political. There is no reason, however, why technical subjects could not be handled by Franklin, and ITID could well afford to study a specific operating procedure with them. One way would be for a USOM to determine needed technical titles and guarantee the purchase of enough copies to allow Franklin to proceed to negotiate with a local publisher for production (all Franklin books are handled through local publishers). Inasmuch as Franklin takes care of translation and production, the Mission would have no problem beyond distribution. And since it is the experience of Franklin that a publisher will print additional copies to sell on his own account, ICA would actually get more distribution of a book--at no more cost--than it had planned. These could be standard textbooks, comparable perhaps to the USAFI wartime series for troops abroad. Or they could be much more simple, at the level of the adult working class of an underdeveloped area; the Cairo Franklin office suggested a "how-to-do-it" series on such subjects as carpentry, plumbing, film-making, photography, electricity, radio, farm industries, canning, decorating, and painting.

4. At ITID's suggestion, large American firms overseas might well be willing to publish American books--especially technical books on management, economic development, public administration, and public relations in English or in local languages as gifts to appropriate host-country individuals. This would be a private American contribution to world understanding, and the firms would profit in terms of promotion and good will, to say nothing of obtaining solutions to some of their local problems through ideas contained in these books. American airlines flying the world might well put selected books aboard for passenger reading.

5. It may be possible to set up a cooperative book distributor for American books overseas, especially the cheaply-bound and nonliterary kind such as "fixit" series and "do-it-yourself" books. Franklin Publications could not undertake this because to do so would be in a sense competing with local publishers, but some other agency might prove useful, especially in the field of technical publications. The Informational Meida Guarantee program of USIA (discussed below) could be of substantial assistance.

6. American publishers specializing in technical subjects--Popular Science, Popular Mechanics, Mechanics Illustrated, the Fawcett publications etc.--might be available under contract to prepare special materials for ITID if their regular materials were not adequate. At the very least, some arrangement might be made whereby their materials could be made available for prototype use. This would involve such matters as copyrights, the loan of original art work, and perhaps the assistance of their professional writers and editors to put the materials into prototype form.

7. USIA, of course, has a major book translation program, and if ITID were to embark upon any comparable program for technical books, there should certainly be a conference with USIA counterparts to work out a cooperative arrangement.

8. In return for the private publishers' cooperation, and in their common interest, ITID might--through the Pool, especially--serve as consultants to publishers on questions regarding accuracy or suitability of materials considered for publication for underdeveloped areas.

Periodical Publications. In many ways, the periodical publications of American publishers--the trade journals--are more important sources of industrial technical information for underdeveloped areas than are books. This has been recognized, of course, by the establishment of the Technical Digest, produced by OTS under contract for the Technical Aids Branch. This particular publication is discussed in detail under "Media" but there are other ways in which ITID could work with private channels, and especially the publishers, to increase the flow of technical information abroad.

1. ITID should undertake to clarify and strengthen its relationship with the periodical publishers. The SRI team has the impression that the Technical Aids Branch and OTS are unduly concerned that the publishers will react negatively to any proposals which might be made for more reprints or more blanket reprinting permission. This may well stem from their experience with the Technical Digest, and the difficulty in getting publishers to give any blanket republication rights at all. However, it may be also that this is the result of an inadequate presentation of the need for this material and the benefits accruing not only to U. S. foreign policy but to the publishers themselves and to private American business. ITID would have convincing arguments: (a) use of materials from American journals in areas where little is known about journals from anywhere consolidates the leadership of American journals and leads specifically to subscriptions to the journals mentioned; (b) conversely, if the journals do not cooperate, they will lose out to European trade journals, which are prepared to promote themselves; (c) use of American publishers' materials helps American business, which helps the journals not only indirectly but directly as well, in terms of showing their advertisers their pulling power. The SRI team recommends, therefore, that ITID call a high-level conference with publishers involved and discuss the problem frankly and fully. It may be useful to have the assistance of the Private Cooperation Clearinghouse, recommended earlier. A second but less promising alternative would be research by an outside organization to contact the publishers and explore ways of cooperating.

2. Specifically, ITID might explore with the publishers the granting of rights for a "Reprint Service," and a photo-copying service, both of which are discussed under "Media" below.

3. ITID might also discuss with publishers the possibilities of a large-scale program to provide (at the publishers' expense) one-year free trial subscriptions to lists of potential regular subscribers in underdeveloped countries. ITID might subsidize this program by paying the postage, and it would provide, perhaps along with the Embassy and USIS, the names of recipients. As noted earlier, this might tie in with the "Letter-Link" project. This program could conceivably lead to enough regular subscriptions even to warrant discontinuance of the Technical Digest or the substitute publications suggested in Part II of this report.

4. There might be a way to utilize the resources of U. S. industrial house organ staffs, perhaps through the ITID Pool, to (a) secure their advice, (b) get them to write materials, (c) get them to include more technical information materials in their publications going overseas, and (d) get them to encourage their company's representatives overseas to participate more in the technical assistance program.

5. Because the American trade journals are on a level too technical for many firms in the underdeveloped areas, there may be a field for a kind of trade journal designed specifically to meet the need. In any given industry, the industry association might be encouraged to publish such a journal--perhaps under ICA contract to finance it in part. It could carry the advertising of U. S. suppliers in the field, and thus would be of direct benefit to American business, as well as assisting ICA in its program. There is reason to believe such a publication could be self-sustaining in time, and little reason to believe it would compete unduly with the established American trade journals. ITID could well take the initiative in exploring this possibility, which, again, could grow into a medium replacing the Technical Digest.

6. There is a comparable need for a Management Digest of some kind for "new managers" in the underdeveloped areas. Here again, it may be possible to produce this through private channels, perhaps with the CIPM or the International Management Association handling it. It could be subsidized in some way, perhaps by ICA or a foundation; or it could attempt to become self-sustaining with advertising and subscriptions. Among its contents, which would make it a unique service to these "new managers," could be special articles directed at their problems by ranking American management experts, good book reviews of management titles, lists of new films, schedules of conferences, and scholarship

opportunities. It might lead to the formation of international management groups as well.

7. It is at least a possibility that the Technical Digest could be replaced by a private American publication, called perhaps "World Industrial Development" or "Industrial Techniques," to serve the same general purpose as the Technical Digest. It would be published in English, but at an engineer's level, which would still allow a considerable readership and would provide an excellent medium for American trade advertising. It would have to be a substantial effort, with its own staff members in key countries; it could work with the ITID Pool, of course, and it could make its own peace with American trade journals on their materials. (It might, in fact, be a combined effort by the trade journal publishers to develop the field for their later more specialized publications.) The staff members in the key countries could be unofficial American representatives for industry relationships, and as such provide a useful auxiliary service.

Consultants' Pool. This particular recommendation is recognized as dealing more with "people" than with technical aids materials. However, it is included because it has a direct bearing on a major activity of the Technical Aids Branch--the Technical Inquiry Service. Also, if the recommendation were adopted, there would be need for specific materials developed for the use of the consultants.

There is need for a pool of American specialists who are available on short notice to make a hurried trip for a few days or weeks to solve a particular problem. Often, the presence of this expert on the scene would provide an answer that would otherwise go to the Technical Inquiry Service--and the difference would be not only in the speed of the answer but in kind of answer possible, because much more can be covered by a man who is present. Because he is at hand, he can be more flexible in his answer, and see to it that it is the right answer and fully understood. On important questions, for critical industries, this can be of immense value.

These consultants would be qualified industry people, engineers, educators, and others who could not get away for the year or two years usually required of specialists, but who might be happy for a chance to serve briefly. Their necessary clearances would be prepared in advance, their inoculations and vaccinations completed, their passports in order. They would be generally brief on ICA's functions and on conditions in underdeveloped areas.

Such an expert, catalogued for his specialty, could be quickly on his way once a request is received, in much less time than it would take to work out a paper-planned project. Knowing something of the problem he was to face, he could carry the special reference materials he might need that would be unobtainable even in a general industrial reference library such as a USOM might maintain overseas. With his knowledge in his head, he would have some ideas formed upon arrival. Selected because he was a good, flexible man, he would see the problem, solve it, and go home. Once returned, he would retain a personal interest and his personal contacts, to answer further questions, get supplementary material, and otherwise be of service.

The Missions have in some ways moved in this direction. They notify each other of specialists available in the area. They trade specialists on occasion. They may, in fact, be moving toward a permanent pool of trouble-shooting specialists, on the ICA payroll and available to go where needed, at least among the basic industries. Such a group would be a very useful carrier of ITID materials.

The private consultants' pool would have a useful by-product for American business, since the flying consultants would often enough be talking in terms of processes or equipment which might as well be American as European or Japanese. On some basis, perhaps in recognition of its service to American business, the consultants' pool could even be set up as a self-sustaining operation. It might, in some cases, be an industry contribution, with the specialist going at his own firm's expense. The SRI team found that there are many businessmen abroad who would be most happy to pay all the consultant's expenses and fees (in local currencies) just to have him advise on a specific problem; they do not want to get involved with government services, but they do not know where to get consultants themselves.

Such a pool might even replace long-term technicians in USOM Industry Divisions. The establishment of a plant is a unique problem often calling for more special skills than any one long-term technician could be expected to have; therefore, a specialist is brought to a country to get a plant started. He draws up specifications and then has to wait six months or a year before the plant is erected, before he can get to the next phase. A short-term consultant could do the first part, then return home, and come back when the plant was ready for him. This would save ICA money.

Mission officials abroad who discussed this proposal with the SRI team had one caution: it could work only if a "clear-channel relationship" could be arranged for the short-term consultant, so that when he

arrived he would have one official to check with, and could get right to work, instead of wasting all his time finding out whom to see, what to do, and how to do it. Once this problem could be met, they indicated, there would be many advantages to such a pool.

The implications to ITID would be important, of course, in relation to the Technical Inquiry Service. Since another division has cognizance over the sending of Americans abroad, there would have to be liaison on the question of deciding whether a particular question to the Technical Inquiry Service should be answered by OTS or whether it would be better to send a short-term consultant. A recommendation from the USOM Industry Officer should be given full weight.

There would be a useful by-product to ITID in such a consultant service, especially if the ITIO could be involved. Reports of the findings and recommendations of such consultants on particular problems would often prove to be the substance of useful technical aids materials which ITID could then distribute to the field.

American Business Travelers Abroad. In the same way that a short-term consultant's pool could be of assistance on particular problems, arrangements might be made to take advantage of a qualified American private citizen traveling in or near an underdeveloped area needing help. ITID, particularly through the Technical Information Pool, the ITIOs, and the ITID house organ, could all be helpful in keeping everyone concerned notified of the availability of these "resources." It would amount to an informal "clearinghouse" or contact arrangement for U. S. businessmen overseas: they would go about their own business, but arrangements could be made very simply to have them talk before some group, advise the Mission on some problem, or talk with a particular firm needing help. Probably, the plan could be initiated simply by announcements through the Foreign Commerce Weekly, CIPM, AMA, IMA, or the Public Relations Journal, that ICA will welcome notification of any businessmen who would be willing to help in this program. It could be made clear that he would be under no obligation to do so, if it interfered with his own business abroad. But because it would give him entree and contacts for new possible business, many an American businessman would undoubtedly welcome the opportunity. This has been done on an informal basis with success.

This program need not be limited to the visiting businessman. The local plant manager, or American engineer, of an American firm overseas, could be an important source of technical information to foreign entrepreneurs.

It is obvious that a program which takes all of such people into account will require certain additional technical aids. The Americans taking part in the program could distribute any existing appropriate literature and could use films; they could advise the Mission on new materials to develop, or arrange to get appropriate materials from their own home office.

Trade Fairs. The international trade fair is a good channel for technical information in the underdeveloped countries because the foreign trader there often becomes the manufacturer. Having the interest and the money, and an appreciation of the lower cost and higher profit that local manufacture will bring, he wants to start a plant--but lacking manufacturing experience, he needs industrial technical information.

The trade fair also provides contact with existing manufacturers who are showing their products, and who might learn useful information on how to improve their operations.

ITID could take advantage of trade fairs in the following ways:

1. Working probably through the ITIO, and/or through the Department of Commerce in Washington, it could have a part in such fairs, getting space to present industrial technical information in a way that not only would disseminate the information but would help other American objectives at the fairs.

2. By means of its own exhibit at the fair, or by promotional materials available at other American exhibits, the USOM could describe the full technical aids service and invite interested businessmen and industrialists to use the Mission and productivity center or local technical institute facilities for additional or specific technical information.

3. ITID, working with the other U. S. agencies interested in trade fairs, could provide a service to U. S. private industry, advising prospective exhibitors as to the types and subjects of exhibits which would be beneficial to all concerned. The Technical Information Pool would be especially helpful in this regard.

4. In addition to the assistance to the particular American firm, the exhibit which would be developed for it could become the prototype for exhibits or displays to spread the same technical information to other underdeveloped areas. The trade fair could thus become a "developmental laboratory" of sorts for ITID's technical exhibit service.

### How ITID Could Help Develop Private Channels in the Underdeveloped Areas

Many of the suggestions in the above section relating to increasing participation from American private channels also affect technical information operations in the underdeveloped countries as well. There are, however, further specific projects which the ITIO might explore, with ITID backstopping, to help develop private channels.

The Whole Area of Private Organizations. These range from cooperatives and credit organizations to voluntary associations of manufacturers. Cooperatives have a "grass-roots" organization that uses technical information on a very practical level and by direct contact. What manufacturers' associations can do is perhaps exemplified in Japan, where they are organized industry-wise by area and are federated. These associations have developed a spirit of mutual assistance among smaller units and act as agencies for dissemination of technical and marketing information. Even in Addis Ababa, Ethiopia, where there are not enough firms to form a true association, there is a start with a "Tuesday Club," under USOM auspices, the leaders joining at luncheon to discuss common problems and exchange information.

The local business community, in other words, is itself a channel of communication which can be fostered. Associations can spread technical information by programs at their regular meetings, by exhibits, conventions, mailings, periodicals, and announcements. In all these activities, a fledgling association can well use two kinds of material help from the ITIO: (a) subject-matter aids, such as exhibits and basic data on specific products and processes, and (b) handbooks and other know-how on starting and managing associations and on disseminating technical information.

Private Investment. It is perhaps not emphasized enough that the very process of getting American investment into an underdeveloped area is a form of increasing the flow of industrial technical information. This know-how is part of the deal under which the capital is invested; sometimes it is the chief reason the host-country entrepreneur seeks foreign capital. Licensing arrangements are substantially a method of transmitting technical know-how. When equipment is purchased as a result of new capital, the technicians who accompany it to install it and to train operators are passing along technical information of the most practical kind. ITID should cooperate to the fullest, then, with

the Contact Clearinghouse, and seek other ways of stimulating the idea of private investment.

Banks. USOMs should use existing channels and develop new ones to reach business and industry generally with information. Specifically, commercial banks as well as development banks can use such technical aids as Plant Requirements Reports and Industry Profiles, and material on such matters as how to prepare a prospectus, what it takes to start a business, and descriptive lists of possible new industries for the area. Trade directories are useful, but are seldom undertaken because of a lack of know-how on preparing them, and a lack of funds. The ITIO might be of assistance, and an ITID handbook on preparing trade directories would be of use.

Factors. In some underdeveloped areas, there are so-called "factors," or middlemen, who work with small producers by providing raw materials, extending credit, assigning orders, supervising for quality or standards, picking up the finished work and sometimes handling the marketing. Being in such close touch with the producers, they can easily pass along technical information; in fact, the producers look to them for such information. This group, therefore, is a ready-made "extension service" and might well be provided with materials, on the basis of ITID prototypes but made to their local specifications with the assistance of the ITIO. (The small industry branch of the Philippines school systems is, in many ways, such a factor, and it can use the type of material suggested.)

Help for the Private Communications Industry. In almost every underdeveloped area, the communications facilities and know-how are at about the level of the economy as a whole. Yet, as has been pointed out in the discussion of the communication complex, they must be at least a level higher than the rest of the economy, as a "predevelopmental condition." Much of the development in this field, notably radio, television, telephone and telegraph, the mail, roads, and power, would appear to be in the "public sector," or under government control. The printed word, however, can be both public and private.

The printing and publishing industry appears to need help in the way any other industry might--in all the physical problems of plant and equipment and in the human problems of trained and efficient personnel. Specifically, it needs qualified editorial and editorial-production men, if printing is to be most effectively used in communication. With ITID

backstopping, the USOMs might well consider training centers for printers, for editorial workers, for journalists, for publishers. Technical aids will be needed for such training.

The printed media particularly offer channels for industrial technical information to reach a general readership, and the ITIO--armed with prototype materials--would be able to get editors to use copy of this kind. The team explored the value of creating new ITID media especially for use by the host-country mass media, such as clip-sheets or feature series, but concluded that the problem was so varied and localized that the ITIO would have to devise ways and means of using the mass media without too much specific assistance from ITID. As in the United States, the mass media will use industrial technical information only if it is "dressed up" with reader appeal (which varies by locality); to a circulation-minded publisher, "public service" is not a sufficiently compelling reason. Where the ITIO can develop reader interest in his material, he can have good success. ITID can, of course, furnish the ITIOs with tips on how to achieve this, notably by passing along ideas which worked in other countries. The contemplated house organ (see "Media") would be a channel for such ideas to reach the ITIO.

Journals. There is a great need for local (i.e., host-country, national) trade and professional journals, to spread widely the technical information from the few who originate it or have access to outside sources for it. It is not simply a matter of staffing or funds, although both of those are extremely important; there is also need for worthwhile subject matter or contents, to justify the journal's existence and get it a foothold. With ITID materials, the ITIO could be of great help. It might prove feasible for the ITID Pool to prepare specific articles for such journals, and even to service them with continuing features, such as calendars of events, reports of new developments, actions at conferences, etc. Such a service might be fully warranted on an organized basis once the number of journals approached the point of, say, one per country, in whatever field.

Just how these journals might be founded will vary from country to country. In some cases, government sponsorship may be necessary; in some countries; there may even be enough advertising to sustain a completely private venture. One very promising way would seem to be through the universities. Just as it is still a tradition in American law schools for students to edit the law journals, so student engineers could be found to edit journals--using materials written by themselves and the faculty, as well as by USOM experts, and with faculty or USOM help in getting translations of outside materials. Alumni associations are

forming and requiring publications; perhaps there could be a merging of interests. Conceivably some governments might object to thus encouraging student editors, because in many parts of the world the student is likely to be the leader of the more vocal and antigovernment political movements; however, the idea is worth exploring.

One other likely source for an editor for a potential journal is the "Type 1" participant, the host-country national brought to the U. S. for training. He might be selected specifically for the role, or he might be introduced to the idea while in the U. S., and be given special opportunity to observe American practice.

In any event, it is important to bear in mind that the creation of such journals is facilitated--and in many cases prompted--by the availability of industrial technical information from ICA. Just as technical aids can lead to the development of a productivity center, they can lead to other channels of dissemination, such as journals.

Film Making. Although training films are usually considered a government field in most underdeveloped areas, there is again no fundamental reason why this should be so. There are film censorship boards in many countries, but the censorship would hardly restrict industrial technical information subjects. Private industry can be encouraged to make and use films, as in the U. S., on an industry-wide basis if there are not large enough firms to make them for themselves.

The development of an entertainment film industry is in many ways the foundation for the technical film industry. Because of its greater needs (i.e., more films because of its larger audiences, and ever-increasing technical excellence because audiences increasingly demand it), the entertainment film industry amasses production facilities and know-how which could not be afforded by a technical-film industry but which can be used for technical films as a by-product.

Again, ITID can be of service with technical aids to provide the basic know-how to be conveyed in the film, and the ITIO (working with the Audiovisual Officer) can be of technical assistance as well in the actual scripting and production. It would seem worth ICA's effort to help in private film production: just as a local film is more useful than a U. S. film, all else being equal, a private local film often is more acceptable than a government film, as far as private industry is concerned.

Advertising. The function of advertising as a catalyst, for the other communications media as well as for stimulating production by creating demand, is not too well understood in the underdeveloped areas. It is not employed to its useful limit, and where it is tried, its techniques are often ineffective. Yet a thriving advertising industry pays the way of private publications and in itself communicates news (i.e., technical information) about new developments to the consumer at various levels.

As has been indicated, this is part of the problem of developing the communication complex, but it is a problem which ITID can keep in mind in the preparation of all its materials, especially in management and marketing. Constant recognition of the value of advertising, and training in its techniques, can make a substantial contribution to the strength of private channels of communication and to the entire business structure.

#### F. ITID's Relations with Other Agencies

The Technical Aids Branch, simply offering and providing specific media for such dissemination as may be achieved, presently is not very directly or very deeply involved with other governmental agencies. However, if ICA undertook a technical information program of the magnitude being recommended in this report, it would become a different matter. ITID would be a world force, with a great potential in the underdeveloped areas; its activities and policies would overlap the functions of other agencies, and the implications of its program would have wide repercussions. Some of these overlaps (or opportunities for cooperative effort, as they might well become) have been touched upon in this report. It is useful, however, to discuss them more systematically, in view of the effect ITID's relationships will have on its internal production program.

#### ITID's Relations with Host Governments

Many host governments--from the large (India) to the small (Ethiopia)--are quite sensitive about ICA programs not fully planned and cleared with them in advance. Uncontrolled dissemination of information has the general effect of worrying governments, especially insecure governments. An information program which has not been cleared is perhaps in a more vulnerable position than most other activities.

Because of the way the technical aids program was started and the way it has grown, there has been little occasion to have it considered as a separate program and discussed as such with host governments.

However, it may be approaching the point where it is a formidable entity, and if any substantial part of the recommendations made in this report are adopted, it will certainly constitute a program to be noted and treated as a particular effort. It has been recommended already in this report that the expanded technical aids service should be announced as a "new" program, for various reasons. Before such announcement is made, or before it is reflected in the action program of a given Mission, it would in many countries be wise to clear the matter with the host government. In most cases, there should be no difficulty, especially if the program is properly explained. As has been noted, certain governments are concerned about contacts made directly with the private sector. But, as was indicated at that point, it is important to the operation of a technical aids program that the host government understand the intent and potentialities of the program.

A question which will likely arise in the wake of broaching the whole subject of technical aids is, "Where should the program be placed--within the government or outside, and if within the government, then in what Ministry?" The team offers the following principles as guides, but recognizes that, in any given country, there may be controlling circumstances which will make them impossible to follow.

1. The host government should by all means have at least one agency engaged in developing and disseminating technical information, but the USOM should be free to work directly with the private sector. There should be the clear understanding that ICA will not pursue a policy contrary to that established by the host government, but, as discussed earlier in this report, there should also be an affirmation by the host government of the value of building private channels of communication.

2. At the very least, the USOM should be allowed TIOs in the various subject-matter fields, even though the host government prefers also to have American counterparts in the host-government's technical information services for guidance and training.

3. Ideally, each Ministry should have its own subject-matter technical information service, but if economy requires a consolidation, it should be so placed that no one Ministry can claim an undue portion of its effort.

4. If there is a close choice to be made between two government offices as channels for disseminating ICA technical aids, both should be selected--especially if ICA's own efforts and materials are concerned: ICA should be working always for as widespread a dissemination as possible.

5. Between the alternatives of selecting perhaps the wrong agency as the disseminator or facing uncertainties and delays in selecting the proper one, it is better to go ahead and begin operations with the available one which may be wrong. While technical information can cause some harm by mishandling, if it is used at all there will be built up desires and pressures sooner or later to get it handled properly. However, if it is simply stored by ICA pending a decision, the host country will never get to know enough about it to desire it, and there will be a loss of valuable time in orienting the host country to the uses of technical aids.

#### ITID's Relations With International Agencies

The SRI team discovered that many other agencies, particularly the specialized agencies of the United Nations, such as Unesco, the Food and Agriculture Organization, and the International Labor Organization, produce technical information materials which relate directly to the ICA program. In some cases there are overlaps, and in almost all cases there was apparently no knowledge on either side that the other was working on a particular subject. Some sort of coordination, and perhaps pooling or division of efforts, would be useful.

In the field of industrial technical information, ITID would have not only facilities but an important reason for being in contact with these agencies, under the program recommended in this report. If the technical know-how needed for underdeveloped areas is not necessarily U. S.-originated information, but material based on experience in other underdeveloped areas, the other international agencies would be logical sources. The staff of the ICA Industrial Information Pool would quite properly cultivate and draw upon these contacts. It would by no means be one-way traffic, with the Pool receiving information and returning nothing. The other agencies would (unless there is a high-policy ruling against it) receive ITID materials, and they should be able to ask technical questions through ICA channels in the same way as a host government or private citizen.

On a minor and informal basis, there can be an interchange of technical materials among international agencies, and no question is raised. There are, after all, many different ways by which a UN technician could get a copy of an ICA technical pamphlet, and he could copy or adapt from it without anyone's knowing. But as the ICA technical information program increases in dimensions, two fundamental policy questions arise which will require an answer on all sides:

1. On what basis, if any, may one agency give the other its materials? Specifically, can ICA make available its materials free to the United Nations, and can the UN accept them without an international agreement of some kind?

2. How may overlapping efforts among the various agencies be coordinated? Again, can ICA and the UN or a specialized agency pool their efforts on a given pamphlet, or can ICA, for instance, subsidize FAO to produce a needed pamphlet because the ranking expert is part of FAO's staff?

The SRI team does not consider these to be major political issues in any sense, but it does believe they are points to be agreed upon, in the interest of establishing a clear status for the ITID program. The following principles are suggested as a basis for such an agreement.

1. There should be a completely free exchange of unclassified technical information among the specialists of the various international agencies, for their own use and for further dissemination at their own discretion to meet the world's needs (copyright restrictions being observed). Whenever the materials are required in quantity for a program, the quantity should be financed by the agency responsible for the program.

2. If one agency requires a substantial effort from another agency on behalf of a program for the underdeveloped areas, it should be free to contract to that agency for the effort on a reimbursable basis, at cost.

3. The various agencies involved in potentially overlapping activities should each assume responsibility for informing the others. If one agency is prepared to undertake the mechanics of coordination, there should be no reason why the other agencies cannot participate in the effort--e.g., if the ITID Pool functioned as a clearinghouse of industrial technical information projects, there should be no reason why FAO, ILO, et al, should not join in supplying information and using the material gathered.

Inasmuch as this would mean, in practice, that the U. S. would probably bear more than its ordinary share of the load, there may be some doubt as to the acceptability of these recommendations. This reasoning may be offered in substantiation:

1. In relation to the total technical assistance budget of the U. S., the additional cost is negligible, and is well worth the difference

if it makes possible an unhampered flow of technical information instead of binding it up with red tape, fears, and inactivity while administrators waste time deciding what policy applies in a specific instance.

2. The U. S. technical information program stands to gain more from the exchange of technical information with international experts than it could possibly buy for the same additional money applied to its own efforts. While such figures are difficult to estimate, it may be fair to say that if the cost were 10 percent more, the benefit would be 100 percent more--in terms of the validity and usefulness of the technical information for underdeveloped areas.

3. It is the expressed purpose of the U. S. technical aids program to disseminate technical information to underdeveloped areas. If other agencies are prepared to augment that dissemination at the minor cost of coordinating with them, it would appear to be a fortuitous bargain from the American point of view. The fact that information would be disseminated by these agencies without giving credit necessarily to ICA would be favorable evidence of the sincerity of the U. S. effort, challenging the belief that ICA operates only for political purposes.

The recommendations in this report, as have already been noted, would go far toward making ICA the clearinghouse for industrial technical information for the world, through the ITID Pool. The operation would be so set up that it could move in any direction, as U. S. foreign policy determined--e.g., even if the U. S. decided to put all of its technical assistance effort into the UN, the Pool could move over to the UN as a unit and perhaps as the nucleus of a world technical information service, or of an international association of industrial institutes.

The emergence of the Technical Aids Branch program to even its present level is creating a practical problem of coordination. It was evident to the SRI team that there was little recognition in the international agencies around the world that the media of the Technical Aids Branch existed. FAO was proceeding with "rural industry" materials that might well parallel--if not conflict with--the "small industry" or "cottage industry" materials produced through Technical Aids Branch,

while ICA personnel considered FAO to be involved in agriculture only and never thought to check on the rural-industry overlap.\* ILO has a technical assistance program which involves productivity centers. The team was told (but has not confirmed) that Dr. Samuel Lurie, Economic Affairs Officer, Bureau of Economic Affairs of the UN in New York, is planning a conference of 12 top UN experts in New York to write "bare minimum plant equipment requirements reports," a project which certainly ought to be aware of Technical Aids Branch's program. ECAFE experts were found to be starting at the beginning to find information which Technical Aids Branch might easily furnish them.

The SRI team recommends that part of the initial activity of the Pool should be to determine, in each of the countries where other international agencies operate, just what their technical information programs are. On the basis of this information, ITID might be warranted in calling a conference of the heads of the technical information programs involved, to see how they might better coordinate.

One question which probably will come up for early decision is whether all of the UN field experts, for example, should look to their New York headquarters to obtain ICA materials for them, or whether they might be expected to be in contact with ICA personnel in their host countries and get their materials that way. Most officials who were asked this question by the SRI team felt that UN in New York should take the responsibility of servicing its own people, and the team sees no particular objection to that approach. Conversely, it also sees strong advantages to a local sharing of information, and therefore makes no recommendation except to suggest that the desires of UN headquarters should decide. Informal inquiry of the United Nations Technical Assistance Board in New York indicates it would be possible to work out a simple arrangement.

In a somewhat comparable instance, the Technical Aids Branch is understood to have agreed, at the Spring 1956 EPA technical information meeting in Rome, to furnish its materials to EPA's Paris headquarters

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\* An FAO expert in Rome furnished the following subjects as among those on which FAO has developed material: Essential Considerations in Mechanization of Farming, Equipment for Cleaning and Grading Grains and Seeds, Equipment for the Processing of Tea, Equipment for the Tanning of Skins and Hides, Use of the Revolving Capital Plan by Cooperative Associations, Equipment for the Ginning of Cotton, Equipment for the Processing of Long Vegetable Fibres, and Equipment for the Processing of Rice.

for dissemination by EPA itself to all European national productivity centers. In the absence of USOMs in Europe henceforth, this is undoubtedly the most feasible answer, although there are few enough centers and their existence is so stable that an ICA mailing list could be maintained for them. The problem rests on how EPA will disseminate ICA material. If EPA selects certain portions of it, and then digests those portions, little effective dissemination may result. The added costs of distribution would seem to be preferable to losing the value of the material by having it watered down or filtered out.

#### ITID's Relations with USIA

It is significant that the Memorandum of Agreement Between United States Information Agency and Foreign Operations Administration (TOICA A 346, June 29, 1954, still in effect for ICA), which delineates the functions of each and describes how they will cooperate, does not even mention the Technical Aids Branch or its materials per se, although it goes into detail concerning OAVS and in effect implies OAVS responsibility for Technical Aids Branch materials.

This is, of course, no great obstacle. Section IX of the Agreement provides a formula whereby ITID could work fully with USIA, and in any event the Agreement could be changed if necessary upon the emergence of the TIDs as the line operation for dissemination of technical information in all the subject-matter areas. The fact of Technical Aids Branch's omission from the Agreement does demonstrate at the least that ITID will be moving from a behind-the-scenes position to an overt program activity which will have to be recognized and given due status if it is to function properly vis-a-vis its counterparts.

The SRI team was impressed with the USIS operations as it saw them overseas, although it limited its study to possible USIS relationships with an expanded ICA technical information program. The officials in charge--the PAOs--uniformly were aware of the implications of such an expanded program, and uniformly were willing to cooperate to the maximum. It was apparent that they were to some extent operating technical information programs of their own--notably through the USIS libraries and film services--and that they had given little thought to coordinating such activities more closely with ICA.

Particularly if ICA is to assume responsibility for motivating host-country governments and peoples to utilize technical information better and to speed their technological development, it may be that the distinction between the roles of USIA and ICA will have to be restated

somewhat. USIS is not the only U. S. agency operating to affect the opinions of the leaders in the underdeveloped areas. If ICA's technical information program is to be fully effective, ICA (or is it USIS?) will have to explain continually the technological civilization, its needs, its processes, its effects, to prepare the climate for the application of techniques which will bring the technical changes which will in turn provide the international stability the U. S. seeks. As was suggested earlier, if USIA is to prepare the climate of democracy, perhaps ICA has the responsibility for preparing the climate for technological development.

The minimum implication is that USIA and ICA will have to work even more closely together, especially in the overlap between general information and technical information. The advantages each side brings the other are so obvious they need not be spelled out; there is, however, one possible drawback which the SRI team explored and should report upon. It is conceivable that too close an identification of USIA and ICA will taint the technical information program with a propaganda overtone in countries which are suspicious of America's political intentions. This appears to be a real factor in some areas; in others, it is no danger whatsoever. Obviously, the USOM must guard against becoming a propaganda organization.

With this in mind, the following seem to be the areas in which USIS and a USOM could join together in disseminating technical information.

The USIS Libraries. Most of them now have technical and reference sections, which are used as much as the cultural collections--or perhaps even more. The reference librarian in many libraries is answering more technical questions than the USOM Industry Division or the national productivity center in the same city. What is striking about this fact is that the librarian was in no case aware of an existing ICA service, or was concerned at the quality of technical information she might be passing out. The possible relationships in book and library programs are discussed under "Media."

Presentation Copies of Materials. USIS has entree and contacts of great value to USIM Industry Officers, and presentation copies of books and journals are often made. It would not be difficult to utilize this channel better for the dissemination of technical information--especially on the planning, management, and motivational level.

Films. USIS has a film service in full operation, whereas too often the USOM program is still in the development stage. As is discussed under "Media," the film services of the two agencies could perhaps be more closely related.

Publicity. USIS can publicize the availability of ICA technical information in a variety of ways, and stimulate its use. Since technical questions are often asked of it, especially in the libraries, USIS can refer questioners to the USOM for better technical service. It would do no harm, and perhaps even help USIS, for USIS to become known to the less-than-sophisticated industrial user as the place he should go first when he needed technical information.

"IMG." USIS is responsible for the management of the Informational Media Guarantee program, which has important implications to the procurement of technical information media as well as cultural subjects.

Book Translations. USIS has a book translation program which might well tie in to industrial technical subjects.

Displays. USIS has responsibilities in connection with U. S. exhibits and displays, and technical information displays could well be tied in, to mutual advantage.

Although some USIS officials felt it would be going beyond their function, others agreed that USIS could publicize the efforts of host-country productivity centers or industrial institutes sponsored by ICA.

The foregoing are not necessarily all of the possible areas in which USIA-ICA cooperation could be worked out, but they are sufficient in quantity and variety to suggest that the director of ITID, under an expanded program, ought to take the initiative to explore in some detail just how his operation and USIA could work together more closely.

#### ITID's Relationship to Private Technical Assistance

There is an increasing amount of private technical assistance to the underdeveloped areas. If the idea recently advanced by President Eisenhower, to expand greatly the technical assistance program through universities and private foundations, should take effect, it will be

important for the Technical Aids Branch to have policies and an operational structure that will lend themselves to close cooperation with universities and foundations. It is felt that the same philosophy of all-out effort toward worldwide collection and distribution of technical information, as is recommended in this report for ICA's relationships with its own Missions, with United Nations agencies, and with other multilateral organizations, will be consistent with and useful to such an expanded program.

#### The Mobility of ITID

This leads into one final major consideration: the mobility of ITID itself. In view of the past history of ICA and its numerous predecessors, and the political issues which revolve around it, account must be taken of the possibility that the ICA operation as a whole is subject to drastic change or even discard. Yet the industrial technical information program will be a necessity in the underdeveloped areas for the foreseeable future. It would seem wise, therefore, to so establish ITID that it could be transferred bodily, if required, to some other agency to carry on its function. One direction in which this might go has already been suggested--the inter-university effort. Another would be toward a world agency--perhaps a kind of "world productivity center" or "world industrial information center," governmental, private, or jointly managed. As ITID developed its contacts with other international agencies, especially through the Industrial Information Pool, it would become increasingly valuable as the nucleus of such a world center.

#### G. Guiding Principles for ITID

This section of the report sets forth some operating principles which have been deduced from the foregoing problems and solutions. They are offered not only as a basis by which the administrator of ITID might function, but also to summarize in another way the approach being developed in this report. They may thus make clearer the implications of some of the foregoing observations.

#### Basic Principles

When all of the detailed difficulties which the ICA technical information program faces with language, cultural differences, governmental regulations, administrative problems, and policy questions are analyzed, they can be best resolved by six broad principles.

1. Materials must be localized to meet best the great and yet often subtle local differences that compound the intricate communication process from originator through transmitter to receiver, as described in Section III. Nothing transfers to an individual's understanding unless he sees it in his own context, his own framework--and the local differences shape his framework. These differences spring from language, culture, geography, climate, political history, economic conditions, educational opportunities, and technological levels, and many of them must be taken into account not only country to country, but village to village and even individual to individual.

2. Materials must be flexible and adaptable to meet best these local conditions. The more intricate the local conditions, the more flexible the materials must be.

3. Indigenous persons must be involved as deeply as possible in the production and dissemination of technical aids, because it is very possible that an outsider such as a TIO may be thrown off completely by a very subtle, but most important, circumstance he could not sense through his own "framework." Furthermore, this is one important way the local communication complex can grow.

4. There must be easy and quick access to technical information sources locally and from Washington--because all the advance planning and adaptation to local conditions cannot foresee needs which can arise with great urgency and importance. Even more basically, information sources are a well-spring to nurture the growing communication complex.

5. Any backstopping which can be done in Washington should be done there, rather than left to the field, especially in an underdeveloped area. The overhead is lower, there is usually easier availability of the specific talents required, the red tape is cut down (anything sent to the field automatically increases paper work through all channels), and the local staff is thus freed to do other things.

6. The host-country governments and people must be increasingly motivated to want technical information by understanding its usefulness. They will then help get it and distribute it, they will not be as disturbed by extraneous factors, and they will profit from it more.

The operating guides which are suggested below are designed to carry out these six basic principles.

### Operating Guides

The following guides are specific elaborations of the above basic principles. While they are not absolute rules for all cases, they are considered workable under most conditions.

Operating Guide No. 1--Prototypes. Wherever local conditions require some adaptation at least from the standard American version of a technical aid, and where it is clear that there is enough value to the particular technical aid to warrant the expense, ITID should prepare the material as a "prototype." A prototype, in the sense used here, is the basic product--e.g., a pamphlet, an exhibit, a film--so designed as to include all the elements which should be useful to the ultimate recipient, but clearly intended as a sample from which someone in the local situation can then develop a finished product to take into account all the pertinent local conditions. The prototype would be in English; it would be at a level and in a style best calculated to serve most users in the underdeveloped areas; but it would also provide deliberately for the easiest possible transformation into a local product--and into different kinds of media. For instance, its art work would be simple and as little identifiable with one area or people as possible, so that a local artist would be able to "localize" it with a minimum of telling strokes. Where various languages would have to be substituted in captions, the layout would allow flexibility for "long" languages as well as "short" ones in translations.

The SRI team is aware that USIA has curtailed its "pilot model" service, something like the "prototype" approach, in favor of "raw material" pamphlet packets. The team believes, however, that there is enough difference in the USIA and ITID operations (especially in kinds of material used and purpose intended) that the prototype will prove more useful than simply providing host countries with reference materials or summaries and seemingly unrelated pieces of art work. The prototype, if it is successful, will have utilized good professional editorial talent to do the basic job of organizing often complex and technical material into an effective presentation; very often, comparable editorial talent will not be available locally--and even where it is, it can be put to better use, if someone in the United States can do this job instead. It may well be, however, that certain supplementary material may be included with the prototype on occasion, when it is believed a particular country may want to go beyond the perhaps simplified material presented in the prototype.

The prototype, however, would be a complete production in itself--to be used without change where (a) it seems adequate for quantity distribution because English is understood and there are no great cultural problems, (b) it will have some value until the localized version is prepared, or (c) localizing would not be worthwhile, but occasional use might be made of the prototype itself.

In the case of pamphlet material, the prototype might be simply one large booklet, or a full-scale book if needed, with the local adapters breaking it up into separate pamphlets as seems best.

Although it is conceivable that a private contractor or an individual writer could produce a prototype for ITID, it is more likely that the editorial staff in ITID will develop--with the help of the Pool and the feedback--a special technique whose effectiveness will warrant internal production of the prototypes. It is, of course, still possible that the basic material might be worked up by a private contractor; and in the case of the Plant Requirements Reports or other standard series, once the prototype formula were established for that series, a private contractor could, of course, make additional reports to match.

In the underdeveloped country, the adapter might come from any one of a number of sources. The TIO himself could do it, although this is not recommended because it would preempt too much of this time and he would not be expected to know the local conditions as well as indigenous people would. A host-country productivity center or industrial institute would be an ideal place for adaptation. A private publisher might be even better if arrangements could somehow be made to insure quality and accuracy, and if he would undertake to sell additional copies on his own account.

In most cases, the SRI team observed, there is a scarcity of skills necessary to do the prototype adaptations fully. This means that training centers are required--but they are required in any case, and the prototypes will provide the most realistic kind of practice material for such training centers as are established for more general purposes. The team believes that, as a general principle, it is better to have a poor job done locally than have a highly professional training aid which cannot be fully understood and which irritates or at least distracts by incongruous cultural references or art work.

The question arises: "When should a prototype be prepared, and when should the matter be originated locally?" In line with Basic Principle Number 5, above, the matter must be decided on the merits of each case, with the determining factor being whether ITID's efforts will

save enough time, effort, and material in the host country to warrant. Considering that almost any technical aid prepared by ITID will have a certain applicability in at least several countries, the benefit of the doubt should be in favor of ITID production. The following specific factors, however, also will provide criteria to take into account. ITID production would seem to be preferable when:

1. Cultural differences to not substantially affect the contents or use of the industrial technical aid. (e.g., a film on oiling a motor, showing only hands and the equipment, is ideal, whereas films on social issues would be almost hopeless.)
2. The material can be used in much the same way and to the same purpose in various countries.
3. There is a minimum difference in the scale of operations involved in the various countries which might use the material.
4. Centralized effort would avoid duplication of the same effort at several field points.
5. The basic informational materials and the resources required for developing an effective treatment are not easily or widely available in the underdeveloped area.

One of the most important "prototypes" may well be existing materials which can be used in different ways. A few feet of technical film from a motivational movie can become a "film loop," as described later; a process description in a report from another country can become a manual; the series of Plant Requirements Reports, each intended to help design a new production unit, when used together can be a way to interest potential entrepreneurs in manufacture and give them a means of selecting which particular lines they would like to go into. On the same principle, while isolated and scattered reports of many types may be of little value, combined they become a known and useful source of information. All of this requires digging, of course, to find the materials, and skill to use them; the ITIO would be able to provide the ingredients, to obtain extra dividends from materials intended for other purposes.

Operating Guide No. 2--Translation. The use of prototypes immediately raises the problem of translating from English to the local language. This is a complex problem, because "translating" is far more

than literal substitution of equivalent words, even in technical writing, and particularly since motivational factors must take cultural differences into account. Furthermore, ordinary translators are not useful for technical subjects because specialists in the particular field are required to understand the subject well enough to make a useful translation--and "minor" deviations may make the whole attempt not only worthless but positively misleading, and can sometimes even jeopardize the whole project. But bilingual technical specialists are rare in these countries; it is, after all, an important purpose of the ICA program to help develop local technicians and experts to fill the great demand for them. Still worse, many of the local languages simply do not have the vocabulary or syntax to handle adequate translations of technical information.

Fortunately, it is becoming increasingly true that professional people requiring technical information can comprehend English. The SRI team believes, therefore, that insofar as highly technical scientific and industrial materials are concerned, there is less loss in communication by using the original English-language version than there is in trying to translate. The dangers of error seem to be fewer and less permanent, i.e., one man may misunderstand the English, but a text incorrectly translated into a local language may be used by many people for many years, even after the error is somehow discovered.

On simpler levels, an accurate translation of the language of technical information is most useful. Fortunately, the local vocabularies and translators are more likely to be available to handle the simpler levels. The SRI team was able to discern no correlation between the difficulties of a language or the number of translators available and the amount of translating being done. At least part of the obstacle is psychological in countries where adequate translation programs are not under way; the job seems staggering, and no one makes a start. The only answer to a translating problem, basically, is just to dig in and start getting translations. Certainly USIS has not been stopped by the problem of getting translations.

Budgets sometimes appear to be the stumbling block--but budgets merely indicate lack of appreciation of the importance of the matter. As a Lebanese put it: "You spend millions (sic) preparing technical information materials, and then try to 'save' the little extra money it would take to translate and make the original investment pay off." Certainly if the prototype technique is to be used by ITID, there will have to be understanding enough to allocate translation funds in USOM budgets.

The principle under which ITID must operate, therefore, is: There is no one, easy solution to the language barrier, and ITID must press forward with several solutions at the same time. Among them are the following:

1. Work to develop projects in host countries which will train writers, editors, and translators, so that the quality of translation will be adequate, in terms of both content and the tone of the approach.
2. Emphasize ways which can induce people to make use of English versions of technical aids.
3. Encourage in all possible ways the increased use of English in the underdeveloped areas.
4. Strengthen the host-country communication complex as much as possible, to provide the common understanding which makes it easier to comprehend the technical message, whether in English or the local language.
5. Keep in mind that materials already in existence in one foreign language may be useful in other places. For instance, Italian is useful in Eritrea; a pamphlet in Chinese could be read by the "Overseas Chinese" in the Far East. However, except as was noted above under "Regional Activities," there is little to be gained by ITID translation in Washington or a regional center ostensibly for various countries with nearly similar languages; local conditions probably will vary so much that the effort is not warranted.
6. Commission local-language and English technical dictionaries; ITID might well be able to do a prototype for this, i.e., the English part, to which the local language might be fitted in each case. (An international technical dictionary might be an alternative approach.)
7. Develop a local translators' pool, with USIS sharing in the names submitted.

These seven "solutions" are the general strategy. They are hardly spectacular. They simply say, get the best translations you can and work to make better translation facilities available. The suggestion that the use of English be encouraged in the underdeveloped areas may, however, raise a question.

The nationalistic feeling which is resurrecting local languages and even creating synthetic new ones is fully appreciated by the SRI team. The belief of many people that differences among societies, as among individuals, are to be encouraged and fostered has also been given due attention. Nevertheless, on its field trip the SRI team saw so many advantages and opportunities for the underdeveloped areas of the world in the use of English, that it believes it is only fulfilling its responsibility to state its conclusion and list the advantages (as well as the disadvantages).

1. Modern technology, which sends more and more people into foreign lands and which makes common understanding crucial if the world's security is to be achieved, increasingly requires either that many people be fluent in many languages or that all settle upon one second language which they can use in common--a world language. For historical and practical reasons, English is now on the way to becoming that world language. It is probably the foreign tongue most generally known and the second official language in more countries than any other. This is a trend gaining momentum, because the largest proportion of people going into foreign countries are English-speaking.

2. More specifically, by the fact that both British and American technologies use English, the English language has developed as the world's technical language. The real challenge to its universality is not in another major language--say even German, which once held the position--but in the fact that most of the new countries are trying to make their own languages serve technical purposes, dropping the English which they now use. It would be demonstrably easier for them to continue English than to make the change, except for nationalistic reasons.

3. Many indigenous cultures depend very little upon a national language, by and large, and for these cultures there would be little loss in adopting English. The net gain in the cultural riches and technical knowledge which would be opened up to them by the English language are enormous--far more, certainly, than is being gained from creating a national language.

4. In most instances, particularly in Asia and Africa, English has great advantages over the local language, albeit it poses difficulties

for an adult to learn. It is often a more precise, versatile, and flexible language, it simplifies communication (doubly important in underdeveloped areas), and it is easy to print because it has a relatively small alphabet and no accent marks.

5. Inasmuch as many of the communicable things the underdeveloped countries want from the outside world come in English--the world's news (Reuters, AP, UP, Time, and Newsweek), the Hollywood movies, American popular music, technical literature, comic books, official international reports, increasingly the world's popular literature--a new country builds itself up into the mainstream of the world much faster by making it easy to absorb all these communications into its society, when it adopts English as a second language.

6. The U. S., British, and other English-speaking merchant marines, the American and British Commonwealth business interests spread around the world, the fact that much of the world's commercial aviation network operates in English, have made English the dominant commercial language, and it is therefore profitable to the local businessman anywhere to be able to understand the rest of the world in its own language. Specifically, since the United States represents the luxury market, a country trying to capture it must understand English; the same applies to a country trying to capture the American tourist dollar.

7. Since many peoples are now being set about to learning some new language, they might just as easily be learning a language with a maximum of practical usefulness to themselves.

There are disadvantages to English. Its difficulty to learn--especially pronunciation and spelling--has been noted. Even more important is the emotional resentment against it because of its former identification with colonialism in much of the world. That taint has caused some countries to reject it outright. But what is worse, whenever English is proposed as the dominant language, it makes too many people think that it is an attempt to restore their colonial status.

It must be faced that American interest in English for underdeveloped areas may be attacked as a sort of economic colonizing. Nevertheless, the case can be made on grounds of the self-interest of the underdeveloped areas, and there would seem to be a responsibility to make such a case if an outsider is really trying to give helpful advice. Aside from emotional considerations (even though they cannot in fact be so set aside), it is possible that making English the "operating" language in an underdeveloped country would be the single most important action that could be taken toward making it a modern nation.

Operating Guide No. 3--Choice of Media. Because there are so many local variables, it is impossible for a central office to determine which medium will be most effective for a stated purpose; ITID must therefore make its media as flexible and interchangeable as possible, to allow local experts the greatest chance of finding the right material in the right form for the given need.

The manual, "Cultural Patterns and Technical Change," has a summarizing statement which explains the purpose as presented above:

"In the choice of methods to be used for introducing change, whether technical or compensatory, the criteria of involvement of the whole personality should be used. A great deal of discussion is wasted over the relative desirability of using print or radio, films or discussion groups, cartoons or dramas, practice or demonstrations or illustration, as ways of teaching new procedures and attitudes. These discussions tend to ignore the fact that all media for dissemination of new knowledge are to be judged in terms of effectiveness, and effectiveness in turn is a function of the extent to which the new practice becomes part of the way of life of the people among whom the change is to be introduced. Any reliance on a method which is purely intellectual, purely aesthetic, purely emotional, or purely moralistic, purely social or purely individual, will necessarily restrict the area of involvement. Whether, in a given culture, films or group discussions will evoke a more whole participation in adults or children, in the educated or the uneducated, on week days or on a holy day, are matters which have to be decided by experiment, with the full participation of the particular population on the spot. If this is recognized, preparation of teaching and demonstration materials will take the form of suggestions of ways of developing materials, rather than the provision of ready-made, rigid, untranslatable devices....."

Virtually no useful research is available in the underdeveloped areas to indicate the relative value of one medium versus another, e.g., are films or filmstrips better in a given situation, or should a particular kind of subject be taught by printed word or by oral presentation? The reason there are no useful data, and can be none, is suggested in the above quotation. There are simply too many local, changeable, undefinable, indiscernible factors involved to get conclusions that can have more than very limited meaning--unless one were ready to mount an all-out project that would dwarf anything attempted even in the U. S. (where the data are none too conclusive either). It certainly has an important bearing on a program such as that of ITID.

If a relative value could be placed on one medium versus another, it would simplify planning and budgeting. Unfortunately, the nature of man and communication, once again, indicate there is no easy way.

The SRI team believes that if ITID furnishes prototypes so designed that they may be adapted not only to local conditions in terms of content but also to use in various media, and if a full variety of media are also provided from ITID to cover the whole range of likely subject needs, the local channels will then have been backstopped enough to be able to proceed along the lines indicated by the quotation above. The ITIO, or whoever the local channel might be, would start with the needs, with the problem; armed with the aids furnished by ITID or otherwise obtainable, he would fashion the best available medium to satisfy the need. In terms of communication theory, this means starting with the "target"--who is to be reached, and why? Only after those questions are answered can the subject matter and the techniques be determined. Because this process can lead in so many different directions, only general principles can be applied to a central operation:

1. See that the entire subject-matter field is covered, in practical terms of what will be needed and useful.
2. See that all the levels of comprehension are served; even in the most underdeveloped areas, there will be some highly complex technical operations and some highly educated men requiring professional-level information.
3. See that the basic materials for all media and techniques are available, and if possible have materials so designed that they may be easily interchangeable.
4. Insofar as possible, any given medium should allow an overlap either way--for the less-advanced or more-advanced user--than the medium was designed for; e.g., a Plant Requirement Report, ostensibly designed for a certain level of productive capacity, would be more useful if it also indicated the possibility of a smaller and simpler operation, and of a larger one. This is because it is virtually impossible to judge exactly the level of the user, and unless the material has some leeway built in, he will feel it is either above him or below him, and thus may react against it as "useless."

5. Make it possible for one medium to reinforce another medium, because together they may succeed where either one alone could not. A film, for instance, may hold immediate attention but may not make specific points clear enough to assure retention; a pamphlet which the viewer can take home with him will reinforce the film, and the impact of the film will (usually) increase the use made of the pamphlet.

Operating Guide No. 4--Involvement of People. Technical information will be used more, and its use will have more lasting benefit, in proportion to the number of local people who are involved in preparing it and disseminating it. This principle is included because ITID would have responsibility for orienting ITIOs and could instill this principle into them for their own guidance in the field. Host-country people should be brought into the process, as much as possible and as soon as possible, in evaluating ITID's technical aids, adapting them, using them as they work on prototypes, for example. They make the product their own, and they proceed to see better to the utilization. This is no small by-product of the prototype approach, and it reflects a major precept learned through the years of operation of technical assistance programs: training of local people is crucial. Expert information is lasting only if it is transferred to host-country counterparts, for they have intimate knowledge of the local situation, they can better adapt to those local conditions, and they stay on the scene after the foreign technician leaves.

The principle generally is reflected in a potentiality already noted: As technical information is used by host-country people, and as they get involved, they eventually create an organization to handle the technical information, and thus another productivity center or technical institute is born. The ITIO will be better off for understanding clearly the value of his technical aids in achieving such a goal.

In one important way, ITID can adapt this principle to its own materials: involve top management, and then middle-management; they can then pass the information down, once they see its value. This means specifically that motivational material for top management must be built into any materials which they are likely to see.

Operating Guide No. 5--Determination of Subjects. For the same reason that it is next to impossible for a central office to determine the proper medium to use, it is almost as difficult to determine the

kinds of information which are needed. The SRI team believes the only feasible operating principle is this: be prepared to cover the whole range of industrial technology and all its periphery; in specific cases, be guided by advice from the field.

Part of this is dependent upon "feedback," which is discussed as a separate principle below; there is, however, a responsibility for ITID to initiate efforts to make empirical determinations. The Stanford Research Institute project, of course, was one such effort, and a list of hundreds of subjects is the result (shown in Part II). This list was carefully compiled from answers which officials and experts gave, directly and indirectly, to team questions to ascertain their needs. Nevertheless, no one should be too sanguine about the value of such lists. In practice, as much will depend upon the actual contents and treatment of a subject as on the subject itself--and the test will come after the material is prepared. Within broad areas, ITID would know from its general experience whether a particular subject would be useful. Beyond that, if a specific subject is being debated, ITID could initiate an airgram to poll the Missions; as has been indicated, the value of the response would depend upon factors not easy to check.

It is possible to suggest criteria, of sorts, for the development of new industries. (For example, USOM/Philippines limits its activities to projects which are dollar-saving or dollar-earning, which increase production and do not decrease employment.) It is possible also to suggest that priority should be given to projects which have tangible (if not dramatic) results ahead of others, or large projects rather than small, because the influence is greater; but this might be very misleading. And in any case, technical information is needed for the wide variety of technology which exists and is expanding, as well as for that which is just being started. The whole range is thus required.

There is an insistent request from planning and development officers in the underdeveloped areas for a way of determining what kinds of industry to foster, and in what order of priority. They would welcome a scientific formula that would work out an answer for them on a computer, taking into due account the pros and cons of various alternatives--with political and social consideration included. Of course, if such a wondrous formulation were developed, it would be a considerable aid to ITID in preparing materials to meet the needs thus established. Until such a time as this formulation is perfected, however, there would--again--seem to be no easy way to select technical aids subjects.

Operating Guide No. 6--Giving Service. ITID must be primarily a service organization--a "can-do" service, which gladly relieves the field of all the load possible. The various elements of this service are important enough to be given headings as separate principles, which follow, but the general point cannot be over-stressed: ITID must make clear in every way it can that it welcomes new ideas and requests for service, that it is operating quickly and accurately to provide industrial technical information.

In a very real sense, it is as important to administer technical assistance smoothly as it is to give it in the first place; if it is not properly given, its chance of being utilized is lessened. It is important that ITID backstop the field properly, so that when promises are made they can be kept, and when something is needed it can be delivered. Host-country officials who have tried several frustrating times to get information through ICA give up eventually and try elsewhere. Every man is a VIP to himself; if he gets less service than he thinks he deserves, he, too, turns elsewhere, and in a frame of mind which will not help the technological development program. What may seem a routine matter to a clerk in ITID may mean a career to someone in an underdeveloped area; the team heard of examples in which a question was asked but the answer came so late that someone else had already started a competing business and forced the questioner to drop the idea. These are human beings, and they should be regarded as ICA's "customers."

There is another entire sense in which ITID should see itself as a service organization: technical aids serve the experts. Having the technical information materials saves time and money by freeing specialists for their primary duties. The SRI team saw many occasions when a printed pamphlet which an Industry Officer could hand a visitor would have considerably shortened a conversation and achieved even better results. The hours wasted in a Mission developing material that could have been obtained through the Technical Aids Branch must be prodigious, if the examples seen by the team are any indication. ITID must strive to get across its concept of service to these experts--to encourage them to think of ITID and to use it, to save their time and energies.

Operating Guide No. 7--Urgency is the Best Policy. Information is a perishable commodity, and ITID must organize to process it quickly.

While it is also true of other things as well, it is clearly true of communication: if the needed communication is not at hand, there is no direction for action, so that nothing gets done or something gets

done wrong. It is perhaps more expensive to handle technical information as an urgent matter, but the SRI team observed that the result of not doing so was a far greater waste in the field. The real waste is in specialists sitting around and waiting for these materials, or laboriously (and less effectively) duplicating the work locally rather than waiting. The waste is in missed opportunities because they cannot act quickly enough, in momentum lost and new campaigns to recreate, and in the time-consuming task of reworking plans which must be changed because delays en route have wrecked established timetables. In the equipment field, there were even instances noted where an item was no longer useful at all because it had been requisitioned so long before that the project was ended and the specialist had gone home. At the very least, high turnover of personnel plus slow delivery equal inefficient utilization of materials when actually delivered. The price for penny-pinching on procedures and shipping is high.

The SRI team has two specific suggestions:

1. ITID should take the initiative to get air pouch and cable restrictions changed to allow their freer use for technical information materials. In particular, it should be made clear that films in any quantity may go by air pouch if the USOM has indicated the necessity. (The most consistent complaint the SRI team heard was that air pouch restrictions hamper the use of films.)
2. USOM Industry Officers should be asked to specify a realistic deadline for answers to their requests for technical information, and ITID should either schedule its work to meet that deadline or cable back immediately why it cannot be met and indicate when the material will be available. Every effort should be made to meet the original request rather than indicate the delay.

Operating Guide No. 8--Widespread Distribution. The cost of technical aids is low, compared with other parts of the technical assistance program, and specifically with the alternative of sending a specialist instead of a film or a pamphlet to convey certain information. Not only is the cost low per unit for the original use intended, but it is considerably lower for the production of additional copies to use for other purposes. In view of the great need for industrial technical information at almost any level, and of the difficulty of determining exactly where it will do the most good, the best way to insure return on the investment in technical aids is to make distribution as widespread as possible. These specific practices are recommended:

1. Every effort should be made to publicize technical aids materials as widely as possible. (As part of the problem of utilization, this is important enough to be shown as a separate principle: see Operating Guide No. 9 below.)

2. Technical aids materials--especially printed materials--should be considered highly expendable at the ultimate recipient's level. The material should wherever possible be given to a person as his own, not only to increase its motivational effect but because of the "multiplier" effect which may well result from the person's pride in possession and showing it around or using it later in other circumstances.

3. ITID should make certain that the USOMs or other recipients of materials direct from its office get as many copies of each item as they can use. Some Missions want many copies of everything, some want fewer--some want them immediately and some are in no hurry. ITID should take even more pains than it now does to determine requirements exactly (a procedure is suggested in connection with a new medium, the ITID Catalog, discussed in "Media" below) and to honor them.

4. At any level, and certainly on all printed matter short of books, providing officials with individual copies of technical aids is worth the cost as against circulating copies. The 1955 Frankfurt conference of European Technical Information Services brought out that when literature is circulated, it takes about one year before 20 readers have dealt with it. In terms of the urgency of communication in general, this delay simply is not worth the economy.

5. Every possible channel for distribution should be utilized. United States consulates and embassy reading rooms are useful places to put selections of technical information, yet the SRI team found that in many instances the officials themselves did not know of the technical aids program.

6. The Audiovisual Division is a particularly important channel of distribution; ITIOs or Industry Officers should take pains in the Missions, as ITID should do with OAVS in ICA/W, to inform them fully and to supply them with industrial materials for use as may develop.

7. "Out-of-print" should not be allowed to occur on items which have any continuing demand, and should not be offered as an excuse in any case. When a request for a specific item comes through, and it is unavailable immediately, a flat turndown is poor policy. A service organization finds an alternative: another publication, probably even a later edition of the material requested; a borrowed copy or information

as to where the inquirer can borrow one; an offer to mimeograph or microfilm the original if the need warrants. At the very least, the inquirer should be made to feel that the service organization is interested in helping him and wants to determine how great the need really is, as a basis for determining that should be done for him.

Operating Guide No. 9--Utilization Should be Promoted. While it is obvious that there is no purpose to producing something unless it is going to be distributed, so that it can be utilized, it does not follow in the underdeveloped areas that utilization is automatic upon distribution. For all the reasons made clear in the motivational discussions in this report, this operating principle follows: every effort should be made to promote technical aids materials, to achieve their maximum utilization.

In this sense, utilization includes distribution, particularly in the private sector. The ITIO must face the hesitancy that many business men have about using government services: they are afraid their business secrets will leak out, they lose face sometimes at having to "ask for help," and they know from past experience that one result of revealing business information may well be higher taxes for them. How he deals with particular individuals is the ITIO's problem, but certainly good backstopping from ITID in the way of quick service and high-quality materials will make his job easier.

It would clarify the TIO's position if an ICA Manual Order or some other policy directive were issued to make clear that it is ICA world policy to disseminate technical information as widely as possible and to use all appropriate means to achieve its utilization, unless there is an overriding local reason.

Specifically, also, ITID should help in the production of promotional materials for the use of ITIOs and other local channels, as discussed under "Media." More than once (and sometimes by government officials) the SRI team was told, "We can use all kinds of information, but we don't ask ICA because we don't know what to ask for; we have been laughed at when we ask for silly things." Catalogs, program descriptions, offers of service can overcome such problems.

It would be most helpful to an outsider, coming upon the proliferation of technical aids materials for the first time, to be given some better indication of the contents of the various media and their relationship to one another. Pamphlets in series should be clearly indicated as such, and numbered; the distinctions among series should be definite

and clear; materials should be internally coordinated, e.g., management booklets should refer to other series for engineers and accountants, describing them adequately enough so that managers will know whether they should obtain those materials as well. The lack of a publication date on materials adds to confusion and diminishes confidence; the reader cannot tell whether he has the latest information, or whether the material is current, and therefore whether he can act upon it.

One caution should be added: It is wasteful not to distribute technical aids; it is worse to promise to deliver something and then not to be able to keep the promise. Before there is widespread promotion of technical information services, the Mission must be certain it can deliver. In this connection, a commitment by ITID will be very important.

Operating Guide No. 10--The Package is Important. As American merchandisers have learned, packaging is an important part of selling. If technical aids are to be merchandised--i.e., if every effort is to be made to get them utilized--the format of materials is important, too. While this applies mostly to printed matter, it does have general application.

No set standard can be stated, because the whole variety of local conditions again controls. The SRI team heard arguments advanced from one extreme to the other: technical aids materials must appear as shoddy as ordinary local printed matter because readers will suspect them of being propaganda otherwise--or, conversely, technical information must be gaily packaged and invitingly done, to entice the reader. Providing for local adaptations as necessary to meet unusual conditions, the SRI team believes that, as a minimum, the following practices should be followed:

1. Materials should be produced in professional style and quality, as befits the dignity of the United States Government, but should never be more lavish than is actually required by the purpose.

2. Formats should be functional, rather than fit any preconceived pattern. That is, if a pamphlet is to be read under difficult light, the type should be larger; if it is to be subjected to constant use, the paper stock needs to be tougher.

3. Pamphlet covers should err on the side of overdoing, rather than underdoing, in terms of being made attractive to the particular readers being sought. One must be careful not to assume that present

practice within a country best indicates what people find attractive. In Indonesia, the Ministry of Education Printing Office has found that textbooks which, in their imaginativeness and functional beauty, are at the opposite from the stodgy standard practice of that country are being utilized much more effectively.

4. Techniques to make the contents more readable and more understandable should be fully encouraged. Obviously, carrying this to the point of distraction (e.g., sketches which only slow up the reader, for all that they are "arty") fails to make the contents "more readable and more understandable."

5. A printed piece for mass production is often produced more shoddily than a small-run piece, just to save the money, but this can be a false savings. Anything which is intended to reach large numbers of people must be of importance, and any one reader judges his own separate copy, not the total bulk. He should, therefore, receive a piece which is properly designed for the purpose, without regard to the quantity; anything less does not save money, but instead tends to waste the entire effort.

6. None of the foregoing should contradict the basic principle that materials must be within the framework of the people who receive them. Where local factors exist which affect format, they must be taken into account.

7. Damage in shipping can destroy all the good intentions of format and quality printing. The SRI team saw--specifically in Ethiopia and India--bundles of Technical Aids Branch materials arriving in battered condition, the packages broken open and covers and edges of pamphlets dirtied and crumpled. In this sense, printed matter is fragile, and should be packed and handled accordingly.

Operating Guide No. 11--Do Not Claim Credit. There are valid reasons for the ICA regulation requiring prominent display of the ICA shield on technical aids. The SRI team believes, however, that this regulation defeats its own purpose by its inflexibility. In some countries, the shield is useful and respected; it is even better when a joint shield is devised with the host country, and this practice is recommended wherever feasible. But in some countries, the use of the shield produces a negative reaction, jeopardizing the project being credited. The very existence of the regulation gives the communists a good talking point, that we are in technical assistance just for the credit, and to some people we appear even more materialistic as against their valued "spiritual"

character. If ICA's purpose is to help build a country, not simply to win friends for the U. S., the insistence on a way of "winning" friendship which defeats both friendship and more basic objectives is hardly good policy.

There are even more practical reasons. Because the shield is required on all tangibles, sometimes it is affixed in hurried, careless fashion, despoiling the dignity of the United States government. In many cases, the rule simply cannot be enforced: the Technical Digest can include the shield with each photograph, but it cannot compel a local editor to use the shield (as a matter of fact, the SRI team saw not a single instance in which he did).

It is recommended, therefore, that action be initiated to change the regulation so that the matter is left to the discretion of Mission directors. Insofar as Washington technical aids production is concerned, it is believed better to limit the credit to a simple line in modest type, in an appropriate place. (This also serves to identify the source of the materials so that no one can claim--the opposite of credit--that the United States is trying to slip something by without taking the responsibility for it.)

Operating Guide No. 12--Red Tape Must Not Delay Service. While administrative procedures are necessary, it is always possible to question where the point of diminishing returns lies. When is the gain from the procedure no longer worth all the trouble and expense it causes? Certainly, procedures set up to help achieve purposes should not be allowed to stand in the way of those purposes, and in a service organization--particularly one whose service is that perishable commodity, information--special effort must be made to simplify procedures internally and to work to remove administrative obstacles at every link in the chain. Following are specific difficulties hampering the free flow of industrial technical information and hindering its optimum use, together with recommendations as to what ITID might be able to do to help overcome them.

1. Internal procurement procedures should be simplified for informational materials. As it now stands, a single \$4 book must be requisitioned separately--at the cost of perhaps \$10 to \$20 or more in ICA paper work--and it may take up to a year to get the book delivered. It took one and a half years, from the point of agreement with the host country to the last delivery, to get seven management libraries in India. The Philippine Industrial Development Center had final approval in June 1955 for 120 films and still had not received them when the SRI team came through in February 1956. Unless there is a specific project to give

specific books away, not even a 5¢ pamphlet purchased by ICA can be given to anyone. Some arrangement is undoubtedly possible to simplify such matters--not only to expedite delivery of materials but actually to save the United States government a considerable overhead in red tape.

The Industry Officer in Indonesia is attempting to establish two modest funds--one for equipment and one for technical information material--on a trial basis. Automatic approval would be assured through procurement channels so that he could get immediate delivery (with requisitions following) on an ultraviolet ray tube which is needed before a major research project can continue, or on a book of special formulas which otherwise would hold up a complete ceramics program. Where no policy decision is involved, where maximums can be budgeted and the allocations left to the discretion of the action officer for spending, why should not petty cash funds be set up--or a fund be established in a United States bank, so that a simple check drawn against it could cover a small purchase?

Apparently, some of the difficulty at least lies in a breakdown of communication between the Procurement Division and the field. Procurement officials have told the SRI team that flexible procedures are now provided for such problems as these. Whatever the arrangement is, when the absence of an inexpensive item can delay major projects and make expensive specialists waste their time, some solution must be found.

2. ITID should help remove "trade barriers to knowledge." In too many countries of the world, customs regulations and other red tape serve to tie up information media shipments. As Unesco puts it in the foreword to its manual, "Trade Barriers to Knowledge" (second edition, 1955):

"One of the most formidable obstacles to the international circulation of educational, scientific and cultural materials is the complexity and variety of trade regulations in force in different countries, and the inaccessibility of data concerning them. Confronted with this maze of restrictions, many organizations and individuals have been discouraged from embarking on international exchanges of such materials or even their sale in countries abroad... These materials are desperately needed as aids in the cause of enlightenment, at a time when more than half the world's population is still illiterate, and vast areas, underdeveloped or devastated by war, lack the means to dispel ignorance...Whatever slight sacrifice (in revenue from customs) may be involved in freeing this sector of trade, it is more than outweighed by the enhanced opportunities for educational advancement and mutual understanding."

There is little that ITID could do directly to help solve this problem, except to urge ICA policy that no project with a host country is approved unless it is stipulated that technical aids required in the project are to be permitted immediate duty-free entry. Indirectly, it can assist by (a) reflecting the urgency of the problem in reports to higher echelons, as ammunition for the U. S. agencies engaged in working to remove the barriers, and (b) urging TIOs and the group engaged in developing the communication complex in a host country to work from that end to get the host country to ease restrictions on such materials.

There is a further, specific problem to which ITID should give attention. A shortage of dollar exchange in many countries prevents not only private citizens but even host governments from purchasing needed American films, books, and periodicals. Since the result is that either ICA must provide more or the people must go without the materials they need, it is clearly in ITID's interest to help solve the problem.

Two devices have been developed: the Unesco "coupon plan" and the U. S. Informational Media Guarantee (IMG) administered by USIA. The coupon plan is simple and useful but the funds behind it are limited, and the SRI team found instances in which even governments were having to wait months or years for enough funds to accumulate before they could purchase books. The IMG plan is not as simple, involving negotiations between the U. S. and host-country governments, and the initiative of U. S. exporters, plus a screening of the materials they propose to export plus arrangements for dollar exchange. Nevertheless, it has worked well in the relatively few countries where it has been installed. It is altogether possible that if ICA's efforts were added to USIA's, particularly through interest stirred up in host countries, IMG could be negotiated for most countries of the underdeveloped areas. Certainly, ITID could work through the channels recommended in this report--both private producers of technical information media and TIOs in the field--to increase the flow of such media. And if ICA were to approve the recommendation for a Coordinator for Communication Programs, in Washington and in the Missions, IMG could well be a major item on the agendas.

3. Proprietary rights must be clearly determined, and the use of proprietary materials facilitated. ICA should, of course, not only honor copyrights and patents, but should encourage similar practice throughout the world; there is no intent, in what is written here, to jeopardize private rights in any way. However, it may be possible for ITID to make clear to private producers of media that they are perhaps defeating their own interests by too closely limiting overseas use of their protected materials. In the first place, as has previously been noted in this report, insofar as overseas distribution of reprints of

printed materials is concerned, the attention which such reprints would get in themselves is a stimulus to sales. Secondly, in many countries it is difficult to prevent piracy, so that a liberal policy by copyright owners might yield them a little revenue instead of nothing, and at least create a precedent for respect of copyrighted materials.

ITID, therefore, working, as has been suggested, through the Private Cooperation Clearinghouse and in other ways, should try increasingly to get copyrighted materials available for free or inexpensive-royalty reprinting. If the Reprint Service and the Photocopying Service, described below, are undertaken, ITID must first come to some agreement with publishers.

Secondly, in the matter of films especially, ITID should see to a complete determination of secondary rights. It is already a practical question in some few areas, and will be a question in many more areas soon, as to whether the films may be shown on television and, if so, under what conditions. ITID should try to work for as simple and inexpensive an arrangement as possible, and should begin indicating clearly on a film or transcription which rights are granted and which are reserved.

4. Acknowledgment procedures should be fostered and speeded. When materials are requested from overseas, it should be part of the "service" assumption that the materials will be on hand by the date indicated in the request. In a smooth operation, nothing more should be needed unless the deadline cannot be met, and in such instances the inquirer should be notified as soon as delay is indicated. For the time being, however, in view of the somewhat haphazard situation overseas with regard to deliveries, it is believed useful for ITID to institute a procedure whereby an automatic acknowledgment would be made of every order which could not be filled by return mail. If at all possible, the acknowledgment should indicate an expected date of shipment. While all this may appear to be simply an extra procedure which in itself slows down the operation, it need not be formidable or formal (a post-card form will do), and its receipt overseas will enable the channel at that end to work out his plans more confidently and realistically. Eliminating the time lost and the frustration caused in dawdling over plans "in the dark" is worth the bother of the acknowledgments.

Operating Guide No. 13--Feedback and Evaluation Must Be Built In.

All channels of communication up and down within a unit, and back and forth between ICA/W and the field, should be kept open for feedback and evaluation, and full advantage should be taken of ways to make the feedback and evaluation automatic.

There is no need here to discuss the value of such procedures in making certain that service is good and that it corresponds to the needs. The following suggestions are made, however, to insure the fullest realization of the potentialities:

1. Keep informational channels (especially including ITID) as just that, and in no sense administrative or policing channels. The SRI team in the field got much more candid information once it could make clear that it was not there to evaluate the effectiveness of the operations, except as a basis for further planning. In some instances, the distinction was a little hard to draw. ITID, however, should have no trouble with its own operation if it is clearly divorced from any line responsibilities which could be misinterpreted by the field. Even the present responsibility for passing on film requisitions has a negative effect, because on occasion, the Technical Aids Branch must say "no" in a way that implies the Mission should have known better than to ask. If ITID has no responsibilities for procurement, as recommended in this report, if it can always be on the side of the requisitioner to help get him the best service that others will allow, a rapport can grow up between ITID and the field which will yield positive returns far beyond any conceivable loss from ITID abdicating as an administrative unit with power over Mission requisitions. ITID might still have to say, on occasion, "Sorry, but we can't get it for you"; however, that is quite different from having to say, "Sorry, but you can't have it."

2. Once rapport is established with the field, especially with ITIOs, Mission personnel should be encouraged to feel free to comment on ITID media and services, almost on a personal give-and-take basis.

3. The staff in ITID should establish regular analytical procedures to determine needs and trends from the requests and comments which come in. Specifically, a continuing analysis of the Technical Inquiry Service questions would help determine what new publications are needed. Perhaps a small but full-time research and analysis unit would prove useful.

4. The ITID Pool, operating on a very personal basis with its contacts in each country, would be ready-made to get a quick reaction to a knotty problem or a suggested new service.

5. The proposed ITID house organ would carry constant reminders of the feedback principle--not so much by preachments as by good example and by specific services, e.g., a standing column announcing publications to be reprinted because of short stock, and asking USOMs to indicate any criticisms or desirable changes and to notify ITID if any unusual quantities are desired.

6. An automatic evaluation form should be included with every new medium or service, particularly on contracted materials. It might read as follows: "This information was furnished to ICA by a contractor. Please give us an honest answer as to whether we have received our money's worth, and please indicate any corrections or additions you wish." This would serve three purposes: (a) to keep the contractor alert, (b) to guide ITID as to whether to use the same contractor again, and (c) to show the field that ITID is interested in quality and service.

7. The Director of ITID should make periodic trips to the field, to obtain a personal basis for judging the feedback and evaluation coming through channels. Probably he should also make an extensive trip when the ITID program is first announced full-scale, to discuss with key Industry Officers how the service might best be operated.

8. Perhaps in conjunction with the Director's trips, there should be regional meetings of technical aids personnel to determine new programs and to exchange techniques and ideas. These meetings would include host-country counterparts and technical information specialists. Provision should be made for a regular comprehensive view of the technical information program, to serve the same general function as this SRI project, i.e., assess the forest as well as the trees. It is believed, however, that a conference of international experts on the subject every few years will be more useful than another survey such as the present one.

Operating Guide No. 14--Develop a Comprehensive and Orderly Media Pattern. One way to determine gaps in a technical information program is to await inquiries and requests from the field. This, however, does not insure that all gaps will be recognized, even there, and often the requests come late. While evaluation and feedback must be provided for, as they have been in this report, there is need also for a comprehensive overview from a central vantage point to see what the pattern of service is; sometimes the gaps in service may show up in this way.

As part of its study, the SRI team prepared such an overview of technical aids services, and developed media to fill in such gaps as it found. The basic pattern, as developed, is included here to make clear the relationship of the particular media involved. It can, however, have an additional function, that of an operational tool by which the administrators concerned may constantly check their services to insure that no gaps develop as conditions change. A detailed analysis on this basis of the present Technical Aids Branch program is presented in Part II of this report for the administrative use of Technical Aids Branch.

There appear to be two distinct groups which ITID would serve, at least functionally: the "ultimate consumer" in the underdeveloped area and the "field service," both broadly conceived. There is an overlap, of course. First, the field service also is a consumer, at least of some materials. Second, a host-government official, for instance, may be the specific reader intended for a high-level pamphlet, whereas he is also part of the "field service" in the sense that he is part of the channel of communication by which ICA materials ultimately reach the private entrepreneur or other intended receiver. Nevertheless, as indicated, there is a difference functionally. The "ultimate consumer" uses the material for his own purposes; the "field service" uses it to help the "ultimate consumer" get it and use it. This becomes particularly important when media are intended to serve both groups; for instance, the present "brochures" describing the technical aids services offered through the Technical Aids Branch do not make the distinction and as a result are not satisfactory for either group.

Media for the Consumer. There are three basic categories of media by which the consumer may be reached: printed materials, audiovisual materials, and direct contact. This is somewhat arbitrary, since printed materials are perhaps audiovisual materials in one sense, and since both printed materials and audiovisual materials can be used in direct contact. Nevertheless, the distinctions are useful, and will be clear from the way they are applied below:

1. Printed matter--books, journals, pamphlets, etc. These are broken down into a comprehensive "Table of Industrial Technical Information Series" in Part II on "Subjects."
2. Audiovisual aids--films, radio, television, exhibits, demonstrations, filmstrips, etc. These are also included in the Table, where pertinent.
3. Direct contacts--the Technical Inquiry Service, photocopying operations of the Reprint Service, Product Analysis, etc. These are included in the Table where pertinent.

Media for the Field Service. The "field service" is a loose term, as used here, to cover not only the ICA field staff--the USOM personnel--but also the host-country personnel involved in the process of communicating technical information, from highest government officials through to the extension workers, and including also private channels. Insofar as these persons are technical aids consumers, they are reached by the three categories of media listed above. Insofar as they are the field

service per se, they require quite a complex of channels and media, in various directions. It is significant that the field service is the area which presently has the greatest gaps (in channels as well as in media); it is an indication that the process of communication and the needs of that process have not been fully appreciated or met. Here are the media required:

1. Media carrying technical information to be disseminated to the ultimate consumer. In a sense this includes the whole range of media which require only simple transmission--films, pamphlets ready to be handed out, a library for a government ministry, etc. However, more importantly to the present consideration because so much material must be prepared locally for the underdeveloped areas, this category includes the materials from which the field service will itself prepare technical aids for the ultimate consumer. This means prototypes, reference materials, reports (e.g., from the Pool), and other background information.

2. Media helping in the utilization of technical aids, or media helping the field service do its job of communicating. This includes promotional or motivational materials and instructions or guidance in techniques of applications. Catalogs, promotional pieces, a house organ, manuals on adapting prototypes and on using audiovisual aids are in this category.

3. Media to aid, formalize, and simplify the channels through which technical information is obtained, processed, and carried for utilization. Here are most of the missing channels--the Pool, the editorial staff, indeed the enlarged ITID itself, the pertinent parts of the communication complex in the underdeveloped areas (e.g., private trade associations), the ITIOs, private American suppliers, host-country productivity centers or industrial technical institutes. Among the media involved here are conferences, reports, personal contacts, house organs, manuals, and catalogs.

#### Guidance for the Editorial Staff

During the course of the project, the SRI team collected a number of techniques, warnings, themes to "sell," and technical media production suggestions that appear worth passing along for the possible guidance of ITID's editorial staff. This is in no sense a manual of such matters, or even an exhaustive list, and it may be that in particular instances the suggestions will not even apply. Among hundreds of possible pointers which were mentioned however, these have been gleaned to submit here because they appear most generally applicable and useful under varying circumstances.

1. Communication must always be on the level of the intended receiver. What the sender thinks a word means is not part of the message as received; the message will be in terms of what the receiver thinks the word means. Similarly, what counts is not the color of ink the creator of the technical aid thinks appropriate, but rather the color which the viewer thinks appropriate. If the person preparing the technical aids does not know how the user is likely to react, he ought to check his work with someone who does.

2. If the knowledge of the people of the underdeveloped areas is not to be overestimated, it is not to be underestimated, either. The people have learned much, although the context is different than Americans understand. The problem is to get them to apply their knowledge to the new knowledge which is being offered, to relate the two so they can absorb the new. This requires that the creator of the technical aid must learn their knowledge.

3. Because in underdeveloped areas there is often less willingness to learn, less understanding of the value of knowledge and of change, and less recognition of the need to change, technical aids must have a built-in motivational appeal. This starts with built-in reader appeal. Make sure from the beginning that the reader (or viewer) knows why it is important for him to pay attention, which means he must be very clearly shown that what is going to be suggested will be of direct benefit to him.

4. Show the user that "fate" can be overcome--that the technical aid is describing something which he can do, and which other people have done. In this connection, and as a moral to almost any report of what has been done somewhere, there might well be a message to this effect: "You can do this, too."

5. Make the tenor of approach within the text: "We think this is something you will want to take advantage of."

6. Many people of the underdeveloped areas resent, at least subconsciously, U. S. technological superiority and their need to rely on U. S. assistance. Technical information media cannot be condescending in any way; if the user honestly feels the material meets him as an equal, the transfer of information will come more readily and easily. Perhaps the approach is to say: "We had this problem in the United States, and after many errors and much experimenting, this is the best solution we have found to date. Maybe your problem is related, and maybe you can use this answer, or use it to find a better one."

7. Avoid irritants or distractions in materials, such as unnecessary references to alien customs or religions, to American "superiority," to dates which cast doubt on current usefulness. Even the use of names in reports and talks distracts from the main subject--and may be bad politics.

8. Materials must be attractive enough to achieve voluntary attention; when it is necessary to force their use (as a management may require foremen to attend an in-service training course) they have lost much of their impact and their multiplier effect.

9. The way a message travels from originator to receiver through the transmitter is long and tortuous. A person who prepares a technical aid must try to bear in mind all the pitfalls and avoid them as best he can.

10. Where possible, rough drafts of prototypes should be checked for general suitability by the ITID Pool or by competent persons in the field.

11. Stress at every opportunity within the technical aid that the material or advice contained is subject to local conditions, and that therefore the user should obtain competent local advice before he proceeds with a project on the basis of the information provided.

12. It should be emphasized all along the technical information channel that technical aids should not be used by technical information personnel to compete with professional people earning their living by providing comparable services--e.g., engineers, architects, accountants, and consultants. Actually, such persons should be used locally wherever possible in the adaptation of prototypes, and they should be involved in spreading their knowledge in all other possible ways.

13. Always observe the local way, and go along with it unless absolutely impossible. It is usually better to get local cooperation to satisfy wants inefficiently than to try to force through an efficient way.

14. The people are intelligent enough to work out the practical details of application for themselves, once they see the principles involved. As a matter of fact, because of the complexity, only they can work out the practical details. The thing to do, therefore, is to concentrate on principles--on getting them really to understand the basic idea or operation.

15. It is usually better to deal with only one purpose per technical aid, and that probably means the main problem must be chosen because (a) it is the one with the greatest self-interest and (b) full opportunity should be taken of the relatively few chances to reach someone.

16. There is nothing to be gained by advising people to use, or teaching them to use, machinery, processes, and equipment that are beyond their means to obtain; it is wasted effort and only frustrates them. But there is always something more that can be done with existing equipment, or with slightly better equipment which is attainable.

17. Ideally, no action should be suggested which the audience cannot go out and do for itself.

18. Anticipate and avoid the reaction, "American practice is too far advanced for us to emulate," by putting the technique in local context or showing at the outset that this is something another underdeveloped area has already found possible. The use of pictures from different lands, instead of the U. S., helps in this regard.

19. Especially in lower-level materials, the reader is probably basically more involved in agriculture than industry; he is often an industrial worker only during the off season on the farms. Technical aids perhaps should have more farm orientation.

20. While the U. S. is labor-saving in orientation, the underdeveloped areas are material-saving. Technical aids must always reflect an awareness and an understanding of this difference, particularly in its implications for unemployment, but must try to change that thinking, as basic to technological development. Perhaps the approach is to say: "If you make this improvement, you will free a man--free him to do something else more valuable in the plant."

21. The culture being advanced by technological change is not "American" culture--it is technological culture per se which is being advanced, and it will be indigenous to the underdeveloped area as it is adopted and adapted to meet existing cultural patterns.

22. Stress the contribution which the local intelligentsia can make, pointing out that while any technological change or any other innovation will affect the culture, it is something which the local intelligentsia no doubt will best be able to tie to existing culture and make their own. It is their role, in other words, to keep their society healthy and strong as it changes.

23. Bearing in mind that a little learning is a dangerous thing, stress to users that what they have learned here does not make them experts, and that even if they know the one field now, they must see its relationship to other fields.

24. Inspirational methods achieve more than mechanical rote teaching, especially in view of the need to emphasize principles rather than specifics. Accordingly, technical aids must be kept imaginative, creative, inspirational.

25. Because the users are people dealing with human problems, the material will establish rapport faster and better if it is itself more human, more understanding of human problems, and perhaps more lively (which often may well mean more humorous, or at least less dull).

26. In prototypes especially, allow for localized examples, and select examples which can easily be adapted.

27. Reference to local projects in which there is great pride--a major dam, for instance--can stimulate motivation in other subjects.

28. In the underdeveloped areas, as in the United States, material addressed to "you" is generally better than the impersonal.

29. A technical medium can be criticized on at least three levels: (a) whether it is good by absolute American standards, (b) whether it is effective among the people who use it or for whom it is intended, and (c) whether it meets the broad objectives of ICA. The first criterion is important because it is impossible to anticipate every use to which the material will be put, and media should therefore be as well done as practicable for all contingencies. However, when criteria (a) and (b) are in conflict, criterion (b) should control.

30. Titles should be provocative and stimulating, but above all they should be indicative and not misleading.

31. Technical aids material must be of high quality in format, particularly for use in cities and particularly when it is designed for management or host-country officials, because it is competing for attention with other media from other sources, even in the underdeveloped areas.

32. If it is a question of erring one way or another, err toward the higher quality in terms of format, and toward simpler presentation in terms of content.

33. Local conditions affect mechanical considerations, and must be considered as controlling. For instance, coated printing paper sticks in humid climates, and should not be employed for materials which will be used there. Glossy photographic prints likewise stick; for prototype art work, especially if there is any quantity, it is better to provide reproduction proofs by fine-screen offset.

34. It is possible to be too clever in a technical aid, and thereby distract the user from the primary purpose of the material.

35. Layouts must be kept simple and easy for the eye to follow; artistic conventions (such as arrows, and electric light bulbs to indicate "Idea!" in a cartoon) are seldom understood and should not be depended upon.

36. Even though it is intended that a technical aid for school use should be utilized only as an audiovisual aid, it is nevertheless realistic to prepare it in such a way that it can stand on its own feet, because teachers simply will not be available in some places. Technical materials therefore, must be carefully prepared so as not to be misleading. They must be simply worded and illustrated to be fully understood, and must have built-in motivation to insure use.

37. All materials should be as self-contained as possible, i.e., it should not rest upon information which must be obtained elsewhere, because people usually do not know how to use reference materials and cannot get to them easily.

38. Any material of any substance which can conceivably be used for reference should have a good index. This includes more materials in an underdeveloped area than in the U. S., because of the scarcity of standard reference materials.

39. On many printed aids, the title page can spotlight specific interests served by the contents, to make clear to the potential user that there is direct value to him in it. The device need be no more complex than a heading,

"If you are a

CARPENTER, see pages 13, 35, and 62

PAINTER, see pages 12, 14, and 18,"

etc.

40. All technical aids should attempt to get the user to seek further information. On all promotional-type materials, and on others which could conceivably prompt further inquiry, a boxed area should be left on the front or back cover so a rubber stamp can be used to direct the user to the USOM, productivity center, etc., for further information.

41. Technical aids should be so designed and packaged that they are easily adaptable to use in other media. For instance, while all drawings cannot be the proportion of a filmstrip frame, it would nevertheless be a good idea to use that proportion for a booklet illustration whenever possible, so that it could be adapted to a filmstrip.

42. When the material requires quite different handling in different media, but the different media might all be useful, then the material should be developed into each of the media, rather than selecting just one medium and forgetting the others.

43. Each technical aid should be considered part of the over-all program, and should have built into it any useful reference to other technical aids, e.g., a Plant Requirements Report might well refer to a film which is available on a related subject.

44. Make sure the technical aid will be acceptable to the top man in any organization, because very often he will have to be the channel through which it gets to the intended user; this may often serve to make him also a user of the material before he passes it along.

45. By the same reasoning, when materials are developed for an intermediate level, design other materials which can be given to the higher echelons to pave the way for carrying out procedures discussed for the intermediate level. For instance, when conference materials are prepared, a summary sheet which is slanted to the boss and can be given to the boss by the subordinate attending the conference, will help the conferee achieve the program outlined at the conference.

46. Specifically, the technique of a promotional campaign can be applied to important matters in many cases. Materials should be provided to tie related media together--e.g., a poster to announce availability of the technical aid, announcements also through press releases, on the radio, or at the cinema or possibly through paid newspaper advertising--in a genuine promotional effort which begins with advance stimulation and ends with a tangible reminder left for afterwards.

47. While American advertising and promotional techniques cannot be used indiscriminately in underdeveloped areas, the principles involved nevertheless often do seem to work where intelligently applied; they ought at least be kept in mind and used as a checklist.

48. Try to achieve a "multiplier" effect with each technical aid. Make it something that the user will pass on to others, or that will make him take an action that will spur others to action. At the least, make it something that will get him to think more and study more.

49. Where possible, an expendable, inexpensive, and tangible summary should be made of media which are impersonal or transitory--a film or an exhibit--so that the individual may have something to take away with him, to remember by, and to study further. For instance, a pamphlet repeating the frames of a filmstrip or film, with explanatory texts, will be useful later if distributed at the showing.

50. Whatever other media are used, it is probably a good idea also to provide the material in a printed form of some kind, especially if it is in English--so that the reader can study it at his leisure, at his own speed, and without worries about pronunciation.

51. Ideas comparable to the school-book maxims of America's past often can usefully be sprinkled through the texts of technical aids: "Keep your place neat," "Look for ways to improve operations," "Safety pays," etc.

52. Every opportunity should be taken to stress good management practice, democratic processes, simplicifation, standardization, and specialization in industry.

53. Suggest "gimmicks" that may pay off. For instance, perhaps encouraging a workman to put his name on the product he helped produce might (a) increase his sense of status as an individual, (b) show him he is doing useful work, and (c) stimulate his literacy, if needed, at least to the point of being able to write his own name and read the names of others.

54. Be careful on material which might cause pressures on host-country governments--e.g., a book on tax structures, which might advocate a different kind of tax than the finance minister wants. This is not to say such materials must be censored out; it is simply that the decision to use them must be made consciously in view of all the considerations involved.

55. Use pertinent pictures only, but as many as possible of these.

56. Cartoons have great interest once they are understood as caricatures; it is probably not a disservice to a culture to introduce the cartoon to a country which does not now use it, because it greatly stimulates the desire to read and it facilitates understanding of printed messages. Great care must be taken with the comic element, however, for what is humorous to some is not to others. Use the advice of local people.

57. Stress the value of standardizing local terminology, and use the technical aids themselves to help do this. For instances, in Iran, if there were no training manual on auto lubrication, there would be a dozen different names in Farsi for "crescent wrench;" the manual has made them settle on the English term.

58. Graphs, maps, tables, and other devices should be introduced in simple form wherever possible, to begin teaching people to understand them in more complex forms.

59. When a soundtrack accompanies a filmstrip, any wording on the screen and in the sound should be the same; different texts at the same time are a distraction.

60. Different peoples have different thought processes; some are analytical, some abstract, some concrete, etc. This may affect even seemingly small matters such as how pamphlets are divided into chapters and subdivided. While it is impossible to match all these processes, at the very least the materials should be kept as simple and direct as possible, without flashbacks or other incursions which might mislead the mind.

61. The shorter and simpler, the better.

**PART II**

**Sections VI and VII**

## Section VI

### MEDIA

This section of the report offers detailed recommendations concerning both the media presently distributed through ICA's Technical Aids Branch and new media which might augment the service of that Branch.

The SRI team has made every effort to provide observations and conclusions in such detail as to be helpful in policy decisions by the TAB on the future course of existing media and services. However, the following is in no sense a detailed critique of each individual technical aid. An adequate evaluation of that sort would be a major undertaking in itself, and would be largely unproductive unless the TAB had an editorial department prepared to follow through with detailed changes. It would appear to be a better practice to develop such an editorial department in due course, along with the Pool, as recommended in this report, and then make it an early assignment for those two units to systematically review and revamp existing media and services in the light of their combined experience.

The discussion in this section is a specific application of the pattern presented in the previous section. As indicated in the discussions, various media can be used for more than one purpose, so long as the purposes are compatible and clearly recognized.

#### A. Printed Series

##### The Technical Digest

This existing service provides a monthly publication of technical articles (digests, summaries, and special articles) to all ICA countries, to serve as a basis for transmission of current U. S. technical developments in processes, products, work techniques, managerial techniques, and factory organization. Inexpensively produced on Multilith, with glossy prints of photographs, it is sent, a few copies to a country, for reproduction there in quantity if desired, although copyright restrictions on certain materials complicate this process.

Under present circumstances in the underdeveloped countries, there is some doubt whether the Technical Digest can serve its intended purpose adequately.

As can be seen, the Technical Digest covers a broad range of subjects, and has been attempting to broaden the range of readership levels as well. It is increasingly unlikely, therefore, that any one user except a channel for redistribution of its contents (i.e., a USOM, productivity center, technical information institute, etc.) would be interested in the entire publication. Its value for reproduction in toto in any given host country and distribution to the industrial sector is very low. If, however, the channels for redistribution were prepared to utilize the contents of the Technical Digest by translating and reproducing parts of it separately and distributing these reprints to potential users, it could still have great value. In the underdeveloped areas today, such utilization is at a minimum.

For the future, however, there are many possible developments which could directly influence the use of the Technical Digest. Some of them depend upon recommendations in this report. These are among the potentials and implications:

1. If the ITIO program is developed, the Missions will have an officer who could make it part of his business to stimulate use of the Technical Digest by furthering the translation, reproduction, and distribution of pertinent articles to potential users.
2. If technical information centers and extension services develop, the job of the ITIO in connection with the Technical Digest would become easier, and the Technical Digest probably would be utilized more.
3. However, if the alternative journals proposed below--the Management Journal and the Development Trade Journals in such specific fields as ceramics, textiles, etc.--are begun, there would be no need for this omnibus Technical Journal. It would be, in effect, split up into cohesive subpublications, each one with a reasonably clear-cut audience.
4. Specifically, if the program recommended earlier for increasing private subscriptions to American trade journals is successfully initiated, the need for the more technical articles in the underdeveloped areas may then be largely met. The users of this level of information so generally read English that it is doubtful if a widespread translation program would be warranted. As is now done with the Technical Digest, ICA/W should work out arrangements with American publishers so that particular trade journal articles might be translated when a national productivity center, for instance, found them of special interest.

5. If the Technical Inquiry Service is expanded and improved, as recommended, and if the Reprint Service in connection with it is adopted, material of direct use to specific Missions can be developed to serve the same general function as the Technical Digest.

6. If the Industrial Information Pool is developed, it will produce much material that will require dissemination through some medium. The separate Development Trade Journals and the Management Journal would be the ideal publications for such materials. However, if the recommendation is not followed and these publications are not created, the Technical Digest may be the only available pertinent medium.

There are thus many alternatives, resting upon many undetermined factors. Under the circumstances, it is recommended that the Technical Digest be retained in generally its present form until such a time as the scope of the Technical Aids program is determined--i.e., the degree to which the general program recommended in this report is adopted. The decisions as to whether there will be ITIOs, whether there will be a separate Management Journal and Development Trade Journals (the latter based upon an experiment), and decisions on other recommendations, will in themselves determine the need for the Technical Digest as such.

Meanwhile, the SRI team has these specific observations concerning the Technical Digest:

1. The photographs as presently provided on glossy stock do not take full advantage of the money spent on them. Far too much "white space" is wasted. If the ICA shield beside each photograph were eliminated (it is meaningless because it simply is not used by the reproducer), and if the photographs were blown up and sometimes "cropped" or otherwise planned for the available space, the details in the photographs could show up from two to four times as large, and thus insure vastly improved reproducibility in the host country. Since the details are usually the reason for the photographs, this is an important consideration.

2. On the first inside page of the Digest, a table is needed to show readers on various subjects just where they will find items of interest to them, e.g.:

"If you are interested in

PLASTICS, see pages 3, 7, 39, 54

WOODWORKING, see pages 5, 38, 63,"

etc.

The team recognizes that one theory of the Technical Digest is that a reader will go through the entire publication and find ideas in articles which might normally be outside his interests, as a matter of cross fertilization. However, in the underdeveloped areas, at least, this is largely a forlorn hope. It is only realistic to recognize the Digest as an omnibus service, and at least to direct readers to pertinent pages; otherwise the pages will have few readers at all.

3. If the Digest is to be continued, it should have a good, comprehensive index in each issue, and a cumulative index each year.

4. For the purposes of indexing in USOM files, Technical Digest articles should be considered the equivalent of Technical Inquiry Service answers, for the most part, and their titles and numbers be put on index cards and otherwise indexed in the same way. OTS should have responsibility for doing this and integrating it with the Technical Inquiry Service. (In some USOMs, a copy of the Digest is now being broken up and its component articles individually filed along with Technical Inquiry answers.)

5. The Technical Digest should show, in each issue, available indexes and digests which might lead to further information--e.g., Industrial Arts Index, the McGraw-Hill Management Digest, the various EPA Technical Digests (showing the various languages employed)--together with a brief description of how they might be obtained and used. This will be particularly useful if the Reprint Service is adopted, as recommended below.

6. The position of the copyright notice to accompany reprints of articles from the Technical Digest is confusing. The notice can be omitted too easily, if unwittingly, by an editor. To protect fully the interests of American publishers, the copyright notice itself should be placed below the heading of the specific article instead of above it. The explanatory note to editors who use the Technical Digest perhaps should remain above the title, where it now is placed as part of the copyright notice.

7. Many USOMs seem unclear about how many copies of the Digest they might be allowed upon request. Some could use more than they presently receive, to circulate among their own technicians to keep them up to date, to furnish to specific important contacts in the host governments, etc. A clarifying notice of some sort should be issued. If the house organ is established as recommended, this would be one of its uses.

8. Many USIS libraries would welcome the addition of the Technical Digest to their shelves. The USOMs, when being circularized about the number of copies desired (see No. 7, above) might be given the suggestion that they check with USIS libraries--and other libraries and likely reading centers such as U. S. consulates--as to whether they might desire copies.

9. In terms of contents, the SRI team often heard suggestions that Technical Digest articles should be chosen to seem more personal to the reader, to stress how the information can be used, to tell the results of experiences of others, to include brief case histories of small U. S. firms which grew through application of the same principles which the underdeveloped areas must adopt, and particularly to include more on the very small industry. Other things being equal, the selection of subject matter ought to take into account, if possible, the needs of the various countries in terms of their relative importance, e.g., India's needs might warrant more Digest articles than those of a small country.

10. The copyright restrictions on reprinting are a limiting factor, and something should be done. Perhaps it would be feasible to approach American publishers--as recommended earlier--through some such agency as the Private Cooperation Clearinghouse to ask them to grant republication rights of any materials in their journals to the publications of a list of the official productivity centers and technical information institutes in ICA countries. The reproduction would be limited to their own official publications, with due copyright notices; and it might be reasonable to stipulate a maximum of, say, three articles from each issue, averaged over a year.

#### New Monthly Publications

As noted above, the Technical Digest is considered to be spread too thinly to serve any one group adequately. Because it must cover all groups, it cannot include certain types of "service" information (announcements, book reviews, conference reports, etc.) since it would be far too voluminous if it covered each interest in the same way.

One alternative, detailed earlier in connection with stimulating private efforts, is to substitute a commercial publication. Another alternative is to split up the Technical Digest into separate major subject-matter publications, so that each can "do a job" for its own field. The following publications would appear to be useful:

Management Journal. This would be a "horizontal" publication cutting across trade lines, to serve the underdeveloped areas' budding management profession and existing entrepreneurs, who must develop managerial skills quickly.

Development Trade Journals. These would be "vertical" publications for each of such trades as woodworking and wood products, ceramics, leather, textiles, metal-working, food processing, chemicals, rubber and plastics, electrical, automotive, transportation, printing, and construction.

Their subject matter would include:

1. Articles of pertinent interest prepared by the Technical Information Pool in ITID, selected digest-type articles from anywhere in the world, and summaries as in the present Technical Digest. These would emphasize practical answers developed in or for the underdeveloped areas to the problems in the specific field.
2. Reports on projects under way or newly completed, including research.
3. A department on development steps and techniques which might be applied to stimulate private capital to start plants. (The Indonesian government is understood to be planning a monthly journal on this subject alone.)
4. A standing column of unanswered questions, not unlike the Technical Inquiry Service, in which readers would be asked to supply answers or leads to answers. This would supplement OTS and the Pool by reaching into areas they could never hope to cover.
5. Book reviews, in enough detail to provide technical information, and bibliographies.
6. Announcements of coming conferences, and reports of recent conferences.
7. Announcements of available technical aids materials and services, such as those of ICA and of host-country information centers.
8. Spot news items in the field, personnel changes, new plants started, etc.

The Management Journal, having approximately the same departments as the preceding journals, could include articles on safety, materials handling, accounting, personnel, maintenance, and supervisory training-- although it is conceivable that as interest in these subjects grows, some of them might warrant separate publications.

It is manifestly impossible for the Technical Digest to cover adequately the subjects listed for these new publications, yet they are all of direct benefit to the industrial technical development program. There are no commercial publications which now handle these fields. The new journals proposed in this section are not likely to be started without ICA assistance or prompting, and it could well be that if ITID started the publications recommended below, they might later be taken over as commercial ventures.

It is suggested, therefore, that the Management Journal be started, with the help of some such U. S. organization as CIPM or IMA. This might be done on a contract basis, as a one-year experiment. Such decisions as whether there should be paid subscriptions or free distribution, and how the staff might be handled, could best be worked out between the Technical Aids Branch and the contractor. It probably would be well to conceive of the publication as one which would serve basically the English-reading managerial class in the underdeveloped areas, although host-country agencies might translate and reprint all or part of the publication if useful.

It is suggested that one experimental Development Trade Journal be initially established, perhaps in a field such as ceramics or textiles, to determine its feasibility. If the Pool and an editorial department are established in ITID, it would be preferable to conduct the experiment within ICA, inasmuch as no industry group in the U. S. appears to be presently set up and oriented in underdeveloped-area problems to take on the assignment. Eventually, if it is determined that a series of such Journals would be useful, some contract arrangement might be feasible. Like the Management Digest, this Journal would be written originally for the English-reading people in the field, although it is likely that an indigenous organization such as the Ceramics Institute in Indonesia, for instance, might find such a Journal worth republishing in Bahasa Indonesia.

#### Plant Requirements Reports

Plant Requirements Reports are designed to provide specific information needed as guidance in establishing and operating a new plant or to improve the equipment layout or processes in existing plants. These reports are aimed primarily at the potential investor, the individual in

an underdeveloped economy who has the capital or resources but does not have the kind of managerial know-how or technical engineering skills available to go ahead with the building of the plant. In practice, these reports have been found to be useful also to potential investors who have a desire to start an industrial enterprise but do not yet know enough about industry even to decide the type of product they might manufacture. After seeing the possibilities suggested in these reports and studying the operations described in them, the potential investors are sometimes aided in making decisions at least to the point of pursuing a specific type of manufacture in greater detail. The team also found instances in which the reports were useful to engineers who had to deal with the subject even though their training was in other fields.

The field gave mixed opinions as to the value of these reports, although the program was still so new when the SRI team was making its study that no firm evidence was available as to their usefulness. (The first reports were distributed in March 1955, and the bulk of them did not reach USOMs until late Fall of 1955.) Nevertheless, it is clear that the reports serve a definite need--a need so broad that almost every USIS and information center librarian, when told of the reports, indicated a desire to have a set for the library's use.

Specific criticisms are reflected in the following suggestions for improving subsequent Plant Requirements Reports:

1. Alternative processes, materials, and equipment should be listed to give the potential investor a choice as to the type and size of plant which would meet market and other conditions prevailing in his particular situation. These alternatives should be aimed at the typical operating conditions in underdeveloped countries, i.e., limited capital supplies, small uncertain local markets, cheap but untrained labor, inadequate transport, and local raw materials which may not be of a quality available in the more advanced countries. This is suggested to meet criticisms that the reports are limited in applicability at present because they provide only the "economic minimum in size which utilizes suitable equipment and methods," based on U. S. techniques and standards. United States practice often is not applicable to conditions which generally exist in underdeveloped areas. In addition, different users might want a plant larger than the "economic minimum" even if it could be established in terms of underdeveloped-area conditions.

2. The reports should be more simply written and organized, and better illustrated. Sometimes processes are described in such detail as to confuse, whereas other reports assume too much technical knowledge on the part of the reader. (A "Johnson joint" or some other such term is

casually mentioned; at the very least, a glossary should be appended in reports where these terms are required. Similarly, conversion tables for weights, measures, and currencies should be furnished in many instances.) There were some few criticisms of simple inaccuracy, which might have resulted from poor proofreading.

3. The reports should show the potential investor the implications more simply and meaningfully. For instance, total costs now omit certain items which cannot be determined in advance, and although this is indicated in the text, the "Total" figure as shown is likely taken by the uninitiated reader to include, literally, total costs. Because any "total" figure shown may be used without qualification, it is better not to strike a total at all if any of the components is missing. A reader who does not fully understand industry may take "plant requirements" to mean the physical plant only, as shown in these reports, whereas realistically he should also include the costs involved in such other requirements as marketing, management, finance, engineering, and research. Perhaps a check-list should be included to call attention to these and such specifics as amortization, equipment transportation charges and duties, taxes, and interest.

4. The reports should indicate how it might be possible to diversify the products of a plant in order to make operations more economical under restricted local conditions. The versatility of various equipment should be made clear, as part of the data for deciding how to equip the plant. The possibilities of importing semiprocessed materials and treating them instead of attempting to make the entire process from scratch should be made clear, e.g., making bicycle frames and assembling bicycles, but not attempting to make the gears, tubular steel, etc., which might better be imported.

5. Case studies of actual plant erection and experience in countries with other than highly industrialized economies should be included whenever possible. (The ITID Pool can be of help in this.)

6. The reports should lay greater stress on information which will assist existing plants to improve their operations and to make them more efficient.

7. References to United States conditions which are not to be found in most underdeveloped economies should be omitted. Not only is it wasteful and confusing, but it serves to discourage a potential investor. It should be remembered that, because of the way the reports are often used as the first contact with a man who could become a potent force in the economy, the reports may be quite harmful if not carefully prepared.

8. The reader should be clearly advised that the report is only a guide, not a final authority, and that the advice of a competent engineer should be secured before proceeding with any significant commitment of time or money.

9. Sources from which the reader may obtain additional information on the particular industry, such as technical manuals, leading equipment manufacturers, and trade associations, should be included.

10. These Plant Requirements Reports should be prepared as prototypes, along lines discussed elsewhere in this report. However, in many instances, it is likely that the host country will not immediately translate and adapt such reports, since the need for information on any one subject is probably quite small. Therefore, the Plant Requirements Report should be presented in such a form that it can be easily adapted internally by a local engineer--e.g., where there are columns of figures in U. S. dollars, a blank column should be provided for local currency instead. A note that someone should check local requirements should be prominently placed, and perhaps space should be left for the local distributor of the report to indicate in the same box where additional personal contact may be arranged.

11. Scored cardboard punch-out sheets and templates of equipment appropriate to each type of plant might be prepared for insertion into the pamphlets (with extra copies available for separate use). Done in uniform scale to show the floor space the equipment requires, they would help a prospective user plan his factory layout and give some tangible reality to his thinking. The team studied the use of three-dimensional cutouts, but concluded that the recommended card is cheaper and simpler and serves almost as well, since height requirements are usually not too serious a problem and can be indicated on each punch-out where height is a factor to take into account. The cardboard sheets would have additional use in plant layout courses, in materials handling courses, and in a general effort to develop visual comprehension.

#### "How to Start a New Factory or Shop"

This is a pictorial pamphlet identified as a "Plant Requirements Primer" and designed to "outline steps that should be followed in starting a new factory or shop. Its purpose is to show how ideas for a new business should be collected and presented to obtain the greatest cooperation from lending agencies, other businessmen, and from (the host-country) government." (The quotation is from the foreword of the pamphlet.)

In terms of the need, this pamphlet was most enthusiastically received. It covers a subject which is of prime importance to every USOM Industry Officer. There is no doubt of the usefulness of the pamphlet even as it exists--but there are shortcomings in it, and a revised version could be considerably more useful.

The following criticisms are based on statements made to the SRI team overseas:

1. The material is badly organized and further confused by disproportionate space allotments and sizes of headings, making it difficult for a novice in the subject to follow and to see the relative importance of the various elements. The net effect can well be to discourage him by the complexity of the undertaking.

2. The wording in certain parts is hardly at the "primer" level. (Incidentally, the unflattering term "primer" should not be used on any materials for the underdeveloped areas.)

3. Instead of using eleven pages to show a few possible industries, when the point could be as well made in two pages, perhaps a chapter could be included to explain and detail simply the various types of enterprise which might be considered: consumer goods, capital goods, construction, service industries (including maintenance), parts and subcontract manufacture, supplies, and transportation. This would have the added value of helping a would-be entrepreneur understand where his own activity might fit into the total economic picture.

4. The figures used throughout are misleading and sometimes frightening. A working capital figure of \$123,500 for a plant to manufacture building hardware (page 7) would seem incredible in Aligarh, India, where a thriving lock industry exists almost on a cottage-production basis.

5. The importance of management must be stressed, and the reader must be told not to start in business unless he is prepared to observe the basic principles--quality control (at least meeting a marketable standard), production control (at least meeting deadlines and promises), and cost accounting (at least setting a proper price), etc. While some of the management principles are reflected in the present pamphlet, they are hardly in a form which can be grasped firmly by the novice.

6. Particularly, the material on marketing should be simplified, to make clear to the reader the elementary points which he must keep in mind. The considerations of style, price, quantity, and quality from the standpoint of market demands should have more emphasis.

7. The case study is too cluttered with extraneous touches, with not enough emphasis on major points, to be fully effective.

8. There should be a section on pitfalls to avoid.

#### Factory Performance Reports

This series is designed to present operational profiles of U. S. plants against which industries in other countries can evaluate their own operations, isolate areas of good or poor performance, and then improve those areas which require betterment.

There are several reasons why this particular series is of little direct value in the underdeveloped areas, especially among smaller plants:

1. There is such a disparity of fundamental operating conditions that there is no real basis of comparison.
2. The series assumes labor-saving is of key importance; in underdeveloped areas, labor-saving is far less important than materials-saving.
3. Management is inadequate in many instances to make the comparisons even if it wanted to.

In isolated cases, the material can be of use; if the series continues to be made available for the European area, it should be shown in the ITID Catalog for use wherever helpful.

#### Process Comparisons

There is a real need in the underdeveloped areas for realistic and workable comparisons of available processes and techniques, so that a new plant may use the best one, or an existing plant may improve in the right direction. In practice this would mean that if Process A for firing bricks is in use in Country 1, Process B is used in Country 2, and Process C is used in Country 3, there should be a way to tell someone in Country 4 whether the A, B, or C process would be best for him under his own conditions--or whether perhaps a Process D would have to be adopted. The Factory Performance Reports (see above) do not take this approach.

Ideally, there should be an international research institute with resources enough to gather details on all existing processes and test them to determine the best practices under varying conditions. As it stands, institutes in some countries are attempting to do this for themselves. The ITID Pool, however, would provide a relatively simple way for collecting descriptions of the various existing processes, together with data covering their productivity under the conditions in which they are used. If these data were then put together for the benefit of all concerned with developing improved processes, it would be a substantial contribution.

In the Table of Industrial Technical Information Series in Section VII, therefore, provision has been made for a series of "Process Comparisons" manuals. It is possible to produce these one by one through the ITID Pool, on some established order of priority. It might also be possible to produce them as a major project, as the first and full-time function of the Pool, until the basic processes were covered. While this would delay the general utilization of the Pool as contemplated in this report, it would represent an ICA contribution of the first magnitude to the underdeveloped areas.

Typical among processes which might be so treated are: paper making, especially from waste products; food processing; treating of hides and skins; manufacture of adhesives; ceramics; spinning and weaving.

#### Books, Periodicals, and Libraries

The Technical Aids program has recognized, increasingly, the importance of books and private periodicals in the dissemination of industrial technical information, and has at least three distinct approaches to the problem of making more books and periodicals available in the underdeveloped areas:

1. Building collections through the U. S. Book Exchange.
2. Providing technical libraries as ICA projects.
3. Providing bibliographical information so that books and periodicals may be requisitioned by the field, or purchased by host-country officials and by private citizens.

Specific recommendations for ITID's participation in a program of stimulating the private flow of books and periodicals as a part of the communication complex were presented earlier. In this section, the emphasis is upon media and services which ITID could itself provide.

The use of books and libraries is considerably more limited in the underdeveloped areas than in the United States. Reading is not an established habit, the use of reference materials is even less known, and libraries not only are few but are difficult to use. There is no assurance that people read books or use libraries simply because they are given them, but it is certainly true that they cannot use them if they do not have them. It is necessary, therefore, both to provide the materials and to stimulate their use.

While the USIS has been of great help with the equivalent of the U. S. "public library," there remains a particular need for technical libraries. Government ministries, research institutes, and schools do not have even rudimentary collections, in some cases. Indonesia's technical institutes' libraries are understood to be up to date only to 1942--and these cover the basic fields of ceramics, textiles, construction, metal-working, etc. In the entire country, the SRI team was told, there are not adequate basic libraries in mineralogy, transport, electricity, coastal shipping, irrigation, and rural electrification--to mention specific fields in which development is under way or being urgently planned. ECAFE headquarters at Bangkok, designed to serve technological needs as well as economic, has a library in which 90 percent of its titles are strictly economics.

An additional and complicating factor is that in an underdeveloped area the needs are so broad and the information required so specific that the technical information library must be quite comprehensive to be of use.

The TAB has a two-year plan for establishing or adding to 300 libraries at a total cost of \$200,000. Individual Missions have adopted library projects (USOM/Iran, for instance, has furnished some \$5,000 worth of technical handbooks for technicians and libraries in the Ministry of Mining, to match libraries already installed there by the Germans). In a few countries USOMs provide subscriptions to technical and trade journals. The U. S. Book Exchange program is promoted by TAB, albeit not vigorously.

The SRI team recommends that book, periodical, and library programs be greatly expanded, along the following lines:

1. Industrial technical libraries should be standard items for procurement. ITID should work with competent librarians and technicians to establish such libraries at three levels, based on the numbers of books--perhaps a 500-book library, a 1,000-book library, and a 3,000-book library--and covering industrial technology and business in general. To

simplify procedures, ICA/W should undertake one worldwide industrial technical library project, stipulating under what conditions a library might be requisitioned by a USOM for government ministries, institutes, technical schools, universities, public libraries, trade associations, USIS libraries, USOM Industry Division offices, etc. In practice, the mechanical details might be handled by ITID, which would automatically honor the requisition signed by a Mission Director obligating Mission funds. ITID would be responsible also for keeping the book list up to date.

This industrial library program might, at ITID's initiative, or through the recommended Coordinator for Communication Programs, be expanded into an ICA-wide project to include also libraries for agricultural offices, public health activities, public administration, etc.

2. Serious consideration should be given to designating certain libraries in underdeveloped areas as depository libraries--perhaps the national libraries, university and technical school libraries, government ministries--and not only provide the basic library collection as described above, but arrange automatic distribution to them of pertinent new U. S. titles (especially including U. S. government publications).

3. Specialized supplementary libraries should be developed for major industrial fields of particular interest to certain underdeveloped areas--ceramics, leather, metal-working, etc. These libraries should also be standard items, to be requisitioned by a general classification title rather than by specific book titles. ITID would be responsible for working with experts to determine the list of books, and to keep it up to date. The actual procurement should be a matter of obtaining a contract with a private book distributor, perhaps through bids, to obtain the books, package them and ship them, for an agreed total price. (The lists of books for these libraries would also serve as the basis for bibliographies, discussed below.)

4. Special libraries should be developed for extension workers of various kinds. For instance, in view of the fundamental and increasing importance of village workers in community development programs, a small library of pocket-sized books on industrial subjects--very simply written and easily translatable--might be extremely useful. Preferably, of course, this would tie in with a general library such village workers should have, but ITID could well take the initiative to introduce the subject. Extension workers serving small industry need a highly portable but practical reference library to cover the variety of technical problems which will confront them daily. While this service might be limited to bibliographies for local selection, full libraries cheaply available on a mass basis might be fully warranted, even in English.

5. A service should be offered to provide a specially built library for any particular need, e.g., plywood manufacture, processing of volcanic ash, etc. These libraries might be developed with the help of the U. S. industry or government agency involved. As an example, the Atomic Energy Commission has a library "kit" which can be made available for institutions planning nuclear reactors.

Except under special circumstances, libraries should not be shipped to a USOM for processing. Books sent in bulk to USOM India for placement of ICA-shield stickers and for dividing into separate libraries involved considerable Mission Industry Division administrative time, when the matter could have been handled as cheaply by making it part of the shipping specifications for the U. S. contractor. This is a specific example of the backstopping service which ITID should provide, as suggested in the list of basic operating principles.

Library titles should be selected for their ability to: (a) meet the present local needs for existing industry; (b) meet the local needs for other present uses of present natural resources; (c) anticipate needs for future developments in present production (e.g., a rice-growing country will be interested in rice by-products some day) and for other development programs; (d) encompass all the related factors that enable, support, and result from the industrial process--e.g., management, the communication complex, marketing, public services; and (e) draw upon not only U. S. sources but all useful sources.

Full consideration should be given to including a photostat machine or comparable device with the library; it not only augments the library service but actually preserves the library because its use reduces the loss of books and the tearing out of pages (a considerable problem in many countries today). In hot and humid climates, the feasibility of air conditioning equipment should also be considered; a library which might otherwise be destroyed by climatic conditions within four or five years would thus be preserved indefinitely, at a considerable savings.

"Little Libraries." It is recommended that ITID develop a packet of cheap pocket-sized reprints (or new titles written especially for the purpose) covering industry, science, management, general U. S. technological principles--a basic collection of all the subjects the average entrepreneur or industrial planner in the underdeveloped country should be told about. The packet would include such simple reference works as an English dictionary, a glossary of technical terms, and a commercial atlas, and would cover the fundamental manufacturing fields, e.g., ceramics, textiles, etc., and such subjects as maintenance, safety, and the

management skills. Among the titles might well be books or pamphlets developed by ITID or private sources for specific purposes. The number of books in this packet would have to be determined by availability of titles which may cover more than one subject adequately and by other professional factors, as well as by budget. It might run from 30 to 50 books, professionally selected. The book publishing industry probably would be pleased to cooperate in such a project.

This "little library," a counterpart to the present USIA "Little Libraries," might be distributed in cooperation with USIS, or its issuance might be left strictly up to the USOM Industry Officer or the ITIO. It would go to existing libraries, high schools, universities, chambers of commerce, government ministries, trade associations, and individuals--especially to overseas "links" in the company "Letter-Link" project described earlier. Like the USIA "Little Libraries," it would be purchasable by private individuals or firms in the U. S. for complimentary presentation to particular recipients overseas.

These library packets would be expendable--and one of their advantages would be the lesson of expendability. "Public libraries" in the underdeveloped areas are too often in locked stacks, the books are filed in numerical order as received, there are no index cards, and librarians are personally responsible for lost books; it is an understatement to say that circulation is discouraged.

U. S. Book Exchange. The SRI team found little knowledge of the opportunities offered through the U. S. Book Exchange, despite the TAB descriptive pamphlet. As the ITIOs are appointed, and as the house organ is established, it will be possible to promote this service by reports on how certain Missions are taking advantage of it.\*

Cooperation with USIS Libraries. Many--but not all--USIS libraries in the underdeveloped areas have technical sections covering industrial information, and in many instances the reference librarian is drawing upon the library's own technical section to answer a wide assortment of industrial questions. The SRI team explored with both USIS and USOM officials the implication of these USIS services, and believes that whatever overlap there may be is all to the good; as a matter of fact, there

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\* In Asmara, the Industry Officer found a resourceful way to meet the U. S. Book Exchange requirement that at least a token shipment of local books be provided in "exchange" for the titles shipped from Washington. He traded to the Book Exchange some copies of Mussolini's biography, in Italian, left over from the colonial days.

should be efforts by both sides to increase the activity of the other, rather than to merge into one.

There are advantages, even from ICA's viewpoint, in having USIS perform a technical information function. For many reasons, people will go to libraries rather than government offices: they fear getting involved with the government; they fear being laughed at for a naive request; they fear loss of face for admitting they do not know all they need to know; the library is easy to find and use, whereas offices are often barred and even more often unpublicized; they find the library more personal in the sense of friendly service and yet more impersonal in the sense of not caring why the information is sought. Much of this stems from a "fix" of the mind in the underdeveloped areas: libraries give information, but governments rule and cause trouble. USIS libraries, even though they are clearly recognized as U. S. government functions, nevertheless achieve the feeling of being a public library rather than a government office; they are therefore a medium by which industrial technical information can reach people who would otherwise shut themselves off from it by staying away from government information channels. Furthermore, many who do not otherwise know where to seek information are attracted by the usual sign on USIS libraries: "UNITED STATES INFORMATION SERVICE."

If the USOM provides its own technical information services to the USIS library, therefore, it can significantly increase its contacts. Furthermore, these USIS contacts can lead to direct contacts between a potential user of the technical aids and the USOM, because a librarian can advise the patron that the USOM can help further, and the patron will often accept that advice. The ITIO, then, can utilize the USIS library in his dissemination program, and help the USIS reference librarian with the technical inquiries received.

ITID should consider helping the USIS library with the stocking of its technical section. Many USIS Public Affairs Officers felt they had budgets adequate to build their technical collections as necessary, and if they did not now have a large collection on the subject, it only reflected the present level of interest in the matter and would grow as the interest grows. Other PAOs felt that if USIS were to be considered an active participant in the technical information program, ICA might well share the costs of the technical section of the library--particularly when the USIS country mission might require concentrating on a few opinion leaders instead of scattering the effort on the general public. Most PAOs firmly believed that a good technical section in the library, however achieved, would benefit the library by increasing its traffic and contacting perhaps a different but important group of people for USIS's own program, and would help provide better library service. A few USIS libraries, however, have dropped technical information sections as a deliberate policy, to concentrate on "cultural" subjects in line with a fundamental

USIS objective of convincing the people that the U. S. A. is not simply a technological, materialistic country. Such action is usually taken only when adequate technical library facilities exist elsewhere in the area.

It is significant that not one USIS reference librarian contacted was aware that ICA provides a technical inquiry service, although some reference departments in USIS libraries answer several industrial technical questions daily--and often have to go beyond their own collections for the answer; it is further significant that they then turn to USIA/W, which provides the answers. In every instance, the librarian was obviously pleased to know of the USOM service, and the SRI team in many cases helped the librarians and USOM Industry Divisions establish contact for referral of technical questions to the USOM.

One danger was pointed out by several officials within USOM: if industrial technical information is distributed too promiscuously it can lead to actions without proper professional assistance--a "do-it-yourself" program begun without adequate knowledge and without properly adapting the general principles of a book to the specifics of the immediate problem. The SRI team believes this is an important danger. The solution, however, is not to restrain the dissemination of information, because that is exactly the opposite of the whole communication-complex process which is fundamental to technological development. The solution is to educate potential users to the importance of seeking skilled assistance. This can be done by stressing it in the materials themselves, upon which the user might otherwise solely rely. It can be done also by USIS librarians, in a cooperative and personal way, telling users or borrowers of technical materials that skilled assistance is available, through the USOM, productivity center, or whatever other facility might be set up.

Many of the users of the USIS libraries are students, but inasmuch as students are the leaders and technicians and businessmen of "tomorrow" (or even "today" in some underdeveloped areas) there is an even greater advantage to reaching them early with technical information.

The SRI team therefore makes the following recommendations:

1. ITID should take the initiative to discuss with USIA/W the various ways in which USIS can and should disseminate industrial technical information.
2. Insofar as USIA cannot budget technical collections in its libraries overseas, but agrees to their usefulness in particular libraries, ICA should undertake to provide basic libraries, as suggested above, including technical, scientific, and trade journals. At the very least it

should request the opportunity to advise USIS libraries on what industrial and scientific technical information should be included in the USIS collections.

3. ITID should take concrete steps to insure that USIS libraries and offices have a supply of technical aids materials, as may be useful, including ITID catalogs.

4. Particularly, contacts should be established upon USOM Industry Division initiative (at the suggestion of ITID) to insure that technical questions directed to USIS libraries should be referred to USOM Industry Divisions as warranted.

5. As will be noted below in the discussion of bibliographies, there should be cooperation between USOMs and USIS libraries to dovetail USIS collections with bibliographies furnished by ICA.

In all of these recommendations, as in the entire report, it must be kept in mind that the Industrial Technical Information Division (ITID) serves but one area of technical information, and that such other TIDs as agriculture, public health, education, etc., might well operate in parallel fashion, coordinated by the proposed Coordinator of Communication Programs.

Book Presentations. USIS uses the technique of book and periodical presentations to advantage. If there is presently some legal question as to whether ICA can present copies of commercial publications to private citizens or even to governments, some solution like USIA's should be possible. Mission personnel should be able to present single copies of books and pamphlets, as well as periodical subscriptions, when warranted--with flexibility enough in the procurement rules to allow taking advantage of an immediate opportunity, and without the time-consuming red tape involved in making a specific project of each such individual activity. ITID should take the initiative to achieve this, on behalf of the USOMs.

ITID should also attempt to coordinate with USIA on book presentation programs, inasmuch as a technical book presentation may often serve basic USIA objectives fully even while advancing an ICA program. Specifically, USIS should include ITID publications as presentation items, when useful. While this might be a full-fledged program (one PAO envisioned distribution and maintenance of 100 ITID catalogs), it might at the other end be as simple as a USIS library's stocking a few copies of particular pamphlets, with the librarian giving them to patrons when she believed it useful.

ITID Reprint Service. From time to time, the TAB reprints materials from other sources which appear to be of special importance. In a sense, of course, many other services of the Branch are also "reprints"--the Technical Digest, the supervisory training manuals, and various reports.

The SRI team believes it would be useful to develop a "Reprint Service" on a larger scale to take advantage of existing and current materials produced privately which might be useful in the underdeveloped areas. This would include addresses by leaders in various fields, newspaper and magazine articles, and other materials which contain not only industrial technical information but motivational ideas and examples as well. While it should in no sense be used politically, it could amount to a way by which ICA could get across its basic viewpoint without "editorializing" (i.e., propagandizing) through materials which are staff-written.

The Reprint Service would allow a fast and flexible way to get new kinds of material to USOMs and host countries. Every effort should be made to secure permission for further reprinting in host-country languages, and where such permission has been obtained, it should be clearly noted on the reprint itself.

In the case of articles in professional and technical journals, the Reprint Service would probably be buying copies of reprints furnished by the journals themselves, as scholars now buy reprints of their own articles published in such journals. This could amount to a subsidy to certain professional journals to help them publish articles of importance to the underdeveloped areas, and ITID should explore the implications of this possibility with appropriate editors and learned societies, both at home and abroad. (There are both advantages and disadvantages to such a subsidy, from the professional point of view.)

Journals. In addition to the development of special professional trade journals for the underdeveloped areas, as recommended above, ITID can be of specific service in utilizing periodicals as media for the dissemination of technical information. These possibilities are suggested:

1. ITID should work closely with commercial publishers of periodicals to arrange ways of increasing their circulation in the underdeveloped areas. A one-year free trial subscription plan has already been described and there may be other subscription arrangements which the publisher can offer. Special emphasis should be put on making available the Informational Media Guarantee plan for securing foreign exchange.

2. ITID, as part of its service to the staff, should make arrangements to supply ICA industrial technicians with professional publications and trade journals to keep them current.
3. ITID should stimulate the distribution of U. S. periodical indexes such as the Industrial Arts Index, to spur subscriptions to periodicals; as people use indexes increasingly, they will require proportionately more publications referred to in such indexes.
4. ITID should advise USIA on periodicals most useful in the industrial programs in the underdeveloped areas, or recommendations to USIS libraries.

#### Bibliographies and Book Reviews

One direct and important way to stimulate the use of books and periodicals is to prepare bibliographies--recommended lists of printed materials on given subjects. Not only do the people of the underdeveloped areas not know how to determine which books and periodicals might best serve their needs, but many of them are quite unaware that any extensive literature in the field exists even in the United States.

The most important consideration in developing bibliographies for underdeveloped areas is the ready availability of titles recommended; this is more important than selecting the "best" titles because selecting a book which cannot be obtained serves no useful purpose and only frustrates the reader. The compiler should also take into account whether the difficulty of the language and difficulty of obtaining the book will be worth it to the reader (e.g., an expensive book containing one paragraph on an esoteric side issue is not worth including in standard subject lists). Alternative choices should be provided, and the point made clear that any one of the five books listed will do, rather than all five. With these points in mind, the following bibliographical services would be of substantial service:

1. Bibliographies should be included at the back of all possible publications--Plant Requirements Reports, management series, Process Comparisons, even the very simple pamphlets.
2. Bibliographies should be prepared on specific subjects (e.g., ceramics, food canning, paper making, personnel practices, public relations) to present to any interested person. ITID could prepare a comprehensive set of such lists, with professional library assistance as

well as the advice of specialists in each field, in one loose-leaf manual, which would be brought up to date annually. In the Mission or productivity center, etc., the ITID could prepare mimeographed sheets of any subjects for which there might be enough demand to warrant, and would have the manual available to type off copies of particular lists on special request. The USIS librarian would have a copy of the manual for reference purposes. It is suggested that a worthwhile mutual arrangement would be for the ITID and the USIS librarian to check the lists together, so that when a mimeographed list was prepared by the ITID he could indicate with an asterisk which of the titles were available in the USIS library; the librarian, in turn, would undertake to get such books as were not already in the collection and which appeared to be useful additions in view of the bibliographical recommendation which the USOM would be handing out.

3. The above bibliographies should include pertinent professional and trade journals, but there is need also for a pamphlet listing American trade journals with realistic descriptive paragraphs covering their contents. In addition to showing prices and procedures for ordering, including IMG procedures where in operation, the pamphlet might well indicate which journals were available on a free trial subscription. The first page should show the reader, as suggested for the Technical Digest, which trade journals are of interest to him in his specific field.

4. ITID should prepare through its own pool or editorial staff, or through contract, a regular service of book reviews of new pertinent technical and scientific publications. This could be part of the house organ, on a restricted basis, or it could be put in the Technical Digest. It would be better if it could be a separate publication which could circulate also to USIS libraries, to local publications of all sorts (including daily newspapers), and to professional organizations and institutions, with full permission to reprint freely in any form. The book reviews would serve two purposes: (a) they would be comprehensive and factual enough in themselves to pass along technical information, and (b) they would stimulate readers to read the book for even more information.

#### U. S. Government Printing Office Publications

A great amount of technical information of use to the underdeveloped areas is produced by the U. S. Government Printing Office. If potential readers overseas could know about the available subjects and could be given a simple way to purchase them the result would be an increased dissemination of technical information at no cost (and perhaps a profit) to the U. S. government.

It may, therefore, be fully warranted to establish a monthly catalog designed especially for potential readers in underdeveloped areas. The Superintendent of Documents might do this, with the assistance of the TIDs in ICA, or ITID might take the initiative; USIA would also have a stake. In addition to the catalog, or by excerpting from the catalog, specific items might be publicized through the Technical Digest or other journals, by press releases, and other ways—perhaps including paid advertising. The catalog would include ITID materials, Small Business Administration publications, and all other materials which ITID distributes free through channels. Specifically, it should include material from U. S. Government Research Reports.

This would have the effect of broadening distribution at no cost to ICA for individuals who wished copies of their own, and would enhance the value to the recipient of a free copy when presented.

Methods of facilitating purchase of the publications are more difficult to recommend. IMG could perhaps be amended to allow the GPO to participate. Private bookstores might be allowed a commission, as they are with UN materials, and serve as middlemen for the GPO. USIS libraries might stock at least certain items. Productivity centers and technical institutes might undertake the function of overseas representative of the GPO. An ITID conference with the Superintendent of Documents, to make clear the important service which could be rendered and to indicate the potentiality of sales, perhaps would yield tangible solutions to the problem.

#### Private Catalogs

There is a general agreement that American commercial catalogs (Sears, Roebuck and Montgomery Ward mail order catalogs are always mentioned specifically) are very helpful in the underdeveloped areas, for a variety of purposes. USIS now has the Sears catalogs, donated by the company, in its libraries; they should be in many technical libraries as well because they serve entrepreneurs to check styles, designs, prices, etc., and to gain new product ideas for local production. The special catalogs on tools and tool maintenance are particularly useful. There is such an interest in these catalogs that ITID might take steps to organize a "drive" by some organization to collect used but still serviceable catalogs for shipment overseas; the companies might find some way of stimulating this by sending a notice along with new editions of catalogs suggesting that the old ones be sent to the address of the collecting organization.

These are by no means the only catalogs which are useful or desired, however. Sweet's Service, as has been mentioned, is generally in USIS libraries. Other catalogs might be provided through the Promotional Materials Services, recommended above.

From the U. S. point of view, of course, these catalogs serve the dual purpose of spreading technical information in themselves and stimulating possible sales by the issuer of the catalog. In some countries, dollar exchange is becoming easier to secure for purchases in the U. S.

### Technical Dictionaries and Glossaries

As has been indicated, the language barrier is not quite as great on technical subjects as on cultural, because English is more widely used as the international technical language. However, there do exist serious gaps, and nationalistic programs are in some instances widening those gaps by developing technical terminologies within their own "new" national languages.

There are at least two possible alternatives ITID could pursue to help make technical and scientific writings more easily understandable by readers in the underdeveloped areas:

1. It could assist in one or more of the variety of projects now centering around Unesco to develop an international technical dictionary, or even an international technical language.
2. It might undertake, as an ICA project under a contract, a glossary of technical and scientific terms which, together with its by-product and supporting projects, could provide a highly useful service.

Substantially, the glossary (recommended title: ICA Standard Technical Glossary) would consist of a list of words in American technical usage, with definitions as simply written as possible and perhaps illustrated. In any given country, or for any given language, ICA would work locally with an appropriate group to establish equivalent words in the desired language. The resultant two-way glossary would be published.

There would be an important by-product: each of the local equivalents, keyed to the American technical term, would be put on punched cards in a central office, presumably in the U. S., so that they might be printed out in any kind of classification breakdown desired. For the purpose, the

other major languages of Europe would also be assembled in the same way. Thus it would be possible to help translate a Norwegian professional article into Bahasa Indonesia by printing up both Norwegian and Bahasa glossaries on the specific subject required, using the American term as the standard for matching up the words.

The listing would also have use, of course, for scholars of language and for the establishment of the international technical language, as such a project moves forward.

### Symbolic Languages

While words are normally considered to be "language," they are, of course, far from the only language employed by the human race. There are many others, some of which are listed below. The use of these languages has its own international problems, because the languages are not standardized; but conversely, insofar as they can be standardized and used more freely, they simplify the problems of understanding through word languages. For instance, if a set of blueprint symbols can be agreed upon internationally, there is less need for fluent understanding of equivalent words among languages for "door," "electrical outlet," etc.

Some of the subjects indicated below are on the periphery or outside the immediate interests of ITID. Nevertheless, ITID could well take the initiative to find (and to have developed, where none exists) pertinent collections of arbitrary signs, signals, and abbreviations, and to stimulate interest in their coordinated use. This could be a substantial contribution to international industrial technical understanding and the transfer of know-how. Among possible subjects are:

- Architectural drawing symbols
- Engineering drawing symbols
- Weights and measures
- Highway signs
- Communication codes (flags, telegraph)
- Graphs and charts
- Weather symbols and meteorological codes
- Mathematical signs and symbols
- Electrical symbols
- Chemical terms and symbols
- Time signals
- Aircraft signs and symbols
- Military signs and symbols

## B. Services to the Mass Media

Possible ICA contributions to the development of the mass media (press, radio, television, books, etc.) have been detailed in prior sections of this report, particularly in terms of developing the communication complex.

It cannot be overstressed that ITID would have a direct responsibility to stimulate ITIOs and others in every way possible to work toward an improved communication complex. There are, however, specific media and services which ITID could produce for use of the mass media, working in cooperation with USIA, which has primary responsibility for contacts with the mass media overseas. Among these ITID media and services are:

1. Series of articles on basic economic, technological, and scientific subjects, written in popular and simple style for readers of newspapers. Through the services of ITID, these articles could be translated and adapted to local conditions, and offered to newspapers as a service which would be of reader interest and would help the host-country's development program. Comparable services could be provided for radio, and perhaps TV when warranted.

2. Prototype materials should be designed with the possibility in mind that the contents might be adaptable to newspaper or magazine treatment. ITID should make recommendations to ITIOs when it sees potential articles or series.

3. Publications should be invited to check with the ITIOs for artwork needs, particularly for the reproduction of any artwork in ITID materials.

4. If enough interest developed, a mat service might be available through ITID to provide periodicals with mats (i.e., the molds from which printable casts are made in lead) for reproduction of artwork used in their articles.

5. Where there is no national-circulation newspaper or magazine, ITID might help create a useful substitute. An existing example is "Land and People," published in Iran as a cooperative ICA-USIA project. It appears bimonthly, in Farsi, and is more or less a tabloid newspaper in format. At least one copy is delivered to each village somehow, and the experience in Iran is that there is nearly always one person in the village who can and will read the paper to the other villagers. The paper contains not only USIS materials but also technical information of interest and value to the village level. Particular officers in the USOM are

under standing instructions to prepare material for the publication, and a joint editorial board controls the contents. It is suggested here that ITID and particularly the Pool, might bear in mind the usefulness of some of its materials for a purpose such as this. Specifically, the materials designed for the mass media could be furnished equally well to this type of publication.

6. An alternative approach to a tabloid newspaper, as above, is a wall newspaper, operating in much the same way. In some areas, wall papers are popular and effective.

#### C. Tape Recordings and Phonographs

The SRI team saw the tape recorder used in an imaginative way in India, to record the voice of a villager describing how his village accomplished a particular project, so that the people in the next village could hear a familiar tongue and get the idea to do the same thing. Tape recorders are used also, of course, to provide "sound-tracks" for silent films, film-strips, and optical-sound films in different languages (the optical sound being shut off through the projector).

Phonograph records, as a more permanent form of the same technique, can also be useful, where phonographs can be provided. Again in India, it was suggested that 1,000 phonographs would be useful, battery-amplified to make them as loud as possible for large groups to hear; transcriptions as well as records would be taken by bicycle to more remote villages.

ITID could provide scripts which might serve as prototypes for locally produced phonograph and tape recordings. Specifically, ITID might work out scripts for "audio-extension classes," to be put on recordings for direct use as above, or for use on the radio. These could teach elementary industrial technical information as readily as other subjects now taught by radio.

In addition, of course, ITID should backstop the ITIO in all the various ways he will be able to use tape-recordings and phonographs-- particularly if an inexpensive and simple phonograph could be devised so that every village or school could have one or more of its own.

#### D. Office of Industrial Resources House Organ

Except for "International Cooperation Digest," the ICA staff does not have a house organ. It is beyond the scope of the SRI study to discuss this particular matter in detail, but it is germane to the subject

of the report because the absence of an ICA-wide house organ makes an Office of Industrial Resources House Organ all the more necessary. Even if there should be an ICA-wide house organ developed, however, the Industry house organ would still be useful and justifiable, in view of its functions as enumerated below.

ICA does have another publication, "The Multiplier," produced by the OAVS division, primarily for Audiovisual Officers in the field. The SRI team investigated closely the value of this monthly publication to the Industry Divisions, and explored the question of whether it should be expanded to include special services required by the Industry Divisions or whether it would be better to establish a separate publication for the Industry Division functions.

While distribution of "The Multiplier" to technicians in the Industry Division (and other subject-matter divisions) is quite varied from Mission to Mission, full distribution could be achieved, of course, if it were advisable to establish "The Multiplier" as a service publication or house organ for these divisions. There is little doubt that this publication is of value to Industry Division officers and technicians when they get it--and when they read it. It is also reasonably clear that they do not read it very much; the general reason is that Industry personnel do not identify it as their own. Whether or not this ought to be the case is not too important; it is a fact which cajolery cannot correct. It could be corrected by having "The Multiplier" include enough additional materials of direct concern to the Industry Division, but this would destroy the present purpose of the publication.

It is recommended that ITID produce a house organ to serve the needs of the Office of Industrial Resources and the personnel of the Industry Divisions in the Missions overseas. (This in no way implies that "The Multiplier" should be discontinued; on the contrary, this publication should include more industrial material even if the new house organ is inaugurated, and should be sent to all Industry personnel who are interested.)

This house organ would be addressed primarily to Industry Officers, technicians, and specialists in the field, and therefore would provide a medium of communication for all the officials and desks in the Office of Industrial Resources.

The functions (and thus the contents) of the house organ would be:

1. Make all concerned realize they are part of one team.

2. Keep the field informed of ICA and especially Office of Industrial Resources policies and programs. Particularly, the publication would explain why directives were issued, and what they meant. The Industry Officer in the USOM is so busy that he cannot keep his staff properly informed about what he learns through channels; the house organ will do it for him in many ways, or at least support him in what he is reporting.
3. Stimulate the sense of urgency and of mission, which ICA must always have to work most effectively.
4. Publish findings by the Pool--new processes, equipment, etc., which the Industry Divisions can utilize.
5. Describe briefly new ICA industry projects which have significance to Industry Divisions in other countries--as ideas to be copied, as places to check for comparative experience, etc.
6. Inform the staff of personnel changes, travels of officials and consultants (for planning purposes of those who might be affected).
7. List forthcoming events (conferences, trade fairs, etc.) for planning purposes, and report findings of meetings just concluded.
8. Serve basic ICA policy, Office of Industrial Resources policy, and ITID policy by publishing articles and notes which reflect good practice, give credit for good ideas, and otherwise stimulate appropriate action.
9. Inform the staff about USIA and other agencies, in terms of how their programs affect ICA.
10. Publish book reviews for the professional use of the staff, and otherwise give professional assistance.
11. Educate the field personnel to value and use technical aids, through "how-to-do-it" articles and by reports on successful ideas worth copying, etc.\*

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\* One expert told the SRI team that technical aids are not used enough currently because the man in the field has a psychological urge to invent his own hand loom or otherwise demonstrate his creativity even though a perfectly good technique exists; if the house organ could show him how to be creative in the use of technical aids themselves, his urge might be met in a less wasteful way.

12. Promote particular technical aids to the field, with explanations as to their applicability. (In Europe, the Factory Performance Reports were not adequately used until USOMs were shown how to use them.)
13. Announce new prototypes and other ITID materials such as films and filmstrips, and suggest possible uses.
14. List questions and problems needing answers, and invite replies from the personnel in the field. This could be on behalf of the Pool, or a particular desk in the Office of Industrial Resources, or a USOM.
15. Sound out the field on proposed materials and services, reactions and criticisms.
16. Publish announcements of materials scheduled for reprinting, and ask whether the Missions have any changes to suggest or if they have unusual need for the material which will affect the normal press run.
17. Encourage action consistent with ITID policies and techniques, e.g., involve people in projects, using media interchangeably.
18. Cultivate the concept that ITID is a "can-do" service organization by inviting requests and criticisms, by relaying "success stories" of service, etc.
19. Pass on accounts of how ITIOs around the world are using technical aids and finding ways of using the host-country mass media--both to give a "pat on the back" and to stimulate other ITIOs.
20. Alert ITIOs of coming special demands for materials, so they may be prepared. (If a specialist is coming into the area to give unusual attention to materials handling, for instance, the ITIO should have notice, so the materials will be on hand when requested, not some months later after interest has cooled and an opportunity has been lost.)
21. Advertise and explain special projects in which ITID is involved, e.g., the "Letter-Link," so that ITIOs can take advantage of them.
22. Announce technical aid materials which may be available from other sources, particularly through the Sales Promotional Materials Service, discussed in Part I, if that recommendation is followed.
23. Provide technical aids promotional materials and how-to-do-it articles useful for republication in host-country house organs and other media.

24. Provide a basis for helping a host-country government to develop house organs of its own.

25. Ask for new names for ITID mailing lists, and otherwise keep information current.

26. Stimulate interest in audiovisual aids and techniques in general, and report on new equipment and professional literature. There should be a specific department in the house organ for this subject, edited by the director of OAVS if at all possible. There can be much more use made of audiovisual aids if industry officers can be told that there are simple ways of getting film strips produced inexpensively, or if case studies can be presented with exact details on how something was done (where they got the paper and ink, how they made this, what each part cost, how long it took to train a man, etc.).

To make the house organ most effective, the following guiding principles are recommended:

1. The publication should be sent by airmail or air pouch. The information in it is perishable, and the publication will perform its basic functions only if it can make a timely impact upon the reader. Specifically, also, ITID will be asking information upon which to plan new programs; the delay in time caused by slow shipment of the house organ would cost much more than the air postage. Further, a reader who can furnish the answer may well decide it is not important enough to bother with if the matter had so little priority as to come by surface mail.

2. The publication should be slanted also to be useful to the reader, else why will he read it when he has so much else competing for his time? There is always a temptation to make such a publication more directly useful to the home office; it becomes a procedural manual, a means of exhorting the field to "do this to help us," especially on such matters as filling out forms properly. This approach is like killing the goose with the golden eggs. The home office has everything to gain from a house organ, but only as it shows the reader that he is the reason for its existence.

3. There will be a great temptation to make the house organ serve a variety of groups--host-country personnel, other offices of ICA, etc. While there is no reason they should not get copies for whatever value there may be in them, to broaden the purpose of the publication to serve their interests directly will only diffuse the contents so much as to make it difficult for the Industry Division personnel in the field to

see it as their own publication. Thus the point made in No. 2 directly above will be lost. A separate edition, with some materials dropped and others added, might be useful for secondary purpose, but it should be made clear that this is a separate edition.

4. In format and production, the house organ must be professional and attractive. Anything less will not be read and used properly, and the whole investment is lost, to say nothing of the loss of results which could otherwise be achieved. The cost of proper editing and printing is minor compared with the waste involved in "economizing" to the point where the purpose is defeated.

#### E. ITID Promotional Materials

As the proliferation of technical aids materials increases, there is an increasing need for catalogs, lists, and other descriptive materials to indicate to the field what is available. There is also a need for "promotional" materials, as the technical information program increasingly recognizes its responsibility for motivating people to use its services.

These can be separate functions, with separate kinds of supporting materials, or they can be handled together. In either case, their effectiveness is not automatic; even a catalog requires utilization of professional techniques to insure that (a) it will be referred to and (b) the user will be able to get information from it easily and accurately.

The TAB has produced both informative and promotional materials from time to time, and has recently begun a monthly listing called "Industrial Reports and Publications" which is its most comprehensive effort to keep the field informed of the variety of materials being made available. It is obvious that a good deal of thought and hard work are going into this listing, but the result falls short of its potential usefulness in several respects. Among the most important limitations of this listing are:

1. Adequate descriptions are lacking, and the titles are too often meaningless or misleading, so the user cannot know what actually is available even if he has the list.

2. Sources from which the materials may be obtained, by what procedures, and at what cost, are not adequately indicated.

3. There is no mechanism whereby the information may be kept cumulatively; i.e., to find a title, even if the general category is known, requires going through each issue of the list.

## Industrial Technical Information Catalog

There is a substantial need now for a full-fledged and efficient catalog of industrial technical aids, and the need will become more critical as the quantity and variety of aids increase. Not only Industry Officers but many other groups in host governments, international organizations, and even the private sector indicated the value of such a catalog. As has been indicated, USIS saw usefulness in it for the USIA program; one PAO would like at least 100 copies to put in key places to demonstrate the great substance of American technical assistance; the Industry Officer in one of the smaller countries would like at least 30 copies, to present one to each industry as well as to place in libraries. Most officials concerned wanted a file copy and additional copies to lend out. Industry Officers in particular saw them as good "door-openers." They would have substantial value in informing technicians in other ICA fields (e.g., agriculture, education, etc.) what the Industry Division has available. While the catalog would stimulate pertinent requests on the one hand, it would alleviate the present problem of either distributing copies of technical aids too promiscuously just to be sure to hit the right person or being too niggardly and missing an opportunity to provide service.

For the variety of purposes which the catalog would serve, two different editions are recommended. One would be loose-leaf, kept current weekly or monthly with insert sheets; copies of this edition would go only to field service personnel immediately concerned with ordering and utilizing technical information materials. The other edition would be bound, and published annually for presentation copies, for libraries, and for officials who should know about services in general but who do not necessarily need the very latest word. The loose-leaf edition would contain specific requisitioning instructions for materials procurable through the USOM; the bound edition would have space for an imprint indicating the office to contact for further information and for the listed materials themselves.

The contents of the catalog would include:

1. All items which ITID would have a specific interest in seeing distributed, except (a) such categories as films, which are so numerous as to require a separate catalog as a supplement, and (b) supplementary commercial materials, such as books, where listings would simply constitute bibliographies. These items would be listed under classifications set up by the overview pattern and the Table of Industrial Technical Information Series discussed in Section VII below. This classification system would simplify the organization and finding of specific items, and its use in the catalog is one of the reasons it was developed by the SRI

team. Using this system, it would be possible to prepare insert pages to keep the catalog up-to-date.

2. General services which ITID or USOMs would provide would also be included as separate descriptive sheets, semipromotional in purpose. The availability of such matters as a film service and the film catalog would be indicated in this way. Enough information would be supplied to be definitely useful, e.g., the film catalog listing would at least show subgroupings and sample descriptions, with instructions as to who has the film catalog.

3. The Industrial Technical Information Catalog would also contain listings of such materials as commercial exhibits of U. S. products, displays, and demonstrations, which ITID could arrange for USOM use upon request. Since it would be too great a task and too expensive to cover the whole range of American manufacture, the catalog would note primarily the availability of such services, and how they might be obtained. As noted later, an exhibit supplement to the general catalog might be useful.

4. General series of pamphlets and books would be included with a description covering the purpose of the series, the contents in each pamphlet, and a listing of the specific titles, with additional descriptions for such titles as may require explanation.

5. While most materials fit into series, there are certain separate items; each would be given a sheet in the loose-leaf edition.

6. Each listing in the catalog would include enough information to be genuinely helpful to a user who is not familiar with the materials. In simple and precise language, the description would cover the contents of the technical aid, its purpose, applicability, size, availability, and cost. The language used in each aid and the level of writing should be made clear, and there should be an indication of its degree of adaptability to local conditions. (Space should be left for local indication on catalog sheets as to availability of local versions.)

7. A comprehensive index should be included, and a substitute index should be provided regularly to keep current with inserted sheets in the loose-leaf edition.

The development of such a catalog would make the present "Industrial Reports and Publications" monthly listing unnecessary, unless it has an administrative use within the Office of Industrial Resources to warrant its retention.

### Promotional Materials

Two different kinds of promotional materials are required: those which will "educate" the field service to the availability and use of industrial technical aids, and those which the field service can use in turn to "educate" the ultimate consumer as to technical aids services available.

Presently, the TAB does not provide any of the latter category, or any prototypes which might be adaptable. It has, however, a series of "brochures" of the first type (to educate the field service) and some promotion intended for the ultimate consumer is included. On certain services being described, the USOM official is the field service while the host-country official is, in this case, the ultimate consumer. These distinctions are not clearly recognized, with the result that it is sometimes difficult for a reader to know whether he is reading administrative procedure not intended for him. For instance, the Technical Literature promotion booklet intends to make clear that appropriate offices may utilize the service to advantage, but TCM/India reported that this has caused the Mission trouble because it gives the impression that the public can get books free.

In view of the complexity of the problem, it is recommended that a fresh start be made on promotional materials. The catalog, as suggested above, would be the central promotional and informational item; with it in existence, certain other materials could perhaps be dropped altogether and the remaining ones could serve more specific and separate purposes.

The various services of ITID would, of course, be covered in the catalog, and with an ITIO in the Mission to stimulate use of technical aids, there would be no problem of the Industry Division's not knowing about the services. The ITIO might well need small folders to present to potential users of specific services; however, ITID could prepare these in such a way that they would not only serve his need but also be useful as prototypes adaptable to host-government needs.

ITID should also accept responsibility for developing prototypes for promotional pieces which the field service could use in promoting the use of technical information by the ultimate consumer. Posters, for instance, might be a useful medium, and a booklet of adaptable posters in miniature size would be a suitable prototype. The specific needs of this service would have to be judged from evaluation and feedback, once the ITIOs, the Pool, and the ITID editorial staff were functioning.

F. Technical Aids for the Use of the Field Service

Following are suggestions for several manuals which would provide the field service with techniques for adapting and applying ITID technical aids. Most or all of these would have to be staff written, probably by the editorial department of ITID, since that department would also have the responsibility for preparing the aids which the manuals would be discussing.

Adaptation of Prototypes

A key to the solution of a major communications problem in the underdeveloped areas--the need for localizing materials--is the prototype, as discussed earlier. The ITID editorial staff would develop special techniques for producing prototypes in such a way that they would be most easily adaptable. The field service, however, would need explicit suggestions on the possibilities for adaptation, with examples. The manual could serve as a simplified editors' and production manual, for the benefit of host-country personnel who are beginners in the communication profession. It would also include a check list of operations to perform and specific items to watch for; e.g., include a copyright notice where applicable, show date of production and source of material, etc.

Manuals for Making Technical Aids

The making of such materials as films, filmstrips, flipcharts, posters, displays, and exhibits comes to the borderline of the Audiovisual Division, and manuals describing specific processes probably should be furnished by OAVS or at least be done cooperatively with that division. There is a need, however, for such materials at the level of the subject-matter technician rather than that of the Audiovisual Officer who already understands the principles.

Conceivably, there could be a series of small manuals on such subjects as:

1. How to make simple film strips
2. How to make flipcharts
3. How to make flannelgraphs
4. How to design posters
5. How to design exhibits and displays
6. How to draw match-stick cartoons

### Promotion of Technical Information

The specific techniques of promotion as applied to the underdeveloped areas and to technical information in combination present a problem never before undertaken on the scale required by a thoroughgoing ICA technical information program. A manual, even in preliminary form, would be of great use; and if it could serve as an experiment, with accurate reaction from the field as a result, a revised edition could make a very substantial contribution to the art of science of providing technical assistance.

Preliminary drafts for such a manual might be requested from the few USOM personnel now serving in technical-information promotional programs (the team met just one such officer, in Manila), and the manual might then be developed from the know-how available in the Pool and editorial staff.

### Promotion Manuals for Specific Campaigns

In addition to the manual on promotion of technical information, there are perhaps several problem areas which warrant manuals designed to give specific suggestions and case studies for use of the field service dealing with the matter.

An example of a typical "campaign" manual is the pamphlet, "Increasing Productivity Thru Simplification, Standardization, Specialization." It is considered beyond the scope of this report to deal in detail with a single pamphlet on this level, but it may be said in general that aside from a need for better organization of material, this is a good example which could be followed in other subjects believed worth stressing, e.g., materials handling, personnel practices, and the organization of trade associations.

Perhaps the most important subject for a project manual is the development of a national industrial technical center, as discussed next.

### Manual for Starting and Operating a National Industrial Technical Center

Since many underdeveloped countries of the world are just now beginning formal programs to disseminate technical know-how, there is a substantial need for a manual on setting up and operating a center to develop informational materials, organize channels of communication, and perhaps train personnel to man the extension service involved. The TAB has

prepared a preliminary draft of such a manual under the title "Activities and Institutions of the Industrial Technical Cooperation Program."

Inasmuch as this is a preliminary draft, with comments solicited from the field, and because copies of the manual were just reaching USOMs as the SRI team was visiting team, it was not practicable to obtain evaluations in any detail. The team has these observations, however:

1. There is a real need for the manual, and the draft edition meets it substantially by providing a great amount of case information.
2. The manual will be used more if its name is more clearly indicative of its purpose. At the very least, the cover should state that it is a manual or operational guide, as distinct from a descriptive report of "activities and institutions."
3. The recommended principles, policies, and procedures in the manual should be more simply stated and more conveniently organized. The case studies are interesting and valuable, but by their very nature somewhat diffuse. The transmittal note indicates valid reasons for the present arrangement, but in terms of usefulness to the field, the establishment of tentative guide-lines--if not norms or evaluations--nevertheless deserves reconsideration. The individual user can take his own country's particular requirements into account more easily against a clear set of general principles than he can against a bewildering set of varying answers to varying conditions.
4. Particular attention should be paid to these phases of a center's possible activities: planning, research, production of materials, training, extension services, and promotion.
5. The manual should have a good index.

G. Source Materials for Field Service Use

The materials described below are to be distinguished from the actual industrial technical information which is being transmitted. These are materials which can be used by the field service to transmit that technical information more effectively.

Art-Scrap Book

The SRI team found a need in many places for the type of source materials which artists in the U. S. call "scrap"--e.g., drawings of

various animals and inanimate objects clipped from magazines, different kinds of letters and figures. In one center, the SRI team noted that it took three "artists" a day among them to draw a house fly in recognizable form for a health poster. They had never really observed such an insect, and they had no place available where they could find a picture of one. It is suggested, therefore, that a book of "scrap" be produced to cover the basic objects likely to be used in illustrating or promoting industrial technical information media.

This book can have specific uses, which should be borne in mind in preparation:

1. The drawings can be used as the basis for a variety of media from large posters and flannelgraph cut-outs to pamphlet illustrations and film-strip frames. Proportions of the drawings should be varied or variable, to allow for different requirements; if a choice is necessary, it perhaps would be more useful to keep in mind possible use for film-strips, since the proportion would be useful also in printed materials by and large.

2. Details should be simple enough, and outlines broad enough, to allow direct copying, photographing, or use with a pantograph.

3. The English word for each drawing should be included.

#### Poster Source Book

There is need for a prototype collection of posters (shown in miniature, perhaps four to a 6 x 9 inch page) on such subjects as safety, personnel relations, maintenance, general maxims, suggestions systems, literacy, health, and where to get technical information. These would furnish ideas to local poster designers. The book should include a simple discussion of principles of poster design and use, and production techniques (especially the simple, inexpensive, and locally available method for printing posters described in the Unesco Educational Studies and Documents Series, No. III, Jun. 1953, "How to Print Posters.")

The collections of posters themselves could also be available as a pamphlet series, or at least considered as prototypes for local adaptation.

#### Developing the Communication Arts

While in one sense the subject of communication techniques and equipment belongs with the other subjects which follow in the section entitled

"Subjects," there is another sense in which it must be considered among the special tools of the field service. These are the tools whereby the field service does its job, the channels and media which they devise to insure the best flow of technical information. There is need, therefore, for special manuals to treat these subjects in a directly helpful way for the field service. The manual mentioned just above, on the production of posters, is an example. Among the others which should be developed are the following:

Printing. The field service deals with printing production problems at every turn. It is helpful for the field staff itself to know the basic processes, some of the principles of typography and layout, the results which can and cannot be expected under certain conditions and with certain materials (e.g., good photographs cannot be reproduced well by letterpress on some paper stocks), and the terminology. (Unesco Educational Studies and Documents Series, No. XI, December 1954, "Some Methods of Printing and Reproduction," is a useful pamphlet in this connection.) In addition, the manual should suggest ways in which printing should be cultivated as part of the communication complex. It is a basic communication process, and there should be much more general knowledge about it than now exists.

Photography. What has been written above about printing applies generally to photography. The SRI team frequently was in areas in which photography was frowned upon and even banned, as some sort of black magic or at least a degrading influence. The positive values of photography as a means of communication, especially useful in situations in which language barriers exist, should spur direct attention to developing the art and expanding facilities for its use.

Films. The motion picture is, of course, a tremendously important communications medium, especially in language-barrier situations, if proper techniques can be used to conquer the film's own language problem. Because of the problem of local adaptation, a much higher proportion of films used in the underdeveloped areas will have to be made specifically for the local audience. These may be professional films or amateur films, and the industry technician as well as the host-country representative should have as much basic information as he can about films and film making.

Radio. In some countries, the radio is the only national form of communication, although lack of receivers creates great gaps even in this medium. Educational radio in the United States never quite lived up to the great promise it held, but that was perhaps due to the competition of other media for the listener's time. In underdeveloped areas, where the competition is not as great, the radio as a device for educating and disseminating technical information can be of first importance--if the proper techniques can be developed. A manual is needed to meet this problem. (All of the above will be even more true of television, when it becomes more generally available.)

Cartoons. The value of the cartoon in the underdeveloped areas varies from area to area, depending upon such factors as prior exposure to medium, the traditional kinds of art forms of the culture, etc. There are also groups in the United States which believe the cartoon is a threat to literary appreciation, if not worse; and the excesses of the comic book habit are widely deplored.

Nevertheless, the SRI team believes there is enough potential in stimulating the use of cartoons in underdeveloped areas that a careful study should be undertaken in each local area to make a final determination. Whatever the disadvantages of cartoons, these seem to be among the advantages: (a) they make it possible to convey information with less and with simpler language, (b) they have a fascination which motivates people to read them--and to learn to read further, and (c) whether in comic book or newspaper form, they are highly expendable and can be passed from hand to hand.

If it should be determined that the cartoon is a useful medium, a manual on the techniques of the cartoon and comic strip would be useful, with particular stress on techniques for the underdeveloped areas. Just as the light bulb indicates "idea" in a U. S. comic book, some set of symbols may have to be devised to serve as part of the cartoon "language."

#### H. The Technical Inquiry Service

Beyond any question, the Technical Inquiry Service is considered by the USOM Industry Officers to be the most useful technical aid provided. This service provides specific answers to specific questions, and thus is as tailored to the local situation as is possible with highly technical information, short of an expert sent to the scene for the particular purpose. (At times, an expert is warranted, and a recommendation to provide such a service is included in this report.) The number and complexity of

questions may be expected to increase greatly as the technical information program expands in the underdeveloped areas.

There are persistent criticisms of the service on two counts, however: first, despite recent improvements it is sometimes still too slow, and second, it is sometimes inadequate. These are important criticisms, insofar as they are justified. When the service is poor, some other (non-U. S.) source is used, in a way that reflects adversely upon American performance; or the whole project is dropped, even though it may be a useful one; or the man waits, and someone else moves in and beats him to the new process or whatever it might be; or he proceeds without information, in error. Inasmuch as this is the service which directly helps the aggressive, most-likely-to-succeed entrepreneur, it will pay dividends to serve him well.

"Too slow" is a matter of relative judgment, in a way. One or two months to get a good answer to a difficult question may be very fast indeed, if all the facts were known. However, practical considerations are often involved and must set the standard: there may be important reasons why an Industry Officer needs an answer by a certain date. The Service must somehow be set up so that the USOM may send a cable, if the urgency requires, and ask for an answer by a stated date. ICA/W must be organized to be able to respond quickly as to whether the deadline can be met, and if not, why not. If not, it ought to be a good reason, not simply "other commitments" or "lack of staff." What is involved is respect for the judgment of the Industry Officer in the field. He should not indicate a greater urgency than actually required, but his requests should be met if at all possible.

It is recommended, therefore, that an "urgent" service be built into the Technical Inquiry Service, and that all concerned be informed. It would be proper to explain the problem from OTS's point of view--the delay involved in contracting certain questions, the physical and mechanical problems of contacting experts and searching file. It would be proper to make clear to Industry Officers that they should not commit ICA/W unrealistically. But it should also be provided that when the need exists and is so indicated by the Industry Officer, ICA/W and OTS will "go down the line" to get the required answer. Probably provision should be made for a "customer" to pay cable charges on urgent answers, at least in certain cases.

"Inadequate" is also a matter of relative judgment. But, again, there is a practical test. An answer which "nearly" tells someone how to set up a plant but forgets one or two points is no more useful than a leap from one side of a chasm that "nearly" reaches to the other side.

There were several instances quoted to the SRI team, demonstrating that better and faster answers were received from private sources or from other governments than from OTS on the same question sent to both places at the same time.

In any event, the SRI team saw much evidence that USOM Industry Officers as well as host-government officials and private citizens in the underdeveloped areas are writing directly to private contacts rather than going through the Technical Inquiry Service. This obviously means they think they can get better and faster answers, or at least that it is simpler than the "red tape" of going through channels. Insofar as overseas private citizens can get adequate answers from private U. S. sources, this is all to the good. But to improve the Technical Inquiry Service for such questions as cannot be handled privately, the moral would seem to be: make it simple to use, make it good, and make it fast.

Part of the question of quality of an answer depends upon the amount of time and money spent upon it. It is often difficult to know where to draw the line. It is recommended, therefore, that the Industry Officer indicate to ICA/W the approximate value of the answer in a way which will guide the responsible officer in deciding how much effort to expend on the question. The recently issued "Background Information Check List" could perhaps be revised to include a recommendation from the Industry Officer, perhaps by a code; perhaps it would be better to have an accompanying form. This indication should be a guide also to such matters as whether books or photostatic copies should be provided with the answer.

The ITIO will be able to help the Industry Officer considerably in making recommendations on these matters. The SRI team heard suggestions that such an officer (or, in his absence, the Industry Officer) should screen questions received from productivity centers or other national technical centers to try to find answers to questions locally before sending them on to ICA/W. The team believes this is highly impractical, because it could pre-empt all of the ITIO's time without much hope of saving money, since he could hardly be equipped to serve as a one-man OTS. Someone in the USOM should screen questions to see whether the inquirer is bona fide, whether the question is consistent with the total program, whether it is properly worded to get the most useful answer, and to indicate urgency and relative value. Someone, preferably an ITIO, should work with the national center in the regular course of events to make certain that the center is doing the best it can (and has the proper research facilities to do a good job). But beyond this, it is cheaper and better to forward all questions to OTS.

The "overlap" with USIS in providing local service in answering technical questions has been noted above. The ITIO, on behalf of the Technical Inquiry Service, should contact USIS and offer to be of assistance. Although it may not be ICA's responsibility or prerogative to be critical of USIS handling of technical inquiries, it is a fact that answers by reference librarians to highly technical questions may harm an ICA-sponsored technical assistance project, and steps should be taken at least to minimize the danger of misinformation from USIS library sources. (This is in no sense a reflection on the work of the USIS libraries; as this report has indicated, the SRI team has great respect for the work of these libraries. However, some questions can be beyond the level of a librarian, in a technical field, without its being apparent to the librarian. For instance, USIS libraries are often asked for the "best process" for a particular chemical operation. A reference book on a shelf may describe a process, and the librarian offers that book "for what it may be worth," as a librarian might in the U. S. But in underdeveloped areas especially, "what it may be worth" often cannot be judged by a library patron even though he may consider himself fully qualified. The patron should be referred to professional assistance. The SRI team, as reported above, found the librarians more than happy to make such referrals once they knew of ICA's service.)

However, there is a special function which USIS libraries may be able to perform for a patron so referred to the USOM. Often he has come to the library because he does not want to go to a government office. If the USOM technician can confer with the patron on library premises, it may be a very highly appreciated courtesy.

#### Private Contacts and the Technical Inquiry Service

The SRI team is convinced that there is a quid pro quo for the United States in providing often-expensive answers to technical inquiries. This is the private business contact which such a question often develops. Usually a questioner is starting a new plant or expanding an old one; he is in the market for equipment. He may also be in the market for supplies, possibly even for a licensing arrangement with a U. S. firm. There would thus seem to be every reason why many U. S. firms would be willing to provide a service to the overseas questioner. However, the SRI team got the definite impression in its orientation in Washington at the start of its project trip that TAB and OTS feel from past experience that much of American business does not feel this way, and therefore must be approached carefully and as little as possible on technical inquiries.

Because of the important volume of business at stake for U. S. private firms, this report recommends that TAB re-examine its whole approach to private business. If it is then found that business is generally unfriendly to the Technical Inquiry Service, ICA should miss no opportunity for explaining its whole program to private firms, to get their best cooperation, and perhaps even get them to take over. Promotional pieces, personal contacts, form letters requesting information should all be restudied, to this end. The organized contacts recommended earlier in this report for developing private channels should be developed and utilized fully.

At the very least, it should be possible to arrange with the National Association of Manufacturers or other appropriate organizations to endorse the Technical Inquiry Service in such a way that to every letter which OTS send to private enterprise for information, endorsement could be attached to help explain the real importance of the service requested. If the American businessman understood this, the SRI team is confident he would do a better job of answering, to the advantage of the quality of the Service.

Also, there should be a closer connection between the Technical Inquiry Service and the Contact Clearinghouse. Bonus contacts to American business through the Technical Inquiry Service will have favorable repercussions.

#### Technical Inquiry Service for Tangibles

Part of the Service, whether it would be handled internally by OTS or by some other contractor, should be the answering of technical questions involving tangibles--ores, samples, products, etc. There are deep implications here, and the SRI team is not competent to judge the total effect. Nevertheless, inquiries on tangibles are important, and at least one facet has already been so recognized by TAB. The Product Analysis Service is in reality a part of the Technical Inquiry Service, broadly conceived. It is suggested that this might be more generally known and more widely used if it were more clearly tied into the question-and-answer operation. It is recommended that this entire area be given further exploration as a service of possible value to the underdeveloped areas.

#### Technical Inquiry Service for Reference Materials

One of the services of the Technical Inquiry Service, already established, is to provide 3 x 5 index cards for generally useful previous

answers to technical inquiries. Reprints of these answers are available upon request. Some 90 sets of approximately 800 cards have been distributed from OTS through TAB to various Missions and national centers.

It was pointed out by one Industry Officer that it made no difference to him whether an answer were already available or not; if he needed the information he would request it. As a result, he did not need the cards. However, as this report has indicated, for most Industry Officers, the "red tape" of requesting an answer through channels is very often enough to stop the question; but, if it is a simple matter of requesting a reprint by number, the request will be made. The cards, therefore, make useful information much more generally available.

Occasionally Technical Inquiry Service answers include photocopies of materials or even books, when the importance of the question warrants.

It is recommended that these services be dramatized by stressing that "reference materials" may be requested as part of the Technical Inquiry Service. This connection may be for external purposes only, with various functions handled separately once the requests reach the TAB, e.g., OTS may or may not be the logical contractor to provide photocopies for all requests. The SRI team has no recommendation on this point. It does believe, however, that an expanded Technical Inquiry Service, to include microfilming of certain out-of-print materials on occasion, and other copying methods, would be useful. It could also include blueprints of plans, designs, and working drawings. The bibliographical services suggested earlier might even be placed in this service.

One specific and somewhat dramatic suggestion was made to the team in this regard. Instead of providing libraries overseas with back copies of professional and trade journals, why not insure they had adequate indexes and abstracts (specifically the Industrial Arts Index) and encourage them to request photocopies of the original article? They could pay a service charge which would still be less to them than the cost of maintaining back files; they could thus have all of the world's current technical literature at their disposal; and on a routine basis, they could probably have their answer as quickly as needed. The SRI team recognizes that there is at least one complicating factor--the copyrights which may limit copying of trade journals--but the service charge perhaps could cover fair compensation to the publisher. It believes, in any case, that the subject is well worth full exploration and possible testing.

The 3 x 5 card index to Technical Inquiry Service answers could also be expanded into a major service. There could well be a bound index of all the pertinent answers among the 17,000 answers now accumulated by OTS through its ten years of both domestic and foreign service. This bound

index could be expanded beyond the answers to technical inquiries to include other pertinent data which OTS (or ITID generally) could make available. This would include articles in the Technical Digest or the Journals as recommended, and in the house organ; it could also include books furnished as parts of standard technical libraries. In some ways it would amount as well to an index of the contents of many of the items in the recommended ITID Catalog. While this would be a considerable undertaking, it might simplify the task overseas of finding technical information. The SRI team did not have this suggestion until too late to explore with USOMs, but believes it is worth further study. In any event, the 3 x 5 cards should be continued; with a printed index, they would serve as a current index until the next printed issue became available.

It should be a conscious policy, on all of the reference materials where copyrights do not apply, and specifically on OTS inquiry answers, that the ITIO and host-country officials consider ways of making these materials available in local languages, as necessary.

#### "Division of Labor" for Technical Inquiries

If the Pool is established in ITID as recommended in this report, copies of all Technical Inquiries should be sent to the Pool as a routine matter. This would serve as a kind of feedback which would be useful to the Pool's own functions; more immediately important, however, any Pool staff member who could contribute to an answer would immediately contact OTS. This by-product service of the Pool, however, should not interfere in any way with the speedy processing of the question through OTS.

In one other particular, ITID might be involved in a decision affecting the short-term consultants' pool, recommended above. If the USOM Industry Officer recommends that a consultant be sent, it would be ITID's responsibility to consult with OTS and with the officials handling the consultants' pool, to determine whether the matter will be handled by consultant or by OTS as a technical inquiry.

There is some question in the minds of USOM Industry Officers whether the OTS service is available to themselves. The SRI team believes it is fair to ask OTS to handle this type of inquiry; in fact, it should be encouraged. In this way, the Industry Officer will be able to get information needed to buttress a suggestion he may make to a local firm on such a matter as undertaking a new process. Since both TAB and OTS seem agreed on the value of such a service, all that is needed is proper notice to USOMs. This, again, is the kind of service the house organ could provide, on a continuing basis.

## I. Films

The motion picture film has a very large potential for use in the underdeveloped areas, as has been noted in this report, and a good beginning has been made. It is estimated by ICA that the total spent in the European recovery program for films was \$1,000,000 of U. S. funds plus \$5,000,000 in counterpart (i.e., local) funds. Including film programs for school use, and considering the longer period of development ahead, the total money to be spent for films in the underdeveloped areas may well run several times that amount. It is important, therefore, for ITID to pay particular attention to its film services, as an integral part of this broad development.

There would be substantial differences between the film program in Europe and one oriented to the underdeveloped areas. In Europe, the films could concentrate on relatively few subjects, under more or less homogeneous conditions, in a few countries, and with a cultural context not too different from the American. Therefore, preprint material of U. S. films could be made available for producing films in quantity; distribution could be systematically controlled, and utilization could be checked. In the underdeveloped areas, a much wider range of subjects is needed, and at different levels; there are fewer users for any one subject, under heterogeneous conditions, and with cultures quite different from the American. Basic film lists and preprint materials of U. S. films do not seem to be as practical a solution as in Europe. There are, furthermore, physical problems such as lack of equipment, electricity, and mobile equipment. (Except to take them into account as a condition, these physical problems are not considered part of this report, since they are under the cognizance of OAVS.)

One major solution already being attempted on the underdeveloped areas' special problems is to produce films locally, country by country (although some regional film production is possible for the Arab States and perhaps Latin America). The solution is admirable in many respects: it meets much better than U. S. films the inherent communication difficulties described in Part I of this report; it helps develop the communication complex in a variety of ways; it stimulates interest in an audiovisual program as such; and as the operation is taken over by local people it means a savings in the ICA program.

However, there is a substantial place for U. S. technical films in underdeveloped areas. For one thing, "local production" is more easily said than accomplished, particularly in enough volume to support an active training or informational program. Furthermore, if, for any given subject, there is an American film which is not made inapplicable by

including cultural features strange to another country, it would be wasteful duplication for such other country to make a similar film. (It would be wasteful, too, for a country to make a film when a neighboring country has just made one which meets enough of the communications problems to be generally useful.)

It is in the industrial technical fields that films are least likely to be made inapplicable because of any cultural content. A film on a social or political subject is so closely related to the cultural complex that it may have almost no applicability from one culture to another; a film showing the proper way to wind an armature can almost certainly be used intact, especially if the purpose of showing the film is to get the viewer to do exactly the same thing.

Even in films which are primarily motivational, there is a chance that a film can be too local, so that it does not inspire or teach anything new. And to meet the whole "local" problem head-on, it is possible to suggest that continued showing of U. S. films might result in an educated audience able to absorb the message despite the cultural differences. Certainly increasingly large audiences in underdeveloped areas come to understand and to like Hollywood films. In almost every country of the world, there are at least a few persons who are highly educated and fully able to understand U. S. films; these are also most likely to be the ones interested in highly technical films.

The real problem, therefore, is to find films which are useful to the underdeveloped areas and make it simple for these films to be obtained and used in the host countries. Each of these matters is taken up in turn below.

#### Obtaining Useful U. S. Films

The SRI team did not have the opportunity to study how well OTS is able to uncover existing films in the United States. It is understood that various film producers and sponsors forward new films to OTS for preview in the normal routine of sales promotion, such contacts having been built up over the years by OTS. Additionally, OTS watches film announcements in trade and professional publications, and asks for preview copies of likely films thus noted. Films from private commercial companies come to the attention of OTS through contacts such as trade associations and film organizations in Washington.

There is reason to believe that a concentrated campaign to find short highly technical films made by U. S. firms for their own training

requirements might uncover a great number of films quite suitable for the underdeveloped areas, and available at no cost except for copying and shipping. Requests for such films through a Private Cooperation Clearinghouse, as recommended in this report, could prove most useful; lacking such a center, ITID could contact professional and trade journals read by the various industries, and especially the journals of the film-making industry itself. They would almost certainly cooperate, once they understood fully the importance of the request.

Another potential source of films--on a large scale--is the group of more than 70 university film production units in the United States. They are now doing work for television, for public relations activities, and for audiovisual services; some of it is on a production basis, some of it is part of the classroom process. They may have pertinent existing materials. As long as they are producing new subjects anyhow, they might well be persuaded to tie in with a technical information program, to make their projects doubly valuable. In some instances, they may even be having trouble finding likely subjects for films. A liaison unit in ICA could work with these units to great mutual advantage.

#### Evaluating the Films

The problem of evaluating films in such a way that another person may decide from a written description whether the film will serve his own purposes is long-standing and far from solved. This is true even when the purposes are generally standardized, as within the U. S. school situation. When the purposes are almost infinitely varied, and changing rapidly, and when the judgment has to be made by an individual who cannot hope to have more than a partial appreciation of what those different purposes may be, the problem is perhaps beyond fully satisfactory solution.

However, even a partially successful screening is necessary and useful, and general criteria have been established. TAB now furnishes to OTS general criteria to "match as far as possible the varying existing levels of development in the economic aid program." Much of the criteria statements consist of clarification, interpretation, and perhaps expansion of specific requests from USOMs. TAB has also attempted a "film kit" of a number of different films circulated to various Missions with a request for their reaction. Comments such as this often provide guides for criteria, although the film kit program is too small and too slow to provide a major source of data.

The SRI team heard some requirements for films for underdeveloped areas stated so often, in such seemingly different parts of the world,

that they may perhaps be considered general criteria for films directed at the supervisory level and below. They are included here in brief form for their possible value:

1. Films should have inspirational and promotional value to host-country nationals.
2. They should show things within the scope of host-country people to achieve, on equipment that is available.
3. They should picture scenes not too disparate from the geography and climate where used.
4. They should not contain cultural irritants; the fewer a film has, the more useful it is.
5. They must have built-in techniques for helping the viewer understand: long "establishing" shots, very long close-ups from various angles, and a much slower pace than typical U. S. films. They can have no "tricks" such as flashbacks or montages.
6. Perhaps above all, the audience must be able to identify itself with the film and see personal advantage to be gained from doing what the film shows.

If the ITID program recommended in this report is adopted, and if the Pool and the ITIOs are functioning, there will be available a constant feedback which should greatly improve the sensitivity of the evaluation process beyond anything possible for the underdeveloped areas now.

#### Cataloging the Films

The first result of applying criteria to films is to eliminate films which are not useful to the general purpose. Next, those films which remain must be described in writing in such a way that the potential user will know whether to order a particular film for his particular purpose. Generally, these descriptions or evaluations are separate sheets in a loose-leaf film catalog.

The TAB catalog, prepared by OTS, is currently being revised with "supplements" which will in effect practically supplant the original catalog based on a full-scale evaluation in 1951 of films suitable for the European Recovery Program. In these catalog sheets, OTS does not

include evaluations or recommendations that a particular film is the best in its field, but confines remarks to the technical side of photography, sound continuity, etc. The attempt is to give the technician in the field as comprehensive a description of the film as possible, to permit him to make the final determination as to whether the film will fill his particular need.

The SRI team believes, on the basis of comments from the field, that this evaluation does not go quite far enough. A description of a film cannot rest alone on content: the details of the objects shown, or the action, the level of comprehension required, the complexity of language, the pace of the film, the relationship of all these matters to the subject of the film and the content, are integral parts of a description, especially for underdeveloped areas. While it is unfortunate that such qualitative factors cannot be set down precisely or uniformly, a reasonably successful attempt is worth the risk involved.

While all of this may seem very complex, serving only to lengthen the catalog sheets, it nevertheless faces up to the biggest single barrier hampering the full utilization of U. S. technical films. Lack of adequate descriptions discourages the ordering of films, and past experience with wrong selections based on existing descriptions adds to that discouragement. Of the 60 films the Industry Institute at Beirut bought at around \$150 each, on the basis of the ICA catalog, more than half proved unsuitable. Money lost in that proportion is a deterrent to a film-purchasing program.

A "poor" film may be poor only because it was selected at the wrong level for the intended audience, but it nevertheless adversely affects the entire audiovisual or technical aids program, and reflects on film producers. For this reason, the American film producers might be willing indeed to help support a project which would insure better catalog descriptions. It is recommended that ITID take steps to invite their cooperation. A full-scale conference might be most useful, after preliminary discussions.

It is also recommended that the TAB and/or OTS work closely with Unesco headquarters in Paris on the project to standardize film cataloging methods. While there may be reasons why ICA might not be prepared to adopt Unesco recommendations entirely, there is much to be gained from taking the Unesco techniques into consideration. They are based upon a proposal by the International Scientific Film Association and represent perhaps the best professional thinking available on the problem.

A five-point statement of criteria developed in 1946 by a conference sponsored jointly by the American Council on Education and the Film Council of American,\* offers a simplified approach to the problem and will at least indicate in tangible language the kind of evaluation to be included:

1. An objective, comprehensive, and accurate statement of the content of the material.
2. The educational objectives served: "What in general is it good for?"
3. The audience level suitable.
4. General rating—good, excellent, poor, etc.
5. An over-all critical statement to simplify reasons for general rating, including the technical qualities of the material, and the subjective judgment of the group making the criticism.

At the very least it is recommended that OTS adopt and use the code words in "Notes for the Completion of the Data Sheet," developed by the Unesco project to indicate the general approach and technique of the film, e.g., whether the film is "factual, record, documentary, informational, instructional, training, research, demonstrational, descriptive, interpretative, integrational, actuality, newsreel, cine-magazine, compilation, historical, fictional, biographical, or motivational." These terms could be defined in the front of the film catalog, as Unesco defines them, or as desired. (At least one other category, "selling" or "merchandising," might well be included.)

#### Other Catalog Details

It is understood that current supplementary sheets are including costs and release dates "unless they are unavailable." The SRI team suggests that if a cost figure is not available, the film should not be included in the catalog. Absence of prices has caused difficulty in USOMs in the past.

All of the other standard technical data should be included in the catalog. If data cannot be obtained, the film should not be listed, because it cannot be intelligently selected by the potential user.

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\* "Use of Audio-Visual Materials Toward International Understanding," in American Council on Education Studies, Series 1, No. 25 (1946).

One additional kind of information should be included in catalogs, with a code of some sort that can be attached to the film itself, to show rights, clearances, and availability. These terms are defined in some detail in the Unesco "Notes for the Completion of the Data Sheet," previously referred to. Information of this kind is becoming increasingly important as television and commercial theaters become factors, and as the "trade barriers to knowledge" change. If there are too many restrictions on a film's use, there is no point in purchasing it; this is information the potential buyer should have, therefore. It is information which should accompany a film, once purchased, to insure that legal limitations are complied with.

While the breaking down of film titles into meaningful classifications is a difficult task, it is not simplified from the user's standpoint if the film catalogs are based on internal administrative convenience instead of on a compilation that will put all like subjects together. The present arrangement is for filing the supplementary sheets according to the organization responsible for them (i.e., OTS, Capital Film Laboratories, Loan Library, etc.). There is an advantage to having a unified listing of all available loan-library films, but even this would not seem worth the inadequacy it creates in a general list of available films by removing the presumably most-useful ones into a separate list. It is recommended, therefore, that a unified subject-matter cataloging system be devised, with the assistance of the professional organizations involved in such problems.

#### Providing the Films Themselves

Next to determining the suitability of a film from a catalog description, the biggest problem of potential film users overseas is obtaining the films themselves. Delays of months and even more than a year were reported to the SRI team on films procured through ICA channels. There are difficulties with customs officials in some countries when films come through private channels instead. Whether justified or not, many Industry Officers and Audiovisual Officers felt they were handicapped by red tape within TAB or at least within ICA. Many of them mentioned particularly restrictions on air pouch use which held up major programs.

Obviously, anything which TAB can do to simplify procurement procedures will be an important help to a vital program. As recommended earlier in this program, ITID as a new organization might be relieved of the procurement administrative responsibilities, although ITID might well set up a service desk to help expedite procurement of needed films. Perhaps centralized allotments could somehow be devised, or at least a

Mission budget item for films could be so allocated that film purchases could be drawn against it in small amounts without tedious requisitioning detail. The use of films represents a communication opportunity that is often fleeting, and the procurement and accounting safeguards which are now in effect may not be worth the cost in lost opportunities and waste of personnel.

#### Film Loan Library

One important contribution which TAB is making toward a solution of both parts of the film procurement problem is the Film Loan Library. This makes it possible for films needed urgently to be available, at least to meet the immediate requirement. It also provides a Mission with a preview of a film, so that catalog descriptions need not be relied upon in those instances. Ideally, if the Loan Library could be combined with a film previewing service, much of the problem would be solved. At the very least, however, it is recommended that the Loan Library be expanded to the fullest appropriate level of usefulness.

#### Cooperation with USIS

USIS has a functioning film program in every country in which it operates, to serve its own program objectives. Sometimes it serves also a technical information function on behalf of ICA. In a few instances, this is by cooperative agreement; sometimes it is by default in the absence of an ICA film program.

It was clear to the SRI team that cooperative film programs with USIS are not only feasible but desirable. ICA films should be available through USIS, as well as through more direct technical-information channels. One PAO even suggested that USIS and ICA issue a joint catalog, either at Washington level or for a particular host country.

The services of an ITIO will make cooperation much easier to achieve, and it could pay important benefits to both the ICA and USIS programs.

#### International Film Pool

In all of the mushrooming activity in the underdeveloped areas to achieve local production of films, one of the most tantalizing possibilities is a pool or service of some kind to make films of one country

available to the others. But if finding cataloging and distributing films from the United States is difficult, it may be imagined what could develop from a worldwide effort.

Nevertheless, there may be a reasonably simple procedure possible. For instance, if all countries, including European, adopted a uniform catalog sheet--perhaps the Unesco form--and if a central clearinghouse obtained these sheets from each country and sent them in unified form to all countries, there would be the basis for such a pool. Each country could stipulate on its catalog sheet exactly how prints might be borrowed or purchased, and on a minimum basis, this could be handled between the two countries without a central agency to expedite. While this might logically be a Unesco project, it could conceivably be handled by ICA instead. At the very least, ITID would appear to have enough at stake in such a development that it might take the initiative on behalf of ICA to explore ICA's role in such an operation. It should be noted that this is by no means a matter of starting from scratch; much thought and effort already have gone into finding a solution along these lines.

#### Technical Considerations

As the SRI team made its field study, one issue being debated by Audiovisual Officers was whether magnetic striping should be adopted. This is perhaps a technical matter within the province of OAVS rather than TAB, but it is being noted here because of the considerable contribution it can make in overcoming language barriers. Since the magnetic striping makes it possible to add a local-language sound track to a film as easily as it can be put on a tape recording, the fact that a film is originally in English is in itself no longer a serious handicap.

Against the many considerations in its favor (flexibility, versatility, economy) the only objections heard were that it requires projector equipment (which is not expensive) and that the sound can be wiped out accidentally (but can be restored). One additional criticism was made, but is hardly valid; it was said the magnetic sound track can be sabotaged by someone substituting defamatory or otherwise-harmful ideas in the local language version, thus misleading the unknowing audience. However, the criticism loses weight when it is realized that the same thing can be done with optical sound, if one is so minded, by shutting off the optical sound and running a defamatory tape recording through the speaker at time of projection.

It is recommended, therefore, that ITID pursue a policy of supporting magnetic striping and techniques in all ways possible. Apparently,

adding the magnetic stripe delays delivery of films in some cases. When this is a factor, the requisitioner should be notified and given his choice of optical sound or the delay. In any case, it should not be a policy factor by which ITID would decide against magnetic striping in toto.

One further technical consideration must be mentioned briefly. As pointed out earlier in this report, the process of recording motion pictures on magnetic tape is near the stage of practical, economical application, being already installed in some commercial television operations. While it cannot be predicted how soon the economical level of usage will come, it is almost a certainty in the long run. This will, of course, affect the purchasing of projectors as well as of film and film-making equipment, and ITID as well as OAVS should keep in touch with developments because of the great implications to the present capital investment as well as to future potentialities, when it will be virtually as simple to make "films" on tape as it now is to make a sound tape recording.

#### Film Loops

Starting with the findings of a research project for the Navy Special Devices Center at Port Washington, Long Island, N. Y., that daylight projection of film loops proved as effective as a live instructor's demonstration (of tumbling skills),\* the SRI team attempted to determine the value of such a device in the underdeveloped areas of the world.

The film loop is a short (one to three-minute) film which runs over and over, continuously. It was not possible to conduct meaningful quantitative research in view of the nature of the travel involved and the time element, but by discussion with education and audiovisual authorities, and by extension of the known facts, it seems reasonable to conclude that the use of film loops is a practical way of providing on-the-spot film demonstrations for many manual skills.

What this means is that in areas where instructors are few and there are simple skills to be taught, there is a mechanical means which can be used effectively. Thus, specific operations or techniques in carpentry, masonry, window glazing, painting, plastering, soldering, sharpening tools, ceramics, printing, auto mechanics--virtually the whole roster of individual semiskilled and skilled motions which can be done within two or three minutes' time--can be taught by a film operator who need not be skilled himself in the technique involved. Demonstration vans can bring techniques along with equipment to more remote areas. Special applications can speed classroom teaching.

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\* Report SCD 269-7-25, "Daylight Projection of Film Loops."

The film loop requires special, although not expensive, equipment. The SRI team has seen a plastic converter for an ordinary projector, produced by Encyclopedia Britannica Films; there may be others. Daylight projection equipment is probably necessary.

This constitutes a new medium for conveying technical skills, and ITID would seem justified in experimenting to see how useful it really could be. It will be noted that in the Table of Industrial Technical Information Series, below, space is provided for possible series of film loops in various crafts and arts. Such films could be made specifically for that purpose, but it is likely that judicious "clipping" from existing footage would yield adequate short sequences showing technical skills.

#### Film Strips and Slides

The film strip is potentially a very useful medium for conveying technical information in the underdeveloped areas, but it has not yet been developed very far. There was evidence on the trip, however, that this situation is beginning to change, and that film strips will be used much more widely.

It is possible to make a film strip very inexpensively--virtually for the cost of the length of film involved. A series of drawings in panels the size and shape of film-strip frames, and done on acetate or even tracing paper, is laid over the face of the unexposed film in a darkroom situation. The original drawing serves as a negative when the film is exposed, and the filmstrip is complete upon development of the film. (The SRI team first saw this at the Arab States Fundamental Education Center at Sirs el Layyan, Egypt, but it is understood that the process was also being used in USOM/Turkey as early as 1953.)

Film strips can also be made in more conventional ways, and, of course, a series of colored slides is relatively inexpensive with a 35-mm camera.

With these possibilities for local production, it is possible to question whether film strips produced in the U. S. are needed at all. The answer is yes, insofar as good, broadly applicable technical subjects can be made available. What is needed, again, is a catalog, offering pertinent information. Fortunately, however, it is not as serious a matter with film strips as with films, because first, descriptions can be more explicit; the variables are fewer to discuss. Second, even if parts of the film strip are unsuitable, the rest is salvageable, and with a tape recording to accompany a film strip presentation, almost any

film strip can probably be adapted to local conditions by what the speaker tells the audience. Third, even if the film strip is a loss, the cost is not great. Fourth, it is possible to prepare a folder which presents the frames of the film strip with accompanying tape-recorded text. The purchaser thus has a nearly exact preview of the film strip.

While this is an important use of the folder, there is a more important use. A film strip's message is retained longer if there is some sort of folder or study guide which the audience can carry away. If the folder has all the pictures, and not only the English text but the dubbed-in local language text (in a column of space left beside the pictures for the purpose), the audience has what amounts to a simple textbook on the subject.

ITID should, therefore, continue present efforts to increase its film strip catalog; it should, in addition, develop prototype pamphlets or folders as described above, making the prototypes serviceable for purchasing purposes, for use with English-speaking audiences, and for local language audiences with the surprinting of local texts.

#### Three-Dimensional Miniature Film-Cards

For cases in which a film strip would be useful for showing to an individual or a small group, there is a relatively new medium which deserves attention. It has special virtues which make it ideal for underdeveloped areas.

The three-dimensional miniature film-card viewer is the modern plastic successor to the old stereoscope, with the advantages of being lighter and less bulky. One small movable card holds an entire set of film frames, and allows full color plus the three-dimensional effect. The viewer and film-cards are quite inexpensive, enough so as to be considered expendable. The cards are lightweight, small, easily filed. New cards can be made locally, at little cost or trouble. The viewer requires no light source beyond what the user is already seeing by.

Against the film-card, the film strip has its disadvantages. It is relatively bulky, and it operates better by electricity, although the Coleman lamp projector has been a boon. It is hardly worth setting up for one person. It does not have the three-dimensional effect.

It is recommended, therefore, that ITID take steps to develop a film-card program, comparable to the film strip offerings, especially in those fields which have these requirements:

1. An extension worker is likely to be contacting individuals or small groups.
2. Three-dimensional pictures are an advantage, as in machinery and plant layouts, or almost any object which is an unfamiliar shape to the viewer. For "plant tours" the film-card would be reasonably close to the real thing.
3. Glamor and sales appeal are useful, where color and depth would make the subject more dynamic, dramatic, or appealing.

These are important possibilities for accompanying these film-cards with booklets or other presentations. For instance, a film-card available for a Plant Requirements Report could visualize a plant layout for a reader-viewer in a way impossible either through the booklet alone or by a verbal explanation from an industry technician.

Space is included in the Table of Industrial Technical Informational Series for a possible variety of film-card series.

#### J. Exhibits, Displays, and Demonstrations--The Tangible Media

There can be no doubt that this general type of technical aid offers almost unlimited opportunity; even more than perhaps any other type of aid, it is limited only by the money which can be allocated to it and the energy expended, because it successfully avoids most of the other barriers such as language, cultural differences, and lack of training. Something tangible which can be seen in operation can be understood, or at least understood more readily from a simple explanation.

All of this is especially true in connection with the demonstration, because the combination of the tangible sample or model and a person is the rock-bottom "sure-fire" form of communicating through a language barrier in an underdeveloped area, or anywhere else. Some few forms of demonstration may be too symbolic and therefore too localized to profit very much from a prototype--the puppet shows of the Orient are an example of what must be almost entirely a local production. But most demonstrations can utilize some form of tangible model, and ITID can perform a service by making the tangibles available to the demonstrator.

It is recommended, therefore, that increased attention be given to developing a "tangible media" program.

There are various ways in which this can be approached, and many of them are possible in combination. ITID probably will have to experiment to find the ways it can be most helpful.

#### Catalog and Ordering Service

Because of the advanced state of audiovisual techniques in the United States, the interest in models as hobbies, and the development of exhibits and museums, there is presently available from commercial sources almost any conceivable model or mock-up of a device or piece of equipment relating to industrial activities at a reasonable, simple stage.

If ITID were to prepare a catalog of these materials (as a supplement to the general ITID catalog) with some comprehensiveness, well-illustrated, and with full purchasing details, the USOM staffs and host-country personnel could buy directly what they needed. It would, of course, be a great help if ITID could arrange a purchase plan for USOMs which would eliminate the red tape required of ordinary procurement. The suggestions offered for other comparable problems would be equally pertinent here.

Among the kinds of items which such a catalog might include are:

1. Working models of machinery, in wood and plastic--diesel and gas engines; generators, motors; dynamos.
2. Cut-aways, in wood, metal, glass, plastic, etc.
3. Oversize models for such items as the slide rule, micrometer, vernier scale and caliper.
4. Knocked-down kits for do-it-yourself instruction--radios, electric motors, ceramics, all of the hobby equipment.

#### Do-It-Yourself Plans

On a great variety of subjects, small folders or pamphlets could be prepared to show the field service how to make models--giving the dimensions, colors, etc., and describing the ways the moving parts work. These could then be made either commercially or by students, as part of their learning process. (In the Philippines, the SRI team saw a hand water-pump designed by a school teacher for his class; each student made a copy of the original, and thus had a tangible exhibit to take with him upon

graduation. The hope was that some of the students, at least, would make them for commercial use later and thus help meet a serious water problem.)

If the Pool recommendation is adopted, ITID would be able to collect information on such equipment as pumps and kilns, developed in underdeveloped countries; the Pool could then prepare the "do-it-yourself" blueprints for use in other underdeveloped countries, and thus make a realistic contribution to the improvement of techniques in those countries. This would be especially appropriate when a really basic piece of equipment is developed--a rammed-earth brick maker, a solar stove or cooker, a 4-spindle cotton spinning machine, etc.

#### A U. S. Person-to-Person Program

A special (and probably short-term) campaign could be developed through the U. S. public schools, vocational schools, and perhaps colleges and universities to design and produce such things as dioramas, actual tools, models, and exhibits, to be sent for use overseas. This would not only provide such materials in quantity, but it would have other advantages: it would help teach Americans the meaning of ICA's program; it would associate the school children (who would actually make the materials) with world affairs, to help them understand; it would lead to "pen-pal" contacts; and it should convey to the underdeveloped areas some sense of America's interest in their welfare. Care would have to be taken, of course, not to let the program backfire into a propaganda or "charity" drive.

#### Prototype Exhibits

ITID could develop a prototype demonstration van so that an extension worker could travel with it to dispersed industries, to show a carpenter, for instance, the layout and operation of a more efficient carpentry shop. Because there would have to be local adaptation to meet various standards of attainment and customary practice, the prototype should include variables. It should be arranged so a USOM could order the entire demonstration van or any parts of it in combination--again without too much red tape. There should be blueprints available for local construction of as much of the van and exhibit as possible. Such demonstration van units are now used to a small extent, and reportedly are effective. Tent units and railroad cars are also employed.

Separate exhibits would be feasible and useful for each of the basic crafts or services in which a one-man shop (or even a five-man shop) is feasible, and in which the idea or technique can be grasped in one relatively short showing. An intricate process or a special skill which requires practice to develop--like glass-blowing--probably could not be usefully demonstrated in this way.

The other technical aids media should be tied in with such exhibits. Film showings to assembled groups, for instance, might be effective. If the exhibit is to be shown to one man at a time, a film loop would be useful, or the film card viewer. Pamphlets and study guides which can be left with the audience, simple textbooks, bibliographies, even miniature libraries might be warranted under certain circumstances.

In such countries as Indonesia, the Philippines, and Greece, where there are numerous small islands to be communicated with, the possibility of a boat instead of a van should be considered. (The SRI team investigated also the ultimate in a demonstration unit--the "Showboat" of Greece and the comparable barge on the Rhine, which ended up in Holland. These vessels combined major exhibits with sleeping quarters for staff and entertainment facilities. The team believes they can serve an exceedingly important purpose, in terms of major policy; however, they are also exceedingly expensive, and the team has no way of determining whether their aid to the ICA program would be at all commensurate with their expense. If President Eisenhower's "Atoms-for-Peace Ship" is approved by Congress, however, ITID should attempt to insure that an industrial technical exhibit is included.)

#### Dioramas

At the other extreme from actual size is the diorama, which can stimulate actuality by a "peep-show" arrangement, or simply by framing a display in proportionate context. A series of dioramas can take an audience through a manufacturing plant with great realism. Flow processes are especially dramatic--oil wells, water pumps, cooling systems, air-conditioning, etc. ITID could have a series designed on contract, or perhaps with the cooperation of an industrial arts school; it could also prepare booklets to guide local schools in making their own.

#### Comparative Exhibits

With the help of the Pool, it would be possible to put together traveling exhibits (or permanent ones, in development centers) of different

ways of doing commonly accepted things, e.g., various kinds of roofing, such as tiles, thatching, corrugated iron, roofing paper, slate, shingles, etc. This would not be a matter of recommending one technique over another. The viewer could compare for himself, and determine which ideas were worth "borrowing," in view of his country's needs and native materials. Other likely subjects would be stoves and fireplaces, latrines, roadways, footwear, simple food processing, bulk grain storage, water systems, carts and wagons, fishing methods. Pamphlets with photographs of these materials, and perhaps such visual aids as films and film cards would be useful for reference.

This same sort of thing could be done on an elementary level for basic mechanical processes and devices, such as gears and pulleys, levers, pumps, cams, etc., and the next higher level for such processes as electrical circuits, water systems, combustion systems, printing, etc. These could be "junior-museum" exhibits, as known in the U. S., with pamphlets available to ITIOs to help local construction of working models; or completed models could be produced in the U. S.

#### Table-Top Models

It is understood that the Philippines Industrial Development Center plans to spend approximately ₱1,000 (\$500) to make table-top models for an industrial exhibit department; such plants as plywood, canning, and textiles would be included. This project should be watched closely, to see whether it actually stimulates entrepreneurs to undertake the most useful kinds of manufacture, from the standpoint of the country's needs.

On a somewhat simpler basis, it would be possible to "mass produce" perhaps a hundred each of "toy model" clothing plants, foundries, etc., to go one to a Mission or national center, to accompany Plant Requirements Reports and other materials which can be helped by a tangible. (Whether the cost would be worth the difference as against a film card view of such a plant in actual operation is something which might have to be tested.)

#### "Put-Together" Cardboard Models

It would be relatively inexpensive to produce booklets containing five-sided drawings of various pieces of equipment, to be cut out and pasted on wooden blocks (made locally) to give a three-dimensional model for placing on floor plans, for layout purposes and as part of a model plant.

One such pamphlet could perhaps be done with basic equipment for a variety of manufacturing and servicing processes, or one could be done for each of the various industries. The cut-outs could be done on heavier stock, so that they would not need the wooden blocks but could stand alone. In special cases, it might be worth furnishing the blocks as well, or actually providing the finished models.

The model should have indicated on it the scale size and the English name, and blank spaces for inserting the local equivalents. All pieces in a set should, of course, be to the same scale.

### Industrial Museums

It is understood that there are several industrial museums in Europe. Requiring approximately 10,000 square feet, they show primarily safety equipment donated by manufacturers for the commercial returns they receive from the display. They could be used for maintenance exhibits as well as for safety, and perhaps for other subjects. A before-and-after comparison of unlubricated axles, unpainted surfaces, etc., could teach important lessons in this way. ITID could take the initiative to work with U. S. manufacturers--of safety equipment in the one case, and of paints and lubricant etc., in the other case--to make available such exhibits for any country or major city overseas which indicated not only interest but a guarantee that it would maintain the exhibit indefinitely. USIA has asked U. S. manufacturers for an exhibit of simple machinery, and has obtained it.

It would be possible to adapt this idea to simple plants such as a shoe repair shop. In fact, by combining the permanent industrial museum idea with the traveling demonstration van for small shops, it would be perhaps quite feasible in national capitals to establish a permanent display of several rooms or booths showing a "good" plant for various small industries at the level of development of the country.

Conversely, there is no substantial reason why an industrial museum could not be portable, or at least movable under certain circumstances, so that it could be taken to areas which do not ordinarily have much communication with the central cities.

### Trade Fair Exhibits

The team found substantial support for the idea that a trade fair is a good medium for disseminating technical information. While the Department of Commerce has responsibility for U. S. trade fair activities in

general, ICA may be warranted in considering active participation for the tangible benefits its program can achieve. Not only could an ITIO help devise an informative exhibit with the help of such materials as have been listed here; he could establish contact with entrepreneurs who are seriously interested in developing new plants, and could also be the instrument by which such entrepreneurs and U. S. firms are brought together.

Because handouts are popular at fairs (and apparently almost everywhere else in underdeveloped areas), appropriate technical aids materials could be prepared locally--on the basis of prototypes prepared by ITID for such occasions.

One further specific item in connection with trade fairs is worth examination. Commercial reference libraries are developed for fairs, including directories and a variety of other useful information. ITID should take the initiative to insure that there is a proper representation of industrial technical information which it might supply, or which could be supplied locally through an ITIO. It might well also ask that the USOM Industry Division or ITIO have a voice in deciding where the reference library is ultimately placed (since ordinarily these libraries are left in the country after the fair ends).

#### Samples

In some instances, a model can give the wrong impression to an unsophisticated viewer. He may think it is the real thing, especially if it is much larger or much smaller than the actual object. (The story is often told of how a Walt Disney public health film with a large mosquito was completely misunderstood--the people could certainly sympathize with the U. S. and agree that something ought to be done about a mosquito that was as large as a man, but this of course had nothing to do with their own small mosquitoes.)

Actual samples, therefore, may be preferable to models, and should be considered where possible. In certain cases, samples might lead to licensing arrangements for manufacture.

#### Casebook of Exhibit Ideas

The possibilities suggested in this portion of the report are, of course, simply indicative of the broad variety of tangibles and techniques which might be applied. A catalog might well list the specific items which could be made available, through purchase or upon request to TID, including

such special services as helping develop an industrial museum. However, it would be useful to go beyond that point to prepare a "casebook on exhibit ideas for industry use." With the help of the Pool and ITIOs, once they began functioning, this could be a practical contribution. If made loose-leaf, it could be supplemented periodically as the field developed new techniques. The ITID house organ could, of course, call attention to this entire project, and stimulate action which would make good case material as well as do a better job of spreading technical information.

#### Exhibit Backstopping Service

As the USOMs and other field staffs begin making their own exhibits, there will be an increasing demand for special backstopping services which ITID could provide--a particular sample, a photograph, some information about the details of a process for a flow chart, etc. It should be made clear to the field that such backstopping is available, and facilities should be set up to make the service as fast as possible.

#### "Ingredient" Kits

One general technique which ITID could apply, following from the above in a sense, is to provide "kits" of the ingredients for making a particular exhibit, e.g., one on how shoes are manufactured. ITID would arrange for the necessary number of complete sets of the ingredients, such as the shoes in various states of completion; it would set up in ICA/W or at the supplier's plant one exhibit which would be photographed; then the photographs showing how the completed exhibit should look, together with necessary instructions and caption material, would be sent with a set of materials to each overseas point which indicated it could use such an exhibit. By this technique, the essential elements and the special exhibit know-how would be provided by ITID; the shipment would go in the smallest bulk possible, and the locally obtainable labor and exhibit panels would not represent too great a demand upon the personnel overseas. It would, in fact, probably avoid a duplication of materials and effort, since most exhibits probably would profit from the use of local materials, and certainly would involve some local effort at the very least to convert the exhibit into local languages and adapt it to take advantage of the people's cultural patterns.

### Photographic File

As noted above, the exhibit backstopping service frequently will require photographs, as will the development of new exhibits by ITID. A photographic file in ITID will be of considerable importance. If it were tied in with the work of the ITID Information Pool and the photographic file which the editorial staff certainly will require, it would both augment and be augmented by those operations.



## Section VII

### SUBJECT-MATTER NEEDS

As an important part of its overseas study, the SRI team attempted to determine the subject-matter needs of the industrial development program. It is manifestly impossible to present a list of subjects in priority order to cover the underdeveloped areas in toto; no satisfactory formula or technique for determining this has been yet devised for one country, to say nothing of the problem of assessing the relative weight to give the needs of Country A over Country B. It was possible, however, to collect the expressed needs of Industry Officers, host-country officials, and other experts and authorities, and to apply a subjective evaluation on the basis of the general findings of the team. While special or esoteric subjects were omitted, the result is a list of subjects which is still inclusive rather than exclusive, to cover the needs in a comprehensive way, so that the TAB and others concerned may at least have a check list by which to apply other data and evaluations to determine the subjects which should be given priority. It is not a recommendation that all of the following subjects be developed, much less on an urgent basis.

Because each of the subjects may be useful at different levels of development, skill, comprehension, and use, code letters have been placed after most subjects to indicate the types of information generally required for that particular subject. The code is as follows:

- B - basic mechanical principles
- E - equipment needed
- F - economic feasibility and planning
- H - simple "how-to"
- M - motivational
- P - manufacturing process involved

## Subject-Matter Check List

### 1. Basic Commodities

#### a. Wood F

- (1) Sawmills E-P
- (2) Wallboard E-P
- (3) Paper F-E-P
- (4) Plywood F-E-P
- (5) Lumber treatment and storage E-P-H
- (6) Woodworking tools, how used and maintained H
- (7) Simple carpentry operations H
- (8) Woodworking tools, mfr. of E-P

#### b. Leather F

- (1) Hides and skins, preparation of E-P-H
- (2) Shoemaking and repair E-P-H (incl. rubber shoes)

#### c. Metals

##### (1) Iron F

- (a) Foundry E-P
  - (b) Steel mfr. F-P
  - (c) Various forms: sheet, bar, wire, fabricated E-P
  - (d) Blacksmithy E-P-H
  - (e) Welding, soldering, riveting, nuts and bolts, other attachments E-P
  - (f) Plating, bluing, enameling, other protective treatment, galvanizing E-P-H
  - (g) Wire screen manufacture E-P
  - (h) Tools, how used and maintained. (Metalworking tools) H-M
  - (i) Abrasives E-P
  - (j) Pins, needles, fishhooks E-P
- (2) Copper and brass E-P-H
  - (3) Lead and tin E-P-H
  - (4) Prospecting and simple mining, smelting, and refining of metals P-H

- d. Ceramics, utilitarian only F
  - (1) Basic containers, cups, plates, bowls E-H
  - (2) Bricks and block E-P-H
  - (3) Glass E-P-H
  - (4) Tile E-P-H
  - (5) Insulators E-P
  - (6) Optical lenses E-P-H
  
- e. Textiles F
  - (1) Basic spinning and weaving of E-P-H
    - (a) Cotton
    - (b) Wool
    - (c) Linen
    - (d) Other fibers
    - (e) Synthetics
  - (2) Manufacture of clothing E-P-H
  - (3) Manufacture of rope and twine E-P-H
  - (4) Manufacture of fishnets E-P-H
  
- f. Foods and by-products F
  - (1) Basic methods of preservation E-P-B
  - (2) Refrigeration E-P
  - (3) Fats and oils F-E-P-H
    - (a) Soap
    - (b) Edible oils
  - (4) Glues E-P-H
  - (5) Can mfr. E-P
  - (6) Bottle mfr. E-P
  - (7) Baking E-P-H
  
- g. Machinery, etc.
  - (1) Basic manual of levers, gears, pulleys, cams B
  - (2) Pumps and hydraulics P
  - (3) Locks E-P
  - (4) Engines of all kinds B
  - (5) Windmills P-H
  - (6) Sewing machines F-E-P-H

- (7) Storage batteries and dry cells E-P
- (8) Food mills E-P
- (9) Oil presses E-P
- (10) Clocks B
- (11) Balances, scales and measures E-P

h. Use of waste products and by-products E-F-P

## 2. Basic Industries

a. Construction F

- (1) Basic building materials P-H-E
- (2) Roofing H-E-P
- (3) Glazing H and glass E-P (see ceramics)
- (4) Electric circuitry H and parts E-P
- (5) Carpentry H
- (6) Plumbing and latrines H and equipment E-P
- (7) Painting (incl. brushes) P-H-E
- (8) Nails, screws, other fasteners P-H-E
- (9) Heating, stoves, fireplaces, solar, etc. P-H-E
- (10) Locks and hardware P-H-E
- (11) Maintenance and preservation of buildings H-M
- (12) Basic construction tools, use and maintenance H
- (13) Soil and sewer pipe E-P-H
- (14) Tile H

b. Communication (in the broad sense) F

(1) Transport F-E-P-H

- (a) Cart and wagon construction
- (b) Boat construction
- (c) Piers and docks construction
- (d) Road construction
- (e) Airstrip construction
- (f) Bicycle manufacture
- (g) Auto mechanics course B  
Operation, principles, maintenance, repair.

(2) Reproductive and graphic arts, including printing, photography, and motion pictures F-E-P-H

(3) Editing and publishing F-P

(4) Radio manufacture and broadcast F-E-P

- (5) Audiovisual materials and techniques H
  - (6) Advertising F-P
  - (7) Field trips H
  - (8) Industrial extension services H-M
  - (9) Technical Information Centers H
  - (10) Cooperatives, Chambers of Commerce, Trade Associations F-H  
(value of, and how to organize and operate)
  - (11) Manufacture of simple writing materials (pencils, black-boards, cheap paper, etc.)
  - (12) Reference materials
  - (13) Technical symbols (e.g., graphs, codes, measures)
  - (14) Motivational techniques
- c. Maintenance and repair
- (1) Rust, corrosion, rot, wear, friction, etc., and how to prevent them by paint, wax, lubrication, etc. M-H
  - (2) Simple structural repairs H
  - (3) How to set up and operate a repair shop E-F
- d. Public and personal health
- (1) Manufacture of water jars and filters H
  - (2) Manufacture of latrines H
  - (3) Manufacture of sewage systems H
  - (4) Manufacture of window and door screens E-H
  - (5) Manufacture of umbrellas H
  - (6) Simple refrigeration methods H
  - (7) Water wells H
  - (8) Good lighting and other working conditions H
- e. Agriculture
- (1) Agricultural tools, mfr. of, maintenance and uses of H-M
- f. Power
- (1) Methods of power generation, simplest to nuclear F-E
- g. Chemicals F
- (1) Fertilizer P-E
  - (2) Acetic acid E-P
  - (3) Ether E-P
  - (4) Lime E-P

- (5) Caustic soda E-P
- (6) Dyestuffs E-P
- (7) Inks E-P
- (8) Insecticides and fungicides E-P
- (9) Plastics E-P

3. Basic Economic Concepts

a. "Western Attitudes that Produce Results"

- (1) The free enterprise system
- (2) Interdependence vs self-sufficiency
- (3) Progress: its value and how to make it
- (4) Receptivity and imagination; self-appraisal; seeking outside help
- (5) Risk bearing
- (6) Competition
- (7) Experimentation
- (8) Productivity
- (9) The value of work
- (10) The boss gets his hands dirty
- (11) What's good for the community is good for business
- (12) The value of the human being
- (13) Safety
- (14) Human relations
- (15) Teamwork
- (16) Fair play
- (17) Employer-employee loyalty
- (18) Motivating the employee
- (19) Pride of workmanship
- (20) Quality
- (21) Mechanization (quantity vs unit-production)
- (22) Efficiency
- (23) Accountability
- (24) Delegation of authority and responsibility; division of labor; subcontracting
- (25) Conservation
- (26) Planning
- (27) Smooth communications (include order-giving, order-taking)

b. Technological economics

- (1) Capitalism
- (2) Production and distribution

- (3) The creation of wealth: the service concept
- (4) Supply and demand
- (5) Savings and credit
- (6) Value of management
- (7) Long-range planning
- (8) Research
- (9) Financing
- (10) Organizations
- (11) Tax structures
- (12) Scientific approach to problem solving
- (13) Advertising
- (14) Why underdeveloped areas are not catching up

4. Management Principles

a. Production

- (1) Production control
- (2) Standardization and simplification
- (3) Mechanization
- (4) Job analysis
- (5) Good shop practice
- (6) Design and development
- (7) Materials handling
- (8) Quality control
- (9) Plant layout

b. Personnel

- (1) Organization
- (2) Wage incentives
- (3) Suggestion systems
- (4) Merit rating
- (5) Labor-management relations
- (6) Working conditions
- (7) Vocational guidance
- (8) Personnel selection

c. Administration

- (1) Report preparation
- (2) Filing
- (3) Good communications
- (4) Legal matters

d. Financial

- (1) Budgeting
- (2) Cost accounting
- (3) General accounting
- (4) Credit
- (5) Financing

e. General management

- (1) Warehousing and stock control
- (2) Diversification
- (3) Merger
- (4) Research
- (5) Safety
- (6) Public relations
- (7) Planning
- (8) Stock turnover
- (9) Starting the business
- (10) Improving the plant
- (11) Meetings

f. Marketing and sales

- (1) Packaging
- (2) Advertising
- (3) The American market and how to reach it

g. Purchasing

Subject matter must be conveyed through media, of course, and some orderly pattern of media is required so that a potential user of technical aids materials and services can more easily judge the range of materials available to him and make an effective selection among titles which might otherwise be confusing and misleading. The following table has been designed to serve that purpose.

The table may also serve another function on behalf of administrative personnel concerned, particularly if it is put onto a coordinate chart, showing the series of media (from the table) down one side, and the aforementioned "Subject-Matter Check List" across the top. By checking each coordinate point, the administrator has a key to various types of media possible for each subject, and he can determine the gaps in his program.

The listing of the media below, and the finding of gaps to be filled, does not mean that the TAB would necessarily be the organization to produce them, or that contracting by TAB would be required. In a great many instances, there are existing commercial and government materials which are adequate as they stand, and many more which require only slight revisions to make them so. Materials which the TAB presently distributes are indicated in the table by initials and numbers, representing the organization which produces the series and the number of units completed to date (e.g., "TAB, 6" indicates that TAB produces the series, of which six units or titles have already been published). Present names of series are shown, even though in some cases they duplicate each other and are otherwise confusing. The initials used are as follows:

- BLS - Bureau of Labor Statistics
- EPA - European Productivity Agency
- ITEP - International Technical Exchange Program (Europe)
- NICB - National Industrial Conference Board
- SBA - Small Business Administration
- TAB - Technical Aids Branch

The new materials suggested in this report are followed by a brief explanation of the contents or purpose of the series, unless the title makes this obvious.

Table of Industrial Technical Information Series

I. Consumer Technical Aids

A. Publications

Planning and Development Group

Industry Profiles Series (TAB, 6)

Small Industry--Cottage and Small Scale Industry Series (TAB, 6)

"Organizing for Production and Distribution" Series Handbooks or manuals, with principles and case studies, sources of help, etc., for such organizations as cooperatives, village industries, community development, productivity centers, trade associations, extension services, etc.

Planning Manuals Series

Techniques whereby planning agencies may determine priorities in technological development.

Plant Equipment and Process Group

Plant Requirements Report Series (TAB, approx. 40)

Basic Information Sources Series (SBA, 55)

Technical Aids Series (SBA, 42)

Materials Technology Series

Booklets on each of such materials as iron, leather, brick, mortar, brass, wood and oil, discussing their characteristics, properties, handling, processes, and uses, to acquaint a worker in the material with its possibilities, so that he may see new possibilities and improve his plant or techniques; primarily for small-plant owners.

Individual Skills Series

Booklets on elementary, basic operations that are required in industry, and the tools involved, e.g., carpentry, ceramics, pipe-fitting, bricklaying, soldering, painting, glazing, etc., to help one man in a factory do his job better.

**"How to Make" Series**

Booklets on how to make simple, everyday articles: bricks, whitewash, soap, fireplaces, stoves, etc.

**Process Comparisons Series**

Geared especially to underdeveloped areas, would compare processes used in different countries for such operations as making bricks, paper-making, processing foods, making stoves or latrines, so that reader might develop his own techniques by adapting suitable parts of each, or adopting one outright.

**"One-Man Shop" Series**

Basic technology and techniques in such specific occupations as shoemaking, carpentry, welding, etc.

**"Induk" Series**

Name is taken from Indonesian central production plant acting as a service unit for a cooperative, to do the difficult, costly, or too-mechanized part of a manufacturing operation, leaving other parts to separate handicraft industries. Booklets on each kind of process amenable to such methods--e.g., shoemaking, metal-working, leather, textiles, etc.

**Waste Products Utilization Series**

Booklets for each waste product found in quantity in the underdeveloped areas, with possible uses, including processes.

**Maintenance and Repair Series**

Maintenance and repair manuals on such subjects as electric motors, gasoline engines, valves, gears, electrical circuits, locks, etc., and including general introductory manual on various problems of rust, decay, overheating, etc., and what to do about them.

**Service Industries Series**

Booklets on such simple establishments as fix-it shops, garages, watch repair shops, tool-sharpeners, etc.

**Industrial Safety Series**

Simple manuals on various phases of safety.

**Productivity Group**

**Factory Performance Reports Series (BLS, 48)**

**Plant Level Studies (Europe) (ITEP)**

### **Production Techniques Series**

Manuals on various aspects of production to save time, labor, materials, e.g., materials handling, specialization, standardization, simplification, working conditions, safety, factory layout.

### **Basic Economics Group**

#### **Economics Concepts Series**

Basic principles by which the American economy operates, in simple language. Includes: capitalism, production and distribution, supply and demand, savings and credit, value of management, smooth communications, tax structures, cooperation, progress, risk-bearing, human relations, pride of workmanship, conservation, value of work, value of experimentation, etc.

### **Management Group**

Supervisory Training Manuals Series (TAB, 14)

Management Aids Services Series (SBA, 72)

Small Business Management Services Series (SBA, 17)

Summaries of Information Series (SBA, 36)

Management Pamphlets Series (NICB, 17)

Establishing and Operating a Business Series (SBA, 17)

#### **Operation Improvement Series**

Booklets on such principles and techniques as diversification, inexpensive plant improvements, pooling of transport, buying partly-fabricated parts, subcontracting, etc.

#### **Managing the Very Small Business Series**

Basic management principles and practices for the one-man or few-man shop.

### **Financial Group**

Plant Operations Reports Series (BLS, 7)

Summaries of Operating Costs Series (SBA, 27)

**Capital Requirements and Operating Ratios Series (BLS, 7)**

**Accounting Series**

Simple treatments of techniques for accounting in specific businesses and industries.

**Marketing Group**

**The American Market Series**

The American market and how to reach it: booklets for specific industries, each covering such items as American marketing channels, pricing, quality standards, style demands, dangers of fads, shipping methods, customs arrangements, payment terms, etc.

**Small Marketing Aids Series (SBA, 9)**

**Communication Group**

**General Communication Techniques Series**

Separate manuals on such subjects as editing, starting publications, writing manuals, making exhibits, holding meetings, and other fields involved in the communication complex.

**Reference Group**

**Basic Information Sources Series (SBA, 55)**

**ICA Standard Technical Glossary Series**

Using a standard list of American technical terms, the glossaries would be developed for each local language, matching against the American terms.

**U. S. Government Documents Series**

Monthly listing of publications which can be ordered from Superintendent of Documents, and which would be helpful in underdeveloped areas.

**Language of Technology Series**

Very simple booklets on such subjects as drafting, graphs, blueprints, measurements, gradations, etc., written especially to teach their use.

**Dictionaries of Symbols and Codes**

Collections of dictionaries of special codes, symbols, etc., used on architectural drawings, weather maps, mathematics, shipping, etc.

**Directory Series**

American trade directories, official directories, etc.

**Bibliography Series**

General and special lists of reference works for industry.

**Library Group**

**Industrial Library Series**

Specialized collections for specific purposes.

**"Little Library" Series**

A kit of standard titles in pocket-book form, for general background of technical information.

**Literacy Reader Series**

Prototypes on various extremely simple technical subjects, for adaptation and use in providing reading material for new literates.

**Periodicals Group**

**Technical Digest (TAB-OTS)**

**Industrial Development Trade Journals**

Monthly trade journals, one for each basic industry in the underdeveloped areas, to serve that industry.

**Management Journal**

To serve the underdeveloped areas with professional management information gathered from all parts of the world.

**List of U. S. Trade and Professional Journals**

**Reprints Group**

**Reprints of Technical Inquiry Service Replies (TAB, 17 Plus)**

These to be subdivided into series.

**Reprints of American printed materials**

Selected by TAB from periodicals, speeches, editorials, etc.

**B. Audiovisual Aids**

**Exhibit and Display Group**

"Tangibles" available or specially prepared by TAB, in the following series:

Miniature models, including table-top models

Full-scale models

Oversize models

Posters, including prototype miniatures

Movable displays

Industrial museums

Plant layout cards and templates

**Films** (generally catalogued by subject)

Special film series as may be developed to parallel the publications series (A above).

**Film Card Group** (for miniature 3-dimensional film viewers)

**Plant Tour and Field Trip Series**

Photographs of various kinds of industrial plants and service operations. Can tie in with Plant Requirements Reports series.

**Machinery Series**

Photographs of various pieces of equipment, from different angles, to give viewer some idea of size, complexity and uses of the particular device.

Special series to parallel publications series (A above), e.g., basic tools and techniques, processes and products.

General film-card cataloging by subject.

### Film Strip Group

Special film strip series as may be developed to parallel publications series.

Film strips generally catalogued by subject.

### Recordings Group

Phonograph records and discs

Transcriptions

Tape recordings

Scripts for adaptation and recording

The above to parallel the publications series

### C. Direct Channels

(Technical Inquiry Service, etc. Not detailed for purposes of this report.)

## II. Technical Aids for the Field Service

Information Bulletins on Media (TAB, 10)

Office of Industrial Resources House Organ

Monthly house organ to serve USOM Industry Divisions and Office of Industrial Resources in ICA/W.

Industrial Technical Information Catalog

Bound issue, annually, showing materials available through TAB. Loose-leaf edition, kept current.

Special Communication Techniques

Separate manuals designed for the use of the field service in advancing the technical information program, on such subjects as editing, starting publications, writing manuals, making exhibits, holding meetings, starting organizations, etc.

## **APPENDICES**



Appendix A

EXCERPT FROM WORK ASSIGNMENT NO. 3  
PURSUANT TO AGREEMENT NO. IAAC-47  
(June 29, 1955)

..1. The Contractor (Stanford Research Institute) shall furnish the necessary consulting services to organize and supervise a . . . . Survey Team for the purpose of making a comprehensive evaluation of (ICA's) industrial technical aids services program in order to determine modifications necessary to meet the requirements of the predominantly underdeveloped countries of the Near East, South Africa and Asia, and the Far East areas.

"2. The team shall visit selected European countries to collect background information for use in subsequent phases of the survey and to study utilization of technical aids services by a National Industrial Technical Center.

"3. The survey team shall visit selected countries in areas mentioned in paragraph (1), study local conditions, evaluate suitability of present technical sources of information, develop new technical media, and develop on its return to the United States materials which will become a foundation for industrial technical learning in underdeveloped areas.

"4. . . . .In order to evaluate and develop technical aids services for underdeveloped countries, the members of the team shall specifically:

- a. Evaluate the present method of communicating technical information in European industry.
- b. Develop methods of dissemination of technical information effectively in the underdeveloped areas of the Near East and Far East.
- c. Develop media, for nations embarking on their initial industrial development program, of dissemination of information on equipment, processing and other types of industrial knowledge, such as business administration.
- d. Develop special technical media for answering many technical questions for which answers are now available in developed

countries, which remain unanswered and will impede the growth of industry in the underdeveloped areas.

- e. Devise methods which will eliminate the many impediments which hinder the use of technical information.
- f. Suggest ways and means of overcoming, since there is limited education in these areas, the language barriers, as many persons in industry lack reading knowledge.

"5. The survey team shall spend a brief orientation period in Washington, D. C., to acquaint its members with the present technical aids services through discussions with representatives of (ICA), the Office of Technical Services, U. S. Department of Commerce, the Bureau of Labor Statistics, U. S. Department of Labor, and the U. S. Information Agency.

"6. The team shall devote one month to a study of the present technical aids service program and the media employed for communicating technical information in Austria and/or Italy as representative European countries with supplementary visits to France and Turkey at the discretion of the Contractor. The specialists shall interview those who have been served by the technical aids services to determine the utility and effectiveness of transfer of the information involved.

"7. Upon completion of the European portion of the survey the specialists shall proceed to countries in the Near East and Far East areas to determine the most effective means for communicating technical information to countries which are in the early stages of industrial development. The countries visited shall include Liberia or Ethiopia, Pakistan or Indonesia, and the Philippines. In the event visits cannot be arranged for some reason to these countries, alternate countries shall be arranged by written agreement with (ICA). The team shall devote approximately ten weeks in the above mentioned countries.

"8. The team shall submit informal summaries of its observations to (ICA) through the Contractor upon completion of the visit to each country. Upon the return of the survey team to the United States it shall prepare a draft report describing its findings and recommending the most effective means of disseminating technical information in the underdeveloped areas. This draft report shall be delivered to (ICA/W), within forty-five days after the team's return to the United States, and its recommendations reviewed and discussed with (ICA) staff members. Subsequent to this discussion the Contractor shall prepare samples of an assortment of media after mutual written agreement with (ICA). These

samples might include films, film strips, audiovisual demonstrations, sketches of displays and illustrated pamphlets. Acceptance of the samples and a final report by (ICA) shall constitute fulfillment of the Contractor's obligation....."

Appendix B

RESEARCH TEAM ITINERARY

October 26, 1955	Leave San Francisco, California
October 27	Chicago, Illinois
October 28-29	Toronto, Ontario
October 31-November 8	Washington, D. C.
November 9-12	New York, New York
November 14-18	Paris, France
November 19-22	Vienna, Austria
November 23	Neunkirchen, Leoben, and Judenburg, Austria
November 24-26	Vienna, Austria
November 27-December 3	Rome, Italy
December 5-6	Palermo and Mondello, Sicily
December 7	Naples, Italy
December 8-10	Rome, Italy
December 11-14	Athens, Greece
December 15	Araxova, Thebes, and Levadia, Greece
December 16	Athens, Greece
December 17-18	Istanbul, Turkey

Woodcock

December 19-26	Beirut, Lebanon
December 27-29	Tehran, Iran
December 30	Beirut, Lebanon
December 31	Cairo, Egypt

Lieberman

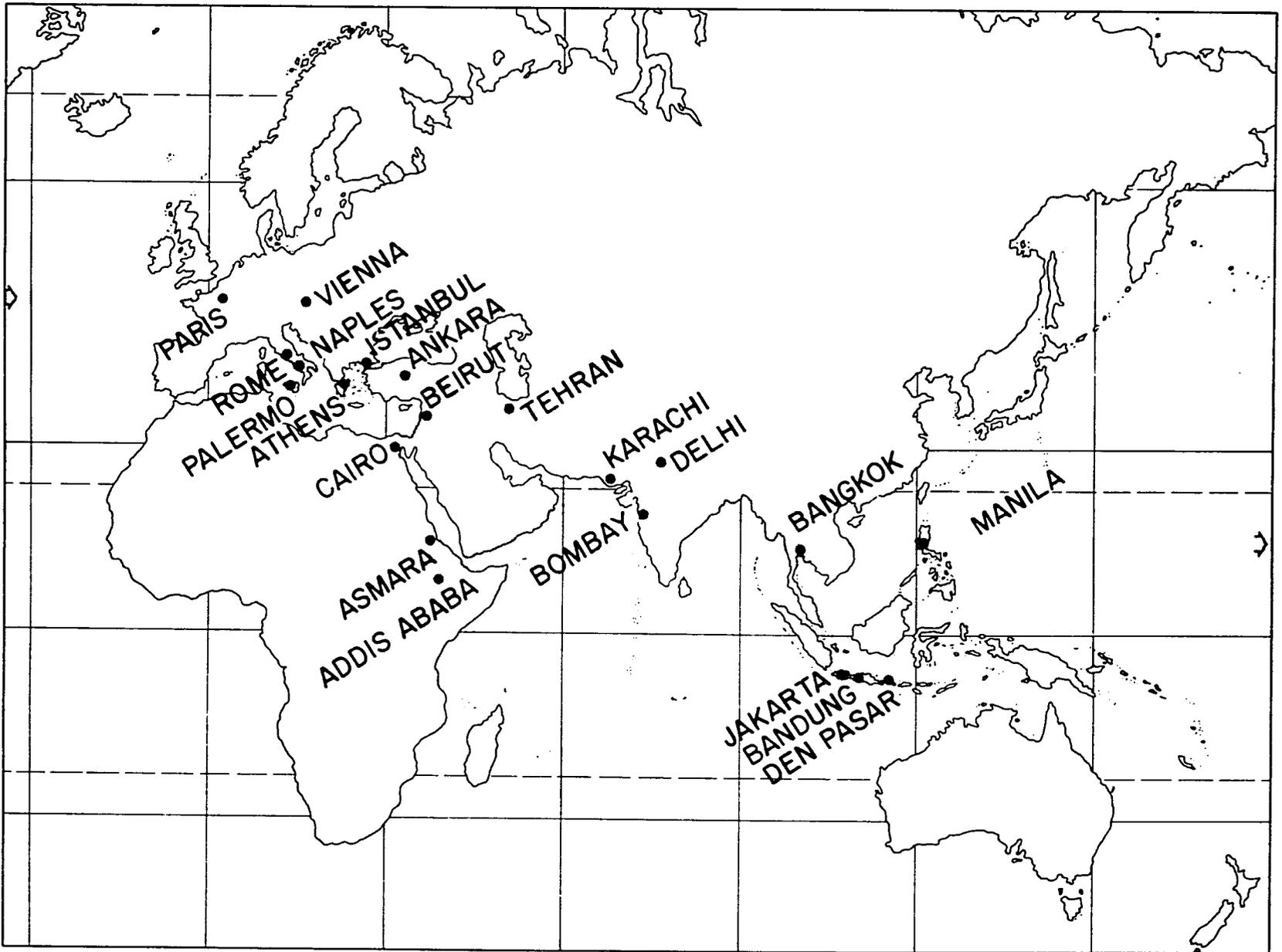
December 19	Istanbul, Turkey
December 20-21	Ankara, Turkey
December 22-23	Istanbul, Turkey
December 24-31	Tehran, Iran

Woodcock and Lieberman

January 1-2, 1956	Cairo, Egypt
January 3-4	Sirs-el-Layyan and Fischa, Egypt

January 5-7	Cairo, Egypt
January 8-10	Addis Ababa, Ethiopia
January 11	Uoliso, Ethiopia
January 12-15	Addis Ababa, Ethiopia
January 16-17	Asmara, Eritrea
January 18-20	Addis Ababa, Ethiopia
January 21-22	Karachi, Pakistan
January 23-27	New Delhi, India
January 28	Agra, India
January 30	New Delhi, India
January 31	Aligarh and Adhon, India
February 1	New Delhi, India
February 2-3	(Woodcock:) Bombay, India
February 4	New Delhi, India
February 5-8	Jakarta, Indonesia
February 9-10	Bandung, Indonesia
February 11	Sukabumi and Tjisaat, Indonesia
February 13	Den Pasar, Indonesia
February 14-17	Jakarta, Indonesia
February 18-20	Bangkok, Thailand
February 22-27	Manila, Philippines
February 28	Bacolor, San Fernando, Guagua, and Santo Tomas, Philippines
February 29-March 2	Manila, Philippines
March 5	Arrive San Francisco, California

B-3



Appendix C

PERSONS AND ORGANIZATIONS  
FURNISHING INFORMATION TO THE SURVEY TEAM

Sincere thanks are due all the following individuals and staff of organizations whose ready help made this report possible:

San Francisco:

The Asia Foundation  
Dr. Wing Shau Chan, Stanford University  
Richard P. Conlon, International Consultant  
Dr. Norbert Einstein, International Consultant  
Dr. Paul Hanna, Stanford University  
Gardner Hart, Audio Visual Director, Oakland Public Schools  
Dr. Francis Noel, Director, Audio Visual Education, State of California  
Dr. Wilbur Schramm, Stanford University  
J. Graham Sullivan, International Vocational Education Specialist  
David Warner, Office of Private Cooperation, USIA

Chicago:

Elihu Katz, University of Chicago  
Prof. Theo. W. Schultz, University of Chicago  
Douglas Waples, University of Chicago  
Business Screen Magazine  
Educational Screen Magazine  
Encyclopaedia Britannica Films, Inc.  
Popular Mechanics Magazine  
Sears Roebuck & Company

Toronto, Ontario:

Ontario Research Foundation  
Do-It-Yourself Exposition, Toronto Arena

Washington, D. C.:

International Cooperation Administration  
Office of Technical Services, U. S. Dept. of Commerce  
U. S. Information Agency  
Dr. Floyd Brooker, D.A.V.I., National Education Association  
Russell Wright, designer

New York:

United Nations Technical Assistance Administration  
United Nations Technical Assistance Board  
The Ford Foundation  
Dumont International Division  
Radio Corporation of America  
Popular Science Magazine  
World Literacy Movement  
Franklin Publications, Inc.  
Kenneth Holland, Director, Institute of International Education  
Dr. Franklin Kellar, American Vocational Education Association  
John Wiley & Sons, Inc.  
Jerome Barnum & Associates, Scarsdale  
E. L. Bernays, Chairman, National Committee for an Adequate Overseas  
U. S. Information Program  
Dr. Phillips Talbot, Director, American Universities Field Staff, Inc.

Paris:

U. S. Operations Mission/France  
U. S. Regional Office, liaison to O.E.E.C.  
European Productivity Agency  
Unesco  
Audio-Visual Center, A.F.A.P. (French Productivity Assn.)  
Industrial Information Center, A.F.A.P.  
Documentation Center, A.F.A.P.  
Ministry of Education  
Associated Press Bureau

Vienna:

U. S. Operations Mission/Austria  
U. S. Information Service  
U. S. I. S. Reading Room  
Austrian Productivity Center (OPZ)

Rome:

Economics Division, U. S. Embassy  
U. S. Operations Mission/Italy  
U. S. Information Service  
U. S. I. S. Library  
U. S. Military Assistance Advisory Group, Italy  
CONFINDUSTRIA

Rome (Continued):

Ministry of Industry and Commerce  
Ministry of Transport, Technical Film Service  
ANV (National Glass Industry Association)  
BPD (Bombrini-Parodi-Delfino)  
CIDA (Italian Confederation of Business Executives)  
CNP (Italian National Productivity Committee)  
Compagnia Nazionale Artigiana  
EACIA, Rag. Nicolardi, General Secretary  
ENI (Italian Oil Company)  
ENPI, National Accident Prevention Society  
FACE (IT&T Affiliate)  
FAO, Food and Agriculture Organization of the United Nations  
Ing. Fazi, construction consultant  
Giovanetti Macchine SRL  
Montemiata, chemical manufacturers  
Ing. Flaviano Moscarini, consulting automotive engineer  
Ing. G. B. Ormea, President, CISA, civil engineers  
Pirelli Rubber Company  
Dr. Guido de Rossi del Lion Nero, Secretary General, Italian Public  
Relations Society

Palermo, Sicily:

Palermo Production Center of CNP, and U. S. advisory staff  
SICINDUSTRIA  
Azienda Brescia Costruzione (ABC), civil engineers  
Umberto Baldini, Vice President, Sec. Montecatini, Milano  
Bellanca & Amalfi, clothing manufacturers and distributors  
CISAS, gear manufacturers  
Palma bakers  
Societa Generale Electricita di Sicilia

Naples:

Naples Chamber of Commerce, Industry and Agriculture  
Societa Apparecchiature Elettriche  
Unione degli Industriali della Provincia di Napoli  
Prof. Ing. Guido Gambardella, University of Naples

Athens:

U. S. Operations Mission/Greece  
U. S. Information Service

Athens (Continued):

U. S. I. S. Library  
Greek Productivity Center (ELKEPA)  
Greek Small Industry Association  
Mr. Averov, handicrafts organizer  
Federation of Greek Industrialists  
Industrial Trade Association  
Mr. Vizas, furniture manufacturer, Union of Cooperatives of Small  
Industries

Araxova and Levadia, Greece:

2 textile weavers, 2 small cotton mills, 1 shoemaker, 1 furniture  
manufacturer, 1 textile cooperative

Istanbul:

U. S. Information Service  
U. S. I. S. Library  
Turkish Technical Information Center  
Dr. Duncan Ballantine, President, Robert College  
Fehedrin Gozum, textile exporter-importer  
Industrial Development Bank of Turkey  
Paul Karlen, technician on handicrafts research  
Labor Institute for the Near and Middle East (ILO)  
Naokazu Okuda, Japanese Commission to Unesco

Ankara:

U. S. Operations Mission/Turkey  
U. S. Information Service  
Turkish Union of Chambers of Industry and Commerce  
Dean Bedri Gürsoy, University of Ankara  
Pan American Airways/Turkish Airlines Project

Tehran:

U. S. Operations Mission/Iran  
U. S. Information Service  
U. S. I. S. Library  
Ministry of Mines  
Ministry of Industry  
Plan Organization  
The Ford Foundation, rural industry representative

Tehran (Continued):

Shahrokh Firouz, rural landowner  
Franklin Publications, Inc.  
Taban Printing Company

Beirut:

U. S. Operations Mission/Lebanon  
U. S. Information Service  
Lebanon Industry Institute  
American Universities Field Staff  
Association of Lebanese Industrialists  
Ecole d'Arts et Metiers  
Economics Research Institute, American University of Beirut  
The Ford Foundation, Office of Near East Representative  
Graham Associates Corporation  
Overseas Program Director, Near East Foundation  
Trans-Arabian Pipe Line Training Center, Sidon

Cairo:

U. S. Operations Mission/Egypt  
U. S. Information Service  
U. S. I. S. Library  
Atoms for Peace Exhibit  
Franklin Publications, Inc.  
Scientific Controller, National Research Council  
Senator Galal Hussein, entrepreneur  
Henri Rabbath, Delta Trading Co. and affiliates

Sirs-el-Layyan, Egypt:

Arab States Fundamental Education Center

Addis Ababa:

U. S. Ambassador to Ethiopia  
U. S. Operations Mission/Ethiopia  
U. S. Information Service  
U. S. I. S. Library  
Director General, Ministry of Education  
Acting Director General of Industry, Ministry of Commerce and Industry  
Development Bank of Ethiopia  
Her Imperial Majesty's Handicraft School

Addis Ababa (Continued):

Food & Agriculture Organization (Ethiopia)  
Director, College of Technology  
Director, Vocational Trade School  
Commercial Printing Company  
Ethiopian Air Lines  
Oda Freres Tire Recapping Service  
Paul Ries & Sons (Ethiopia) Ltd.  
Truwerk Aluminium Company, Ltd.

Asmara, Eritrea:

U. S. Point Four Program for Eritrea  
Assistant to Director, Industry and Commerce, Secretariat of Economic Affairs  
Eritrea Chamber of Commerce, Industry and Agriculture  
Government Printing Office  
INCODE S/A Meat Packing Company  
Industria Ceramica  
Melotti Brewery  
SAVA Glass Works

Karachi:

Pan American Airways Technical Assistance Program to Pakistan  
Shamim Ahmed, political and diplomatic correspondent, "Dawn"

New Delhi:

U. S. Charge d'Affaires  
U. S. Technical Cooperation Mission (U.S.O.M.)/India  
U. S. Information Service  
U. S. I. S. Library  
United Nations Information Center  
Development Wing, Ministry of Commerce and Industry  
Director of Training, Community Projects Administration  
Technical Education Advisor, Ministry of Education  
Office of Commissioner for Small Scale Industry, Ministry of Commerce & Industry  
Deputy Director, Small Industry Service Institute  
E. P. W. Da Costa, Editor, "The Eastern Economist"  
The Ford Foundation  
Thomas Keehn, Cooperative League of U. S. A., and American International Association for Economic and Social Development  
Frank Mayer Engineering Company

Alipur, India

Cottage Industries Community Project

Bombay:

U. S. Vice-Consul  
Regional Industrial Development Officer, U. S. Technical Coop'n. Mission  
U. S. Information Service  
U. S. I. S. Library  
Small Industry Service Institute  
All-India Manufacturers Organization  
International Correspondence Schools (Overseas) Ltd.  
Harshadray Ltd.  
Poysa Industrial Company  
Trade Commissioner for Indonesia  
Mr. Evelyn Wood, communications specialist

Jakarta:

U. S. Charge d'Affaires  
U. S. Operations Mission/Indonesia  
U. S. Information Service  
U. S. I. S. Library  
Dept. of Institutes and Training, Ministry of Economic Affairs  
Industrial Research Institute  
Chief, Technical Institutes, Dept. of Industry  
Chief, Administration, Dept. of Industry  
Small Industries Development Corp., Directorate of Industry  
Resident Representative, United Nations  
Chief United Nations Advisor to Dept. of Industry  
United Nations Consultant on Textbook Production  
Unesco Mission to Indonesia  
Unesco Southeast Asia Science Cooperation Office  
Sungar Alurmei, hotel manager and 1955 ICA participant to U. S.  
The Ford Foundation  
Franklin Publications, Inc.  
Indonesian State Railways, Foreman Training Dept.  
William Palmer, U. S. Film representative  
Perusahaan Sepeda Sehat, bicycle factory  
Ridaka Textile Company, Pekalongan  
Standard Vacuum Oil Company  
J. G. White Engineering Corporation

**Bandung:**

Inspector, Industry Service, Java Barat  
Ceramics Institute  
Indonesian Military Police, Training Division  
Materials Testing Laboratory  
Normalisatisraad (Standardization Office)  
Regional Housing Center, U. N. Technical Assistance Administration  
Technical Teacher Training Institute (Dunwoody Project)  
Textile Institute  
Vocational Training Center, I. L. O.  
American Universities Field Service

**Sukabumi, Indonesia**

Branch Office, Department of Industry  
Wan Tji strawboard factory  
Sunda Rubber Industries N. V.

**Tjisaat, Indonesia**

Bakti Sikat Industri, brush factory  
Sukanta blacksmithy

**Den Pasar, Indonesia**

Industry Service Office, Sunda Ketjil Province, Dept. of Industry

**Maas, Indonesia**

Small woodcarving and silverware manufacturers

**Bangkok, Thailand**

Staff of Division of Industry and Trade, ECAFE

**Manila:**

U. S. Operations Mission/Philippines  
U. S. Information Service  
U. S. I. S. Regional Production Center  
Philippine Industrial Development Center  
National Media Production Center  
Assistant Director, Vocational Education, Division of Public Schools  
Director of National Planning, National Economic Council

Manila (Continued):

Home Industries Dept., National Marketing Corp. (NAMARCO)  
Home Industries Division, Bureau of Public Schools  
Industrial Promotion Division, Dept. of Commerce and Industry  
Vocational Training Section, Dept. of Education  
Resident Representative, United Nations  
American Chamber of Commerce in the Philippines  
American Universities Field Staff  
Ang Tibay Shoe Factory  
The Philippine Association  
Purdue-ICA-Taiwan University Educational Engineering Project

Bacolor, Luzon, P. I.

Pampanga Province Branch, Bureau of Commerce  
Philippine School of Arts and Trades

Guagua, Luzon, P. I.

Wood and metal working shops

San Fernando, Luzon, P. I.

Woodworking shops

Santo Tomas, Luzon, P. I.

Ceramics manufacturers and kilns

## Appendix D

### RESEARCH TECHNIQUES EMPLOYED

The impossibility of a quantitative study of the problem was apparent from the start. Even in studies of audiovisual aids in an American school situation, with a relatively stable and homogeneous universe capable of at least general delineation, it has been a long and painstaking effort to obtain meaningful data. A quantitative approach would be infinitely more complex in underdeveloped areas, where statistics are seldom available, where controlling factors can seldom be suspected, much less isolated, where audiovisual aids are not a separable tool, and where application of research techniques are often disruptive in themselves. All of this is quite aside from the need for a reasonably early answer, to assist in planning an operation which is already deeply involved.

A qualitative approach had to be accepted, as devoid of subjective factors as possible. The SRI team, therefore, applied these four principles:

1. It would interview as broad a cross section of knowledgeable people as possible, but constructing that cross section by giving weights to balance the known special viewpoints and prejudices, including those of the team itself.

2. It would make every effort to obtain candid answers, by all available interviewing techniques and by assurances that (a) the team represented a private research organization rather than government, (b) the project was not an inspection or evaluation of personnel, and (c) all replies would be kept in complete confidence. (For this last reason, no sources are specified in this report.)

3. It would seek out all available quantitative data, and field test them for validity in the same way that replies in interviews had to be assessed, i.e., by weighting various factors involved. (Practically no data were uncovered with enough validity to use as a basis for action.)

4. It would observe first-hand as diverse a sample as possible, seeking meaningful ideas which could then be tested.

As it turned out, the dominant impressions which resulted from the application of these four principles were so clearly in one direction that it was possible to fashion general recommendations with some

confidence as to their usefulness. However, the team was well aware as it wrote this report that only 12 countries were visited, and that even though these represented a certain kind of cross section, the results might not be valid in the worldwide context.

It is all the more important to recognize this limitation when consequences are considered. For instance, there are some 10,000,000 hand looms in use in India alone. Any action recommended which would affect hand-loom production would have major repercussions in India; and because of India's key position in Asia, the worldwide repercussions must likewise be considered. When this kind of figure is multiplied by all of the variety of specifics involved, in all the varieties and numbers of peoples, the consequences are of fundamental significance.

The only responsible course open to the team was to propose various actions which appeared feasible and useful, and to put them in general context and in relation to each other, so that the appropriate administrators can make the policy decisions involved, on the basis of much broader knowledge than the team could conceivably accumulate.

## Appendix E

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Appendix F

ABBREVIATIONS USED

BLS	Bureau of Labor Statistics, U. S. Dept. of Labor
CCP	Coordinator of Communications Programs
CIPM	Council for International Progress in Management
ECAFE	Economic Commission for Asia and the Far East
ECE	Economic Commission for Europe
ECLA	Economic Commission for Latin America
EPA	European Productivity Agency
FAO	Food and Agriculture Organization of the United Nations
GPO	Government Printing Office (U. S.)
ICA	International Cooperation Administration
ICA/W	International Cooperation Administration, Washington
ILO	International Labor Organization
IMA	International Management Association
IMG	Informational Media Guarantee
ITEP	International Technical Exchange Program
ITID	Industrial Technical Information Division
ITIO	Industrial Technical Information Officer
NICB	National Industrial Conference Board
OAS	Organization of American States
OAVS	Overseas Audiovisual Services



OEEC      Organization for European Economic Cooperation

OTS      Office of Technical Services, U. S. Dept. of Commerce

PAO      Public Affairs Officer

SBA      Small Business Administration

SRI      Stanford Research Institute

TAB      Technical Aids Branch (of ICA)

TID      Technical Information Division

TIO      Technical Information Officer

UN      United Nations

Unesco    United Nations Educational, Scientific, and Cultural Organization

UNTAA    United Nations Technical Assistance Administration

UNTAB    United Nations Technical Assistance Board

USIA      United States Information Agency (Washington)

USIS      United States Information Service (Overseas)

USOM      United States Operations Mission (of ICA)