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DRAFT PROPOSALS FOR THE 1963 WORLD PROGRAMME OF BASIC
INDUSTRIAL INQUIRIES

I. Introduction

1. At its twenty-sixth session the Economic and Social Council, recognizing the need for internationally comparable data on the structure and activities of industry in order to deal with basic questions of economic and social development, recommended that the Governments of Member States compile basic data on industry for 1963 or a year close to 1963. It was suggested that as far as possible, account be taken of the international recommendations on this subject which are designed to improve the international comparability of the data.^{1/} The Statistical Commission, at its tenth session, invited the Secretary-General to prepare the draft proposals regarding inquiries which are to be a part of this world programme.^{2/} It was intended that these proposals include recommendations relating to the coverage and the items of data to be sought and their classification according to characteristics of the statistical unit. The purpose of this paper is to present, for the views of Member Governments and interested international bodies, a set of such proposals based on the Draft Revisions in the International Standards in Basic Industrial Statistics.^{3/}

2. The action of the Economic and Social Council and the Statistical Commission was taken in recognition of the urgent need at both the national and international levels for internationally comparable data on industry.^{4/} That many countries also recognize the need for such data is attested to by the fact that nearly

^{1/} See Report of the Economic and Social Council, A/3848, para. 387 and Resolution 676 B (XXVI).

^{2/} See Report of the Tenth Session of the Statistical Commission to the Economic and Social Council, E/3126, para. 26.

^{3/} E/CN.3/L.40/Rev.1.

^{4/} See Report of the Tenth Session of the Statistical Commission, E/3126, para. 23.

sixty countries have indicated their intentions to collect comprehensive information on industry for 1963 or a proximate year, while others have indicated that they would consider shifting the date of their industrial inquiries to the year adopted for the world-wide programme.

3. The Draft Revisions to the International Standards in Basic Industrial Statistics^{5/} were designed to serve two general purposes - (i) to standardize definitions of items of data to the end that national statistics could be usefully compared on an international level and (ii) to provide a realisable goal for countries still at an early or medium stage in the development of their basic industrial statistics programme. The standards, therefore, do not in any sense represent a minimum programme. Equally they are not intended as a maximum programme and in fact the systems of basic inquiries in force in a number of countries exceed in many respects the specifications of the international standards by a considerable margin.

4. In formulating the programme here presented for a world-wide series of industrial inquiries, the aim has been to include items of data for collection and tabulation that are within the capabilities and resources of those countries newly embarking on a statistical programme. Further, emphasis is put on those items of data and tabulations which represent a minimum body of information for useful economic analysis on an international level. If, then, all countries participating in the 1963 programme find it possible to collect and compile at least those items of data suggested here and to use the proposed definitions of these items, the world programme can provide an invaluable means for the comparative study of the structure and activities of industry throughout the world. It is envisaged that this programme will be the subject of regional study and consultation and it may well be that some regions may wish to adopt a more ambitious minimum programme on a regional basis where it is felt that all of the countries of that region are in a position to carry out a more extensive undertaking.

5. The emphasis of this paper on the international usefulness of the 1963 census programme should not, of course, obscure the fact that, for those

countries wherein an industrial statistics programme has yet to be started or where a comprehensive industrial survey has never been undertaken, the proposed census should provide valuable material for internal analysis and economic planning. Further the inquiry should furnish the lists of industrial establishments and the benchmark data so necessary for the efficient design of a system of annual and current surveys.

II. Reference Period, Coverage and the Statistical Unit

6. The reference period suggested is, of course, the calendar year 1963 or a calendar year as close to 1963 as possible. Deviations may be accepted, however, in individual cases where the records of the statistical unit make it difficult or impossible to provide the required data on other than a fiscal year basis.

7. It is suggested that the coverage of the inquiry be that proposed for an infrequent inquiry in the International Standards,^{6/} - i.e., the data compiled should relate to all establishments primarily engaged in mining, manufacturing, construction and the production of electricity, gas and steam. It is recognized, however, that the problems of including the construction industry, particularly in a first or early inquiry, will undoubtedly cause a number of countries to omit this industry from their 1963 plans.^{7/}

8. As stated in the proposed International Standards^{8/} "the aim of the infrequent inquiry is to provide, with reasonable accuracy, an analysis of the structure of industry and benchmark data regarding its activities. The coverage of the field envisaged to accomplish these aims may, of course, be attained either through a complete census, a probability sample or derivation of the data for compilation from administrative records, or any combination of these methods which can provide data of the required accuracy at a reasonable cost". This aim, of course, must be examined in the light of the resources

^{6/} E/CN.3/L.40/Rev.1, Annex 1.

^{7/} See also E/CN.3/L.40/Rev.1, para. 15.

^{8/} E/CN.3/L.40/Rev.1, Annex I, para. 3.

available, in terms both of the availability of technically qualified personnel and money. Certain countries, for example, where the level of industrial development is very high, find that the overwhelming proportion of their industrial activity takes place in larger units and that the additional cost of including very small units is not warranted in terms of any possible increase in the accuracy or completeness of their statistics. On the other hand, some countries may find that due to limitation of resources, both financial and personal, the scope of the inquiry must be curtailed. In this latter case, area sampling techniques may be particularly useful in attaining coverage of the smaller units within reasonable cost and time limits.

9. The statistical unit recommended is the establishment as defined in the International Standards.^{9/} While the use of the establishment concept poses certain problems in a few cases, its adoption as the basic statistical unit is recommended for the 1963 programme on three counts:^{10/} (a) it is, at the present time, the unit most generally in use for industrial inquiries; (b) being restricted to a single or main kind of activity (industry), data related to the establishment are readily classifiable to homogeneous industry groups; and (c) because of the single location requirement, establishment based data are readily aggregated at virtually any level of an area classification for the purpose of regional analyses. It is apparent that with respect to the tabulation plan suggested for the 1963 programme, the second point is of especial interest.

III. Items of Data

10. The minimum list of items of data that are recommended for collection by all countries is presented in Table A of the Annex. This list has been drawn from the full set of items contained in the International Standards.^{11/} This

^{9/} E/CN.3/L.40/Rev.1, Annex I, para. 9-15.

^{10/} See also The Choice of an Appropriate Statistical Unit for Economic Inquiries, E/CN.3/244, for a fuller discussion of the establishment and other possible statistical units.

^{11/} E/CN.3/L.40/Rev.1, Annex II.

minimum list contains only those items that are reasonably easy to collect and that are important for international as well as national analyses of industry. In making this choice, emphasis was laid on employment data, which are essential in describing the structure of industry, and on those items of data that are essential for making reasonable estimates of "census value added" for the more important industry groups. In this connexion it should be recognized that while, from the items of data suggested for collection from the small establishments only rather gross estimates of census value added can be made, the percentage contribution of the small establishments to value added, for most industries, will be relatively small compared to the contribution of the larger units. Rather large errors in the estimates of the census value added by small units could therefore be accepted without seriously affecting the totals of value added for the industry as a whole.^{12/}

11. It is not, of course, possible to adopt a uniform definition of what constitutes a "large" as opposed to a "small" establishment. It is suggested, however, that the distinction be based on size in terms of the number of persons engaged. Further it is suggested that large establishments might be defined on the basis of the availability of records concerning the items of data required. That is, establishments above a certain size that in general are known to maintain at least minimum records concerning employment, wages and salaries, shipments or sales and costs might be considered "large".

IV. Proposed Tabulation Programme

12. Full use, of course, cannot be made of national industrial data on an international level unless these data are tabulated in a comparable fashion. In the Annex to this paper, therefore, are set out the kinds of tabulations recommended for both the items of data suggested for collection and for certain derived aggregates. It will be noted that not all of the items recommended for collection are suggested for tabulation. It is felt, however, that collection of these items is necessary to assure the accuracy of the totals of which they are the constituent parts. In seeking data on the total number

^{12/} See also para. 13 below.

of persons engaged, for example, it is advisable to request separately the figures relating to working proprietors, unpaid family workers, home workers and employees, even though tabulation of the categories other than total engaged and employees is not recommended. In this connexion it should be borne in mind that the items of data here recommended for tabulation are those of primary interest for international analysis. It is, therefore, quite possible that countries may find the tabulation of additional items of interest for their own use.

13. It should be noted that the "census value added",^{13/} which is one of the most important derived figures to be tabulated, can be only approximated from the minimum list of items suggested for collection from large establishments. The three items of data not recommended for collection in this minimum programme which would be required to compute "census value added" are: (a) value of fixed assets produced on own account, (b) changes in stocks of work in process (changes in stocks of raw materials and finished goods would also be required, if input and output data are collected on a "delivery" and "shipment" basis), and (c) cost of repair and maintenance work purchased from others. These three items are not suggested because of the difficulties generally encountered in their collection and because the error introduced in the aggregate value added figures by ignoring these items will, in general, be relatively minor. For the small establishments, of course, it is not possible to compute directly even this approximation of the census value added, but within each industry group the data are available for making a reasonable estimate of this figure. It is known, for example, that the value added must lie between the total gross receipts reported and the total wages and salaries paid. Within this range the amount that must be deducted from gross receipts might be estimated on the basis of the group of establishments of smallest size, within each industry group, for which the full list of items is available.

14. In Annex III of the Draft Revisions to the International Standards in Basic Industrial Statistics,^{14/} are set out the kinds of tabulations recommended for

^{13/} See E/CN.3/L.40/Rev.1, para. 123-125 for a description of "census value added".

^{14/} E/CN.3/L.40/Rev.1.

data obtained in an infrequent inquiry. Of the eight kinds of tabulations there proposed, the two most universally useful are those that distribute the items of data by detailed industry and by industry (or industry group) and size of establishment,^{15/} and these are the tabulations proposed for the world programme. Other tabulations are, of course, of nearly equal interest in coping with planning or development problems within a country and it is anticipated that many countries will wish to adopt a more complete tabulation plan than that suggested for this minimum programme.

^{15/} Columns (1) and (4) of Table A, Annex III, E/CN.3/L.40/Rev.1.

ANNEX

ITEMS OF DATA RECOMMENDED FOR TABULATION AND COLLECTION IN THE
1963 INDUSTRIAL CENSUS PROGRAMME

1. In the attached Table A are set out the items of data to be tabulated, the kinds of tabulations to be made and the items of data it is necessary to collect in order to provide the proposed tabulations. Also indicated are those items of data recommended for collection only from the larger establishments.
2. Definitions of the proposed items of data are to be found in Annex II of Draft Revisions to the International Standards in Basic Industrial Statistics, E/CN.3/L.40/Rev.1, and a full description of the two kinds of tabulations proposed can be found in Annex III of the same document. The notation used in Table A is as follows:

I - An entry of I in columns (1) or (2) indicates that, for international comparability, the industrial classification utilized for the distribution of the item should be convertible to the International Standard Industrial Classification of All Economic Activities^{1/} at the three digit (group) level.

M - An entry of M in columns (3) or (4) indicates which items of data are recommended for collection and the kinds of establishments from which these items should be sought.

^{1/} Statistical Papers, Series M, No. 4, Rev.1.

TABLE A - ITEMS OF DATA TO BE COLLECTED AND TABULATED

	To be Tabulated		To be Collected	
	By Industry	By Industry Group and Size Class	From All Establishments enumerated	From large establishments only
	(1)	(2)	(3)	(4)
A. Establishment Characteristics				
1. Kind of activity (industry)			M	
2. Size of establishment			M	
B. Number of Establishments	I	I		
C. Total number of Persons Engaged during a Single Period of the Inquiry Year				
1. Number of working proprietors (not applicable to any incorporated enterprise)				M
2. Unpaid family workers (not applicable to any incorporated enterprise)				M
3. Home workers (not applicable to mining, construction or utility industries)				M
4. Total number of paid employees	I	I		M
D. Total Wages and Salaries Paid during the Inquiry Year	I	I		M
E. Capacity of Installed Power Equipment^{1/}				
1. Prime movers not driving generators	I	I		M
2. Electric motors				M
3. Electric generators				M

^{1/} Sum of items 1 and 2 listed below.

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TABLE A - ITEMS OF DATA TO BE COLLECTED AND TABULATED (cont'd)

	To be Tabulated		To be Collected	
	By Industry (1)	By Industry Group and Size Class (2)	From all Establishments enumerated (3)	From large establishments only (4)
F. Total Value of Goods and Industrial Services Delivered or Consumed During the Inquiry Year <u>2/</u>	I	I		
1. Value of raw materials supplied, etc.	I			M
2. Value of fuels	I			M
a. value of quantity of individually important fuels	I			M
3. Value of goods to be sold in the same condition as purchased				M
4. Quantity of Electricity Consumed During the Inquiry Year <u>3/</u>	I			
a. value and quantity of electricity purchased	I		M	
b. quantity of electricity generated	I		M	
c. value and quantity of electricity sold to others	I		M	
5. Cost of contract and commission work done by others during the inquiry year				M
G. Total Value of Goods Shipped or Produced and Services Rendered to Others <u>4/</u>	I	I		
1. Value of all products of the establishment	I		M	
a. value and quantity of individually important products	I		M	

2/ Sum of items 1, 2, 3, 4a and 5 listed below.

3/ Sum of items a and b less item c listed below.

4/ This total in addition to the three items listed below it, would include the value of any electricity sold (item F.4.c. above).

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TABLE A - ITEMS OF DATA TO BE COLLECTED AND TABULATED (cont'd)

	To be Tabulated		To be Collected	
	By Industry (1)	By Industry Group and Size Class (2)	From all Establishments enumerated (3)	From large establishments only (4)
2. Value of goods shipped in the same condition as purchased			M	
3. Receipts for work done or services rendered to others			M	
H. Value Added ^{5/}	I	I		

^{5/} Item G less item F.



NOTES ON THE PLANNING AND PROGRAMMING OF SURVEYS FOR THE 1963 WORLD
PROGRAMME OF BASIC INDUSTRIAL INQUIRIES

I. Introduction

1. There are, basically, three facets of an industrial survey. The first - that concerned with objectives - is covered in The Draft Revisions to the International Standards in Basic Industrial Statistics.^{1/} In the same area, the Draft Proposals for the 1963 World Programme of Basic Industrial Inquiries^{2/} specifies a minimum programme that would reach the objectives envisaged by the Economic and Social Council when a world-wide system of basic industrial inquiries related to 1963 was recommended.^{3/} These proposals - which include recommendations concerning the coverage of the recommended inquiries, the items of data to be sought and the tabulation of these data - are drawn from the more ambitious programme, for infrequent inquiries, embodied in the proposed international standards.

2. The second facet of an industrial survey is dealt with in Methods of Obtaining Industrial Statistics.^{4/} These alternative approaches to the collection of data in both annual and infrequent inquiries are discussed together with their advantages and disadvantages.

3. The purpose of this paper is to examine in some detail the mechanics of planning and preparing for a large-scale survey and to suggest some of the things which may promote a smooth functioning of the survey machinery. Since it is anticipated that a number of countries participating in the world programme

^{1/} E/CN.3/L.40/Rev.1.

^{2/} E/CN.3/L.49.

^{3/} Report of the Economic and Social Council, A/3848, Resolution 676 B(XXVI).

^{4/} E/CN.3/L.40/Rev.1/Add.2.

will have had little or no experience in the planning and conduct of a large-scale economic survey, the present paper is intended to serve as a brief description of the steps involved in conducting an industrial survey and as an indication of the rather intensive and detailed planning that must precede such an inquiry. Questions relating to procedures and to the resources that must be mobilized are considered as well as the problem of organizing and integrating the several phases of the survey. In part, the paper summarizes information already published in Industrial Censuses and Related Enquiries.^{5/} Particular attention is given here, however, to certain points - some seemingly minor - the neglect of which has in fact caused considerable difficulty in the past.

4. Since it is expected that the 1963 world programme of industrial inquiries will be the subject of discussion at various regional meetings and seminars, it is hoped that national statistical authorities will comment freely on the methodological outline here set out. Comments on the following points would be particularly valuable: (i) the steps in planning, preparation and execution of a survey that require more emphasis than given in this paper; (ii) difficulties that have arisen in practice which have not been adequately dealt with here; and (iii) those procedures and techniques adopted for coping with such difficulties and problems as have been encountered. By providing this information, countries will be contributing to an internationally available body of data to be shared by all, especially by those whose experience in this field has been limited.

^{5/} Studies in methods, Series F, No. 4 (2 volumes), United Nations, New York, October 1953.

II. Planning a Comprehensive Industrial Survey

A. Introduction

5. The collection and compilation of comprehensive data covering the whole, or a large part of a nation's industry is a mass production operation. And like any other mass production operation, it depends for its success on the careful phasing of each component step. The necessary parts and sub-assemblies that go into the final product must all be at hand and flow into the main stream of operations at the proper moment. To programme such an operation requires not only a knowledge of industrial statistics, but even more, a high degree of administrative skill coupled with a meticulous attention to detail. Not infrequently a lack of sufficient attention to detail in the planning and preparatory stages has, in the past, been an important cause of the failure or limited success of a number of industrial as well as other large-scale surveys.

6. Attached as an Annex to this paper is a list of the main phases of an industrial survey - planning, preparatory work and execution - together with the more important steps involved in each. The Annex also indicates the schedule for each step of a hypothetical survey on the assumption that the enumeration stage is to begin in February 1964. The schedule should not, of course, be considered definitive, but rather as a rough indication of the ordering of the operations and an equally rough indication of the length of time that should be budgeted for the completion of each. It should be noted, however, that the termination dates shown are rather more critical than the length of time allotted, since the interrelated nature of the system makes each step dependent on the completion of earlier work.

7. In drawing up these notes on the detailed steps required for the planning and execution of an industrial survey, certain, perhaps obvious, assumptions have been made. It is assumed, for example, that the necessary legal foundation exists - that is, that a government organization is functioning, endowed with the responsibility and authority for the collection of industrial data, and that there is a legal basis for the survey proposed.^{6/} Further, it is expected that one of the

^{6/} Op. cit., Studies in Methods, Series F, No. 4, Vol. I, Chapter X, outlines the organizational and legal provisions that should be the foundation of an industrial inquiry.

major national objectives of the 1963 survey will be to obtain an up-to-date or first basing point in an integrated system of industrial surveys. It is with this latter point in view that rather heavy emphasis is placed on the establishment of a good industrial directory.

B. The Industrial Directory

8. An industrial directory is essentially no more than a complete file of industrial establishments above a certain size. This file should contain at least the following information concerning each establishment - (1) name and address (physical location) of the establishment; (2) name of the owner (corporate or other); (3) whether the establishment is part of a multi-unit enterprise and if so, (a) the name and address of the head office, if the establishment is not the head office, or (b) the names and addresses of all constituent establishments, if it is the head office; (4) the major kind of activity (in terms of the industrial classification) of the establishment; and (5) the total number of persons engaged in the establishment. Further, a proper directory should be kept up to date - that is, there should be a mechanism whereby newly established units are picked up and units that go out of business are deleted.

9. The role of the industrial directory is an important one. Without it, each time the industrial establishments are to be surveyed it would be necessary to undertake an expensive and time-consuming field canvass to locate these units. Not only does the directory define the more important segment of the industrial universe, it also provides the information that makes it possible to give special treatment to the various kinds of industry. Even where a field canvass is necessary to supplement the coverage of industry afforded by the directory, use of a directory provides greater control of the canvassing operation and offers an assurance that the most important units are not skipped. Further, of course, an industrial directory is essential if a mail survey is contemplated, and the inexpensiveness of mail collection of data compared with other methods of collection is particularly appealing.

10. In those countries where participation in the 1963 programme is expected and where no industrial directory exists, planning for the directory could

begin at any time, but probably not later than the beginning of 1962. The planning for a directory consists primarily of searching out the available lists of industrial units that already exist - such as those that have grown out of the administration of social security or labour legislation or those compiled by trade associations, etc. These lists or records must be examined not only to determine their effective coverage of the industrial field, but to judge whether the records are kept in a form that allows for their easy utilization in compiling and maintaining directory lists. Judging the completeness of coverage offered by the administrative lists is not always an easy matter. To a certain extent a knowledge of the machinery and procedures used in compiling the list will be a good basis for an informed guess regarding the probable completeness of coverage. In many cases, however, the effectiveness of the list can be checked only by a field survey. Usually this would be done on a sample basis and often the directory check would be coupled with an area sample designed to gather data from the small establishments.

11. Administrative records need not contain all of the information required for the directory, but they should at least provide correct names and addresses of units operating in the industrial field. Equally, it is unimportant whether the records are maintained on an establishment or a company or enterprise basis. Since any information garnered from the records will have to be checked and supplemented by direct collection of simple questionnaires, it is sufficient that these records provide accurate and up-to-date names and addresses for all units above a certain size.

12. The quality of the administrative records from which lists of establishments might be obtained is likely to vary considerably from country to country. It is, however, from a long-range point of view, well worth a considerable effort to promote, through co-operation with the appropriate agencies, a systematic maintenance of such administrative records as can produce adequate lists of industrial units for the establishment and maintenance of a directory. In this connexion, it should be noted that to be a thoroughly adequate directory, it should probably contain at least all establishments employing ten or more persons. A directory can, however, be extremely useful even though it is complete only for establishments with twenty or more, or even fifty or more persons engaged, and it is advisable - again from a long-range point of view - to set up and maintain such a directory.

13. Where it is ascertained that existing records are not going to be able to yield lists that are sufficiently comprehensive, plans must be laid for a field canvass to locate and identify the industrial establishments. Since a field canvass requires some time and a considerable amount of money, these plans should be completed quite early. One technique that has been used to minimize the cost and time of canvassing the country involves the use of the normal governmental administrative apparatus in the rural or semi-rural parts of the country to develop lists of establishments with ten or more engaged. That is, the administrators of small districts are asked to submit the names and addresses of all industrial establishments operating in their area with an employment of ten or more. While this approach can be an effective one for the less densely populated districts, within the large towns and cities it is necessary to use field workers to systematically canvass the area to pick up all establishments with ten or more employed. It should be noted that a canvassing operation to locate and identify these larger establishments is a much more simple and rapid procedure than that which must be used for the location of the small units.

14. Decision on the form which the industrial directory will take is also important. The directory should be so set up that arrangement of the establishments by size, by industry, by geographic area or by economic organization is easy and rapid. In most countries now the necessary establishment data are carried on punched cards which can be rapidly handled mechanically. Where the appropriate machinery is available, plates or stencils carrying the name, address and the coded characteristics of each establishment are also prepared, and these can be used to automatically imprint this information on schedules and envelopes. In certain types of equipment the stencil and the punched card features are combined, and many plate systems provide a means for mechanically sorting the address plates according to key characteristics. With such equipment the directory data and the means of automatically handling the addressing operation are integrated, thus facilitating many of the preparatory steps for a survey.

C. Preliminary Design of the Survey

15. The first requirement in the development of an intelligent survey plan is to know in very precise terms the objectives of the survey. A statement of

these objectives should contain not only the items of data to be compiled and a definition of the field to which these are to relate, but it should also contain an estimate of the precision with which these items of data must be presented if they are to serve the purpose for which they are intended. Many of the survey objectives can best be displayed and codified in concrete terms by laying out in detail the final tables which will ultimately convey the results of the survey to the consumer. Thus in planning the industrial survey, attention will turn first to the design of the final tables and the tabulations from which these will be produced.

16. The table plans should not only indicate the items of data to be tabulated, but by which characteristics of the establishments each item of data is to be distributed. Further, the tables should show the extent to which data are required for detailed sub-divisions - of industry, geographic area, etc. These factors have a bearing on all subsequent plans and decisions. To the extent, for example, that detailed data are required for small geographic regions, to that extent will the possibilities of utilizing sampling methods be restricted. The table plan, together with the estimates of the degree of precision required, will also be a key element in translating the objectives of the survey into a realistic appraisal of the cost of attaining these objectives.

17. The table plans will also provide the basis for designing the questionnaires for the survey - in terms of the data to be requested, the organization of the schedule, the coding and processing requirements, etc. The processing procedures too will obviously be affected by the requirements of the table plans.

18. Formulating the objectives of the survey by the use of table plans has a further advantage. In virtually all countries, the knowledge that an industrial survey is to be undertaken results in a deluge of requests for the inclusion of questions of special - and sometimes questionable - interest to particular governmental agencies or others. Often the impossibility of including these questions can be demonstrated by showing that they cannot be translated into useful aggregates, or meaningfully tabulated for groups of establishments. And even where the requested data is reasonable from a statistical point of view, organizing the data in terms of the tables required can serve to demonstrate

the amount of added work and cost involved in their collection and tabulation.

19. As soon as the decisions have been made regarding the construction of a directory and the preliminary formulation of the table plans has been completed, the information is available for developing in preliminary fashion the over-all form which the survey will take. This preliminary survey plan will, of course, be designed to attain the stated survey objectives, taking into account the nature of the field to be covered. With the plan then, cost estimates can be prepared, personnel requirements estimated and a preliminary time schedule drawn up. At this point will begin a rather critical phase in the survey planning. Having established the costs and other requirements for reaching the originally stated objectives, it must be decided whether the money and other necessary resources are likely to be available to carry through on the plan devised. If the objectives, in all details, are considered essential, the draft plan will be the basis for requesting the funds necessary to conduct the survey as outlined. If, on the other hand, the original statement of objectives seems unrealistic in terms of their cost, or if the legislature finds it impossible to allocate the funds requested, the survey plan must be redesigned and the objectives restated in harmony with the funds and other resources at hand. In brief, the stated objectives, the survey design and the available resources of all kinds form an interacting set of factors which must, in the final analysis, form a consistent and balanced whole.

20. In preparing the outline and scheduling the steps listed in the Annex to this paper, it was of course necessary to postulate a particular kind of survey design. The assumptions on which the schedule and design are based are stated in the Annex, but perhaps the most important of these are, (i) that an adequate directory covering establishments with ten or more persons engaged could be compiled; (ii) that it would be necessary to use a field staff in the collection of questionnaires from both the large and small units; and (iii) that the small establishments would be located and enumerated by field enumerators who would canvass a representative sample of small areas throughout the country.

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D. Design of the Questionnaires^{7/}

21. For the type of survey envisaged for the 1963 programme, at least three basic questionnaires will be required - (1) a simple questionnaire to be used for gathering the necessary information for the directory; (2) a questionnaire designed to elicit the full set of data recommended for collection from the larger establishments - usually those employing ten or more persons; and (3) a simplified version of (2) for the collection of the required data from the small establishments.^{8/}

22. The two essential requirements of a good questionnaire are that it be clear and unambiguous, and that it be easy to use, both from the point of view of the respondent answering the questionnaire and of the processing personnel whose task it will be to translate the raw data into a convenient form for tabulation. To meet the first requirement entails the inclusion of definitions of the figures requested and instructions on how the answer is to be given. It is no good, for example, to request simply the value of the establishment's shipments without specifying how those shipments are to be valued - whether at the plant or delivered to the consumer, including or excluding taxes, rebates, etc. And usually it is best to include the general definitions and instructions in the questionnaire itself - particularly when the prospective respondents have had little or no previous experience with statistical reporting.

23. Meeting the second requirement will involve devising a good format for the schedule. Questions relating to the same general area (e.g., employment, wages and salaries) should be kept together; sufficient space and properly identified space should be provided so that the respondent knows exactly where his answers are to go; and processing requirements must be anticipated so that a sufficient number of easily identified spaces are provided for coding and computation.

^{7/} See also Industrial Censuses and Related Inquiries, op. cit., Vol. 1, Chapter XV, sections B and C.

^{8/} See Annex to Draft Proposals for the 1963 World Programme of Basic Industrial Inquiries, E/CN.3/L.49, for a list of these items of data.

24. From the foregoing it is apparent that the final design of the questionnaires - particularly those for use in the survey proper - will be influenced by two other preparatory steps to be described below - i.e., the personal visits to the establishments, and the design of the processing procedures.

E. Design of Collection Methods and Procedures

25. The various collection methods and the conditions under which they might be effectively used are described in Methods of Obtaining Industrial Statistics.^{9/} In those countries where it is possible to develop an adequate list of industrial units from administrative sources to serve as a foundation for a directory, a mail inquiry can probably be used to gather the rather simple data required for the directory. Whether it will be possible to rely on a mail inquiry for the collection of the more complex information required from the larger units in the survey proper, however, will depend on an assessment of the usual establishment's ability or willingness to supply the data without help or persuasion. If it is expected that a majority of the larger units will not respond promptly or accurately to a mail questionnaire, it would usually be best to make use of a directed field inquiry.^{10/} The assumption that a field staff would be needed will probably be the safest one in virtually all countries that have not been operating a regular industrial statistics programme for some years. In very few countries, of course, will it be possible to use a mail inquiry to gather data from the small establishments.

26. Planning a large-scale field operation that will function smoothly and efficiently is by no means a simple matter. The task consists essentially of two major elements - (1) formulation of instructions and training plans for the field enumerators and other matters pertaining to the statistical aspects of the survey; and (2) design of the organizational and administrative arrangements that will be the means by which a nation-wide staff can be efficiently

^{9/} E/CN.3/L.40/Rev.1/Add.2.

^{10/} An inquiry in which field personnel are assigned the specific establishments to be enumerated on the basis of a list or directory.

controlled.^{11/} While the training of the field staff will certainly influence the reliability of the survey, it is in the administrative arrangements that attention to details becomes imperative. Even a relatively limited sample survey frequently involves the employment of several hundred enumerators. Consequently any breakdown, even minor, in the organization, that results in loss of time or travel expenses, can be a very costly thing. In more than one case, for example, failure to set up the machinery necessary for paying enumerators their salary and travel costs while in the field resulted in the loss of several days work and a considerable increase in travel costs because personnel had to be sent specially into the field with the pay roll.

27. One of the more effective means of maintaining constant control over a staff of enumerators is to have a high supervisor to enumerator ratio. By so doing each enumerator's work can be kept under constant surveillance. Further, since it is obviously easier to maintain control if the field organization is relatively small, it may often be advantageous to employ a small enumerator force which can be moved from region to region. The limitation on this, of course, is imposed by the need to complete the over-all enumeration within a reasonable time.

28. Where a directory for the larger establishments exists, the mails are used for the distribution and field workers are employed to collect the questionnaires (as is assumed in the schedule of operations set out in the Annex), controls on the mailing should be devised and careful scheduling of the field work must be undertaken. The country should be divided into enumeration districts and enumerator teams allocated to each on the basis of the number of large establishments and the geographic area to be covered.

F. Design of Office Processing Procedures

29. Processing is the means whereby the schedules received are checked and scrutinized to guard against the introduction of errors due to poor or incomplete reporting. It is also the stage at which the raw data are put into a form

^{11/} For a more thorough discussion of the steps required in a training programme and the organizational requirements for a field survey, see Industrial Censuses and Related Inquiries, op. cit., Vol. 1, Chapter XIV, sections B-5, C-4 and D-5.

convenient for the final tabulation process. Quite obviously, therefore, the processing design will be related both to the requirements of the final tabulation stage and the design of the questionnaire. Equally, as mentioned earlier, the questionnaire design will be conditioned by the processing methods and the survey objectives and the design of both questionnaire and processing should proceed more or less concurrently.

30. The usual steps in a processing system and an indication of the several methods that might be used at each step are described in Industrial Censuses and Related Inquiries.^{12/} Here, as in the planning of collection procedures, it is important to lay out in advance the series of operations required. Editing procedures and coding systems must be decided upon; the punched card designs or other tabulation devices must be drawn up, and the personnel requirements determined. Provisions should be made for checking each step of the processing and the flow of material through each stage should be estimated to avoid the creation of bottlenecks. The form of the final tabulations and the tabulation sequence should be established. Often, where punched card machinery is used, the final tabulations are themselves in the form of the tables to be published and need only to be photo-offset for inclusion in the final publication. So planning the tabulations will expedite publication as well as eliminate the otherwise necessary task of transcribing the data. The format and content of the final publication should also be determined. Usually this would involve outlining the descriptive material and notes which will help the consumer interpret the final data presented.

^{12/} Op. cit., Vol. 1, Chapter XVI.

III. The Preparatory Work

A. Introduction

31. Like the planning steps, the preparatory work for a comprehensive survey requires relatively little in the way of staff. The quality of the work of this staff, however, will be the factor on which the success of the survey will turn. Attention to detail, here as in planning, will be crucial.

B. Preparation of Maps

32. Up-to-date maps are a very useful tool in a large-scale survey - particularly for designing surveys in which area sampling is used. They can be helpful in estimating travel and enumeration costs, in defining enumeration districts and in controlling the field enumeration staff.

33. While in most countries general maps are available, detailed and up-to-date maps of the smaller administrative areas may not be. In many countries there is attached to the statistical office a cartographic unit which, working in co-operation with appropriate agencies, prepares the detailed working maps needed. Often the statistical office itself undertakes the task of bringing certain maps up to date. This is most often true in the case of city maps which are almost indispensable for sampling purposes.

34. The collection and preparation of maps for survey work is, of course, a long-term and continuing task. The building of an adequate map library could, in fact, take several years. The entry, therefore, in the schedule of the Annex, showing the time spent on map preparation would cover only the process of minor adjustment and correction of existing maps.

C. Preparation of an Industrial Classification and Coding System

35. An industrial classification has, of course, a broad field of application outside an industrial survey, but its role in such a survey is very important. A great majority of the countries have already established an industrial classification and, in accordance with the recommendations of the Statistical Commission, a large number of these national classifications conform to, or are convertible to the International Standard Industrial Classification of All Economic Activities (ISIC).^{13/}

^{13/} Statistical Papers, Series M, No.4, Rev.1, United Nations, New York, 1958.

36. Two important factors affecting the construction of an industrial classification are (i) the organization of activities within establishments, and (ii) the degree of specialization in the activities of the usual establishment. Perhaps the most commonly observed difficulty encountered in using certain classifications has been a result of attempting too detailed a classification. Unless specifically warranted by the characteristics of the usual establishment, little can be gained by adopting a very detailed system. It is suggested, therefore, that the adaptation of the ISIC for national use be based on an investigation of the common organizational pattern of industrial activities.

D. Preparation of a Commodity Classification and Coding System

37. One of the most important pieces of information usually required from a basic industrial inquiry is the value and quantity of important commodities produced by the various establishments. Few sections of the usual questionnaire, however, have given more difficulty at the enumeration stage and particularly at the processing and tabulation stages, than has this. At the enumeration stage the difficulties arise primarily as a result of confusion on the part of the respondent regarding the meaning of "commodity". Is he, for example, to report separately, if a textile manufacturer, for each grade of cotton fabric produced, or all fabrics together? And the difficulty is compounded when each such manufacturer reaches a different conclusion about the degree of detail wanted. Confusion of this kind is especially evident when schedules are not tailored to each industry and the establishment is simply asked to list its major products.

38. At the processing stage, of course, where it is necessary to convert the detailed product data into consistent numerical codes, all of the confusion and inconsistency of the respondents becomes evident. Further, where the respondents have been asked only to list their products without the help of a reference list, it will often be found that several names are used for what is essentially the same product and not infrequently very similar names can relate to quite different things. Clearly, this state of affairs can only result in multiplying the work of processing many fold and, indeed, can lead to final commodity production figures that are somewhat questionable. Particularly when it is considered that a comprehensive inquiry can easily include 10,000 establishments (a great deal more in many countries) and that the average number

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of products reported by each establishment can be twenty or more, it is not hard to envisage the magnitude of the processing operation and the importance of forestalling these difficulties before they arise. Of course, where details on commodities consumed or purchased are requested, the dimensions of this problem are approximately doubled.

39. While it is virtually impossible, particularly in an early inquiry, to foresee all the difficulties that will be encountered in connexion with the collection and compilation of commodity data, the construction of a commodity classification and coding system and the study of the more important industry groups to determine their main products can take one far in the right direction. As a foundation for such a classification and coding system an international trade classification such as the SITC^{14/} has been used in a number of countries.^{15/} It must be recognized, of course, that a trade classification, concerned with those commodities important in the import and export trade, will have to be modified to take into account the products and raw materials important to the industry of the country in question.

40. As a concurrent operation, efforts should be made to develop, for each industry group, a list of important products and, perhaps, raw materials. In many cases, of course, the statistical office personnel will not have the technical knowledge necessary for this work. The Indexes to the International Standard Industrial Classification of All Economic Activities,^{16/} however, provides a list of many of the important products of each industry group and where this can be augmented by consultations with trade associations and with people engaged in the industries concerned, quite adequate lists can be devised with a relatively small investment of time and labour. These lists can then be used in laying out precoded questionnaires for each industry.

^{14/} Commodity Indexes for the Standard International Trade Classification, Statistical Papers, Series M, No. 10, Indexed Edition.

^{15/} In Latin America use has also been made of the Nomenclatura Arancelaria Uniforme Centroamericana (NAUCA) y su Manual de Codificación, E/CN.12/420, which is a more detailed version of the SITC adapted to the external trade requirements of the Central American countries.

^{16/} Statistical Papers, Series M, No. 4, Add.1, United Nations, New York, 1952. A revision of these indexes is now in process and will soon be available.

E. Preparation of the Industrial Directory

41. In many cases no one agency maintains records on units engaged in the whole field of industry. One agency, for example, may be concerned with mining, another with manufacturing or construction. Further, the field of activity of these agencies may overlap somewhat and the same establishment or enterprise be found in the files of two or more agencies. Therefore, before these lists can be used to send out canvass forms to gather the required directory information, the lists must be collated and the duplications removed. Quite often this is a tedious work, complicated by the fact that one not infrequently finds that the same establishment or enterprise can be known by different names.

42. More serious than the problem of duplications among several sources is the problem that arises when a segment of industry is not covered by any agency. In some cases, this deficiency can be at least partially rectified by going to trade or other private associations, but failing this source, it would usually be necessary to resort to some sort of field canvass to locate and identify units operating in the excluded segment.^{17/}

43. After the collation of the lists has been completed, brief questionnaires, designed to elicit the few items of data needed for the directory, must be mailed out. These questionnaires will subsequently be processed and coded and the information transferred to punched cards and plates or stencils or to whatever other media have been decided on for the directory.

F. Publicity

44. A properly executed publicity campaign can do much to educate the general public and the prospective respondents in the importance and purpose of an industrial inquiry. Perhaps more importantly it can, if well conceived, lower the respondents' resistance, invariably encountered, to divulging the kinds of facts and figures to be requested. To accomplish these aims the publicity should emphasize the possible usefulness of the survey results to industry itself and the confidentiality of individual returns quite as much as the national aspects of the survey in terms of a framework for the development of government policy.

^{17/} See para. 13 above.

45. The earlier phases of a publicity campaign often consist of personal contact between the statistical authorities and trade associations, meetings with the leaders of industry and the like. Such personal contacts can serve a dual purpose in that the views and comments of industry people concerning the objectives of the survey can be sought at the same time. In fact, at each step where it has been suggested that direct contact be made with industry personnel, the industrial survey is publicized - in designing the questionnaire, in preparing a commodity classification, etc. One extremely useful technique used by the United Kingdom to prepare respondents for an impending survey is the distribution of specimen questionnaires to all respondents one year before the survey proper takes place. Respondents can then prepare their records for the year with a knowledge that they will be required to provide certain information.

G. Personal Visits to All Very Large Units and a Few Medium and Small Units.

46. In virtually every country there are a few very large companies in each industry group which, in terms of production, employment, etc., account for a large proportion of the activity in that industry. From the point of view of the statistician this situation offers an opportunity to improve significantly the chances of running a successful survey with the expenditure of relatively little time and effort. Advantage has been taken of this opportunity in a number of countries, and programmes organized to send relatively senior members of the statistical office on personal visit to each of these very large companies to discuss in some detail the impending survey.

47. Among the gains to be counted as a result of establishing direct contact with the very large firms are the following: (i) the co-operation of these companies can be enlisted by explaining the general purposes of the survey and the usefulness of the final results to the company itself; (ii) the questionnaire can be discussed and explained to the persons who will be responsible for completing it, thus enhancing the possibility that complete and accurate data will be forthcoming; (iii) the comments and questions of the prospective respondents will help in formulating the questions and instructions more clearly; and (iv) the statistical office will acquire a most useful insight into the general record keeping practices of the large firms and the problems and difficulties attendant on replying to a statistical questionnaire. From the

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foregoing it is apparent that the programme of personal visits can be considered as a process of mutual education and one which will be of particular value to continuing work in this field.

48. The characteristics and problems of the very large firms may, of course, differ markedly from those of the medium and small units. With this in view, it is suggested that personal visits also be made to a number of these establishments in order to make sure that the questionnaires and instructions will be understandable and applicable to their particular condition. In this connexion, it is well to bear in mind that while individually less important than the very large units, the number of medium and small units to be enumerated will be large. For this reason, any difficulties that develop in regard to their enumeration can seriously impede the whole progress of the survey. It is important, therefore, to ascertain and take account of any general peculiarities of these units beforehand.

49. What is considered a "very large firm" will, of course, vary from one country to another and the definition will depend in large part on the number of persons available to do the visiting. These visits can, however, be distributed over a period of several months, and it is probable that four men could easily handle two hundred units in the period of seven months allotted to this work in the suggested schedule set out in the Annex.

H. Preparation of Schedules for Mailing or Delivery to the Large Units

50. Whether enumeration of the large units (those included in the directory) is to be carried out through the mails or by means of a directed field inquiry, schedules should be prepared for each establishment in advance. This work would involve: (i) addressing each schedule; (ii) precoding of identification and location and industry; (iii) including the appropriate precoded product list for each establishment; and (iv) grouping together establishments belonging to the same company or enterprise for transmittal to the head office of the enterprise. All of the information for the foregoing operations would, of course, come from the directory files and where mechanical equipment is available for automatically handling the addressing and precoding, this operation can be very rapid.

I. Recruitment and Training of Field Staff

51. The careful training of field enumerators is essential to the success of the industrial survey. They must be instructed in all aspects of the operation,

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including not only the objectives of the survey and the concepts involved in the questionnaires, but also in the mechanics of doing their work. There will be control and report forms to maintain. Each man must understand the administrative chain of communication and know to whom and where he must go for needed assistance and direction while in the field. Usually it will be necessary to train the enumerators in interviewing techniques as well as to instruct them regarding the legal responsibilities of respondents to answer their questions. They must understand how to read the maps which will outline their assigned areas and how to canvass an area in search of industrial establishments.

52. Whether the enumerators are recruited and trained centrally or in each region of the country will depend on several factors - among the more important being the geographic size of the country, the number of enumerators required and the relative magnitude of salaries and travel costs. From many points of view, of course, it is more satisfactory to train the enumerators centrally. In this way greater control of the training programme can be maintained. This will be practicable, however, only where the number of enumerators is not too great. The advantages of centralized training and control, nonetheless, are among the more cogent reasons for designing the survey to require as few enumerators as is consistent with adequately covering the inquiry field within a reasonable period of time.

53. If there are a large number of enumerators or there is not a sufficient number of persons within the statistical office to take care of the work, field supervisors and crew leaders must be trained. In most cases these men should be given a somewhat longer period of training and should be trained centrally.^{18/} Their task will be not only to direct and organize the work of a team of enumerators, but also to do the preliminary editing of schedules to ensure that gross errors or omissions are corrected before the schedules are returned to the central office.

54. Frequently a small pilot survey can be organized as part of the enumerators' training programme. Where this can be done it not only serves as a training device, but also provides a valuable testing ground for the organizational and administrative apparatus. Even though it is not possible to organize a pilot

^{18/} In some countries the crew leaders have been chosen from among the more promising trainees in the regular enumerator training programme. /...

survey it is important to schedule some concrete operational work for the enumerators both as a training element and to check the adequacy of the class-room instruction.

J. Recruitment and Training of Temporary Office Staff.

55. The training of the temporary staff that will generally be required to process the completed schedules should be thorough. In addition to the instruction of each clerk regarding the section of the schedule which will be his special province, all should be instructed in the objectives of the survey and the reasons for the coding and processing so that the essential nature of the work is understood. Needless to say all the clerks should be familiar with the classification systems they are to use and the computations that must be performed.

56. While in a sense, there can be closer supervision of the office staff than of the enumerators, the number of errors that can be introduced at the processing stage is often surprising. With this in view, careful organization of the training programme and insistence on attention to details is essential. It should be noted that supervision and control can be improved if it is possible to start with a core of experienced personnel who could be assigned key spots in the operation.

57. As in the training of the field staff, making a pilot run, or a short period of actual work, a part of the training can be effective. If there has been a pilot survey carried out by the field staff, their schedules can be used for this phase of training.

IV. Execution

58. No matter how carefully planned and prepared for, the enumeration period of a survey is one of intense activity. A myriad of details all seem to demand immediate attention, and once in the field, events tend to move too rapidly for more than minor adjustments to be made to the survey machinery. But if the planning has been well done and the preparatory steps carefully executed, no more than minor adjustments should be necessary.

59. In order to keep the field operation under control, regular progress reports must be submitted to the centre. Through these remedial action can be started quickly in the face of any difficulties or unexpected slow downs.

60. It is also very important to insist that crew leaders and supervisors edit the completed schedules with care and spot check the field work of enumerators. They will, of course, have been trained in the techniques of this editing and spot checking and their close attention to these tasks can contribute significantly to the accuracy of the final results and to keeping the cost of later call backs to a minimum.

61. It will be noted that in the survey schedule of the Annex the enumeration stage is divided into two periods. The first of these periods is devoted to enumeration of the large establishments; the second, following two weeks after the first, is devoted to the field canvass to find, identify and enumerate a sample of the small establishments and to check the completeness of the list of large establishments in the sample areas. This technique is suggested as a means of minimizing the size of the field staff needed and to separate the enumeration phase into two parts that are rather different in character and pose somewhat different problems.

62. The ease with which the processing phase of the survey is accomplished will depend, of course, on the adequacy of the planning and preparatory work as well as on the training given the clerks and the quality of the data reported. All too often it is not until the processing stage that the errors committed during earlier phases of the work come to light. In some cases these errors, if minor, can be corrected, but not infrequently it has been found that some data collected could not be tabulated. Most often this contingency arises from

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a lack of clarity in one or another of the questions that can lead to large inconsistencies in the reporting - many times caused by an attempt to gather too detailed information.

63. As in the field work, constant attention to the quality of work is essential. Spot checks should be made frequently at all stages from initial office editing to tabulating, and progress records should be maintained.

V. Conclusion

64. In the foregoing sections an attempt has been made to outline briefly the importance of careful planning and execution of a large-scale industrial survey. Brevity in describing the operation of such a survey, however, necessarily entails the omission of many relatively important points. And often it is the step forgotten or carelessly done that seems, in the final analysis, to have been a most important element. It has been the limited objective of this paper, therefore, to describe key steps of the survey in sufficient detail to indicate the magnitude of the work involved and the importance of treating all the necessary steps with equal care.

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ANNEX

OUTLINE SCHEDULE FOR AN INDUSTRIAL SURVEY RELATED TO 1963

1. In order to prepare the attached schedule, it was necessary to make certain assumptions regarding conditions in the hypothetical country for which the schedule is intended. The assumptions made are as follows:

(a) The decision has been made to undertake a comprehensive industrial survey, the broad outlines of the survey have been determined, and the necessary funds for such a project are considered likely to be available.

(b) The survey is to be the first comprehensive industrial inquiry, or at least the country is assumed to have had limited experience in such surveys.

(c) An adequate directory of the large industrial establishments (those employing ten or more persons) does not exist, but there do exist administrative records which can provide at least names and addresses of such units.

(d) The mails are reliable and can be used for the distribution of the questionnaires to the large units, but respondents' lack of experience with statistical reporting makes it advisable to use field enumerators to collect and check the schedules. It should be noted that, where a full mail inquiry could be used, recruitment and training of the enumerators could be postponed by approximately one month.

(e) The objectives of the survey in terms of coverage will be met by complete enumeration of the large units (here assumed to be those employing ten or more persons) and enumeration of a relatively small sample of the small establishments which do not appear in the industrial directory.

