

UNITED NATIONS

ECONOMIC  
AND  
SOCIAL COUNCIL



COMMISSION OF  
LATIN AMERICA



GENERAL C. 2

E/CN.12/561  
14 February 1961

ORIGINAL: ENGLISH

ECONOMIC COMMISSION FOR LATIN AMERICA  
Ninth Session  
Caracas, May 1961

SEMINAR ON INDUSTRIAL STATISTICS: SUMMARY OF  
PROCEEDINGS AND CONCLUSIONS

With a note by the secretariat



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NOTE BY THE SECRETARIAT

In accordance with ECLA Resolution 154 (VIII), paragraph 3, a Seminar on Industrial Statistics, jointly sponsored by the Economic Commission for Latin America, the Statistical Office of the United Nations, the Inter-American Statistical Institute, and the United Nations Bureau of Technical Assistance Operations, was held in Santiago, Chile, from 10 to 28 October 1960. The Government of Chile acted as host.

Representatives from all member States of ECLA and from the two associate member States were invited. The participants are listed in annex I.

The purpose of the Seminar was to provide an opportunity for the exchange of views on objectives, methods and programmes in the field of industrial statistics, both for periodic censuses and for more frequent current inquiries, and in the preparation of indexes of industrial production.

The summary of discussions and conclusions reached is presented herewith. This report only contains the substance of the results of the meeting. The complete report will appear in print in the near future and will include the papers discussed at the Seminar and other related material.

In view of the importance of this Seminar so far as achieving uniformity in Latin American industrial statistics is concerned, the secretariat considers that this report will be of interest to delegations attending the Commission's ninth session and is duly transmitting it to member Governments in advance of the session.



## SUMMARY OF DISCUSSIONS AND CONCLUSIONS REACHED

## I. PLANNING AND PROGRAMMING OF INDUSTRIAL INQUIRIES

1. The first subject considered by the Seminar was the planning and programming of industrial inquiries, based on a paper, ST/STAT/CONF.8/L.1, in which the sequence of steps in planning, preparing for and carrying out each type of inquiry (i.e., benchmark, annual and monthly or quarterly) was delineated, and the time, personnel and other resources required for each of these steps were discussed.
2. The Group emphasized the critical importance in planning each type of inquiry, of considering, in detail, and reaching realistic conclusions on:
  - (i) the objectives and content of the proposed inquiry (e.g., the techniques, questionnaires and other forms, instructions and procedures to be utilized);
  - (ii) the personnel and other resources required to carry out the inquiry;
  - (iii) the organization of the staff and the work involved in each step of the inquiry; and
  - (iv) the cost of each phase of preparing and carrying out the inquiry.Only by considering these essential points well in advance of the survey could it be ensured that the personnel, equipment and money required for the inquiry would be available and that the personnel would be adequately trained. Detailed early planning was also essential if the survey was to be realistic in the light of the available records of the industrial units to be enumerated and the statistical and other resources that could be mobilized. Further, unless each phase of the survey was planned in relation to all the other phases, there was a real danger that the procedures and forms devised for different phases would not be consistent or co-ordinated with one another. For example, the content and lay-out of the questionnaire would greatly influence both the methods adopted for editing, coding and card-punching and the ease with which these operations could be carried out. Again, the design of the punch-cards would determine the methods and costs of tabulation as well as the practicability of making many of the tabulations. Countries were, therefore, devoting increasing attention to the detailed and co-ordinated planning of each phase of their industrial inquiries, especially with regard to the earlier steps, such as

/the industrial

the industrial directory and questionnaire, in relation to the later phases of work, such as the compilation and publication of the data gathered.

3. The Seminar agreed that the time required for planning and preparing for an industrial inquiry would depend on: (i) the nature and scope of the inquiry (e.g., whether it was a comprehensive census or a less detailed annual survey or whether it involved field work or was based solely on an industrial directory); (ii) the number and frequency of similar inquiries in the past; and (iii) the extent to which the experience, personnel and organization of earlier surveys could be utilized in planning the new or revised inquiry. One important advantage of a programme of industrial statistics consisting of an integrated system of benchmark, annual and monthly (or quarterly) surveys was that it helped maintain a continuous organization and that trained personnel, equipment and experience were accumulated for planning and carrying out each of the inquiries. In any event, the Group felt that it was essential to have trained and experienced technical and administrative staff for planning and preparing benchmark, annual and more frequent inquiries and for training and supervising the new or additional personnel that might be required to carry out these surveys.

4. It was noted that the schedules of time presented in Annexes I and II of the document, ST/STAT/CONF.8/L.1, for planning, preparing and carrying out the various steps of comprehensive and annual inquiries were primarily intended to suggest the sequence and timing of each of these steps relative to one another. These schedules of time were designed to reflect the average situation in Latin American countries. This also applied to the discussion in the text of the paper of the personnel and costs involved in each of the major phases of planning and preparing for benchmark and annual inquiries. Some members of the Group noted that, in practice, the time available for planning and preparing an inquiry was often too short, and, hence, that it was desirable to make an ample estimate of the time required for these purposes.

5. The Group felt that the following were important in planning new or revised industrial inquiries: (i) consultations with governmental and private organizations that would utilize the data from the inquiry;

/(ii) detailed

(ii) detailed discussions with the industrialists who would supply the data; and (iii) evaluation of the industrial statistics already being gathered in the light of the requirements for industrial data and the problems encountered in collecting and compiling these data. For the first and third of these purposes, a number of countries had found standing or ad hoc statistical co-ordinating or consultative committees very useful. For the second of these purposes, discussions with trade associations, visits to different types and sizes of industrial units, and testing proposed questionnaires and instructions on a sample of the establishments to be covered would be valuable.

6. The Seminar emphasized the importance of a good industrial directory in preparing for and carrying out any kind of industrial inquiry. A good directory would provide the basis for gathering information from at least all the kinds of establishments that it was feasible to include in it. The amount of time and work involved in preparing an adequate industrial directory depended on (i) the range of establishments to be covered and (ii) the availability, either from earlier inquiries or administrative records, of up-to-date lists of the names and addresses of all units to be included. Where it was possible to maintain a good directory of the larger industrial units to be covered in an annual inquiry, the time required for preparing for either annual or benchmark inquiries was very substantially reduced. The Group felt that in order to establish and maintain a useful industrial directory, as well as to ensure the carrying over of experience from earlier to succeeding inquiries, it was necessary to devote a permanent part of a government statistical organization to industrial statistics.

7. The Group also recognized the importance of good maps to any industrial inquiry that involved area sampling or the use of field enumerators. Many countries had accumulated, in connexion with their population and agricultural censuses, a library of very useful maps for this purpose. Other essential preparatory steps for a benchmark inquiry were (i) the development or revision of basic systems of classification (e.g., industrial, geographic and size classifications and the classification of products and raw materials) and (ii) publicity.

/II. PURPOSES,

## II. PURPOSES, FIELD OF COVERAGE AND CONCEPTS OF THE VARIOUS INQUIRIES IN A SYSTEM OF INDUSTRIAL STATISTICS

8. The discussions of the Seminar of the purposes, field of coverage and frequency of the various types of industrial inquiries and the statistical units to be used and the items of data to be included in each of these surveys were based on the document, ST/STAT/CONF.8/L.2. It was considered essential to view each type of individual inquiry as part of a system of industrial statistics designed to meet the requirements for industrial statistics in the most realistic and efficient manner. For this purpose, the various types of inquiries had to complement and mesh with one another. Benchmark censuses furnished information for designing annual and monthly or quarterly surveys. The less frequent but more comprehensive inquiries also provided data for making or improving estimates from the more frequent but less comprehensive surveys - for example, benchmark censuses in relation to annual inquiries or annual inquiries in relation to monthly or quarterly surveys. Also, annual inquiries were means of extrapolating benchmark censuses; and monthly or quarterly surveys played the same role with respect to annual inquiries. Further, it was necessary to differentiate between the various types of inquiries with regard to which of the required industrial data were best sought in each. For example, one of the special functions of a benchmark census was to provide data on the structure of the industrial sector and the characteristics of each part of this sector. Or, it was more convenient to gather selected difficult data that were desired at infrequent intervals in an annual survey, which was limited in the number of respondents, than in a benchmark census, which involved gathering many more questionnaires with a much larger and less experienced staff. The Group also felt that in defining the coverage, frequency and scope of the various types of inquiries, it was essential to weigh the requirements for data against the practicabilities and costs of gathering these data.

### A. Field of Coverage, Frequency and Period of Reference

#### a. Comprehensive infrequent inquiries

9. Since the benchmark inquiry was designed to furnish a description of the industrial sector and an inventory of the resources and activities of this sector, it was agreed that, in principle, the benchmark inquiry should relate to all mining, manufacturing, construction and electricity

/and gas

and gas producing units. This did not mean, however, that data had to be gathered directly from all of these units. Effective use might be made in some countries, for example, of administrative records to obtain data for the electricity or gas producing industries or of samples to gather data for small establishments. Nevertheless, because of the difficult and special problems involved in collecting data on certain parts of the industrial sector - for example, the relatively small units and the construction industry - countries would not always find it feasible to cover these units.

10. Generally speaking, it had not been possible to compile usable lists of all the smaller industrial units (e.g., those engaging less than 5 or 10 persons) to be covered in a benchmark inquiry from records that were a by-product of administrative activities, and it had been necessary to engage in costly and time-consuming field canvassing for this purpose. Population censuses could provide a means of constructing suitable lists of smaller units, and some countries were making use of, or experimenting with, this approach in the present round of population censuses. The collection of data from smaller industrial units was also difficult and expensive, even when the items of data sought from them were restricted to the simpler statistics and sampling was utilized. In view of the resources and time required to cover the very small units and of the relatively minor contribution of the units to the output and other activities of the industrial sector, a number of countries would not find it practicable to include all small industrial units in their next round of benchmark inquiries. This was particularly the case for countries which had had relatively limited experience in taking industrial inquiries.

11. Only a few American countries had attempted to cover the construction industry in their benchmark inquiries and, of these, two did not feel that their attempts had been successful. Establishing complete lists of the construction enterprises and handicraft units engaged in business during a year was very difficult. Licenses issued for construction projects, information obtained from prime contractors and important sub-contractors,

/contracts awarded

contracts awarded by governmental and other authorities, and tax and other governmental records had been utilized for this purpose. A population census would also be a valuable source of lists of construction units, especially for craftsmen. However, the turnover in construction units was greater than for other types of industrial units and the lists became out of date relatively quickly. Further, gathering data for the construction industry was complicated by the practice of extensive sub-contracting. And covering the construction industry would not result in complete data on construction activities because of the frequency of own-account construction by public utilities and mining, manufacturing and other units. It was noted in this connexion that provision was made, in the programme under discussion, for the collection from industrial units of data on own-account construction. In view of problems such as those mentioned above, the Group emphasized the need for experimenting with and accumulating and sharing experience on the collection of data on the construction industry and construction activities.

12. The Group was of the opinion that, because of the rapid changes that were taking place in Latin America in the structure and activities of the industrial sector, it was necessary to take benchmark inquiries at least once every five years. If a benchmark census was part of a system of industrial statistics including well-developed annual surveys, the census could be limited to the gathering of the simpler data on the structure and resources of industrial units. Otherwise, the full range of required data on the structure, resources and activities of industrial units would need to be dealt with in the benchmark inquiry. It was noted that, in some countries, it would be practicable to cover the entirety or almost all of, the industrial sector in the comprehensive censuses spaced at ten-year intervals but not in an industrial inquiry taken midway between these two benchmark inquiries.

b. Annual inquiries

13. The consensus of the Seminar was that the field of coverage of annual surveys should be limited to the industrial units for which an adequate industrial directory could be maintained. As, in a number of countries, an adequate industrial directory could be maintained for the larger units only (e.g., for those engaging 5 or 10 persons or more), this

/meant limiting

meant limiting the field of coverage of annual surveys to these units. To be practicable, the cost of taking an annual survey had to be kept well below that of a benchmark inquiry and, to be useful, the results of an annual inquiry would need to be issued well before the next annual survey was started. Limiting the annual inquiry to the larger industrial units would, in general, make this possible. Furthermore, the larger units accounted for the bulk of the activities which the annual survey was designed to measure. However, in some countries, the smaller industrial units (e.g., those engaging less than 5 or 10 persons) account for a significant portion of activity, especially in certain industries. In these circumstances, it would be desirable to include the smaller industrial units in the field of coverage of the annual survey by the use of sampling, particularly if, as was indicated in the case of some countries, it was feasible to maintain an adequate industrial directory for at least part of the smaller units. Otherwise, area samples would have to be resorted to for the smaller industrial units.

14. The Seminar noted that a number of countries were engaged in developing or revising their annual surveys and that some were using the sampling approach in the taking of annual surveys. It was also observed that the problems of covering the construction industry in annual surveys were similar in many respects to those encountered in benchmark censuses.

c. Reference period of annual and less frequent inquiries

15. In general, the Latin American countries had found it desirable and practical to use the calendar year as the reference period for annual and less frequent inquiries. Only two countries of the area had made general use of an accounting year that differed from the calendar year. However, other countries had permitted individual establishments to report in respect of their accounting year when this differed from the calendar year. It has been found unnecessary, in these instances, to adjust, to the calendar year, data reported for accounting years that differed from the calendar year.

/d. Monthly

d. Monthly or quarterly inquiries

16. There was general agreement among the members of the Seminar that the work of the statistical organization and respondents in each monthly or quarterly survey had to be strictly limited. To be useful, the results of monthly or quarterly surveys had to be issued promptly. This could be accomplished only if: (i) few items of data were sought in these surveys; (ii) the respondents were limited in number and consisted of those who could be expected to supply figures promptly for these items of data; and (iii) the work of gathering and compiling these figures was restricted to the staff and other resources that could be made available. For these reasons a number of countries restricted the field covered in monthly or quarterly surveys to large industrial units and sought, in these inquiries, the most essential current statistics only - often, data on the quantity and/or value of output for specified commodities or classes of commodities and for electricity and on employment, wages and salaries paid and man-hours. Other countries had limited the number of respondents involved in their monthly or quarterly surveys by the use of samples.

17. In the case of individual commodities, it was usually possible to gather data on a large part of production by covering a very small number of the larger establishments. This, however, was not as often the case for data on labour.

18. For industries engaged in the production of a wide range of commodities or of highly-fabricated goods, data on the output of specified commodities, or even classes of commodities, did not provide a suitable measure of the volume of activity; and, for this purpose, some countries had resorted to the use of current data on either labour (e.g., man-hours worked or numbers employed) or specified raw materials consumed (e.g., quantity and/or value).

19. Because of the complexities of gathering current data on inventories or on expenditures for fixed assets, only one country collected such current data.

20. Several members of the Group mentioned the lack of adequate monthly or quarterly data in their countries on the value and volume of construction activity. Although statistics were abstracted from licenses granted for construction projects (often only for residential buildings in urban areas), the reliability and completeness of coverage of these data were

/questionable. Construction

questionable. Construction work was also carried on without licenses; construction projects for which licenses were granted were sometimes not started or abandoned before completion; the figures relating to value and other aspects of construction projects reported in the licenses were of questionable accuracy. These members felt that, at best, licenses could be a source of identifying information on construction projects and firms from which the urgently needed data would need to be gathered directly, although almost no country had thus far been in a position to do this. On the other hand, some members of the Group stated that, in their country, although the licensing of construction projects did not provide all of the desired data concerning the value and volume of construction activity (e.g., work in progress), it did furnish rather complete and reliable information on construction starts and, in one case, completions. Careful administration of the licensing activity and inspection of projects for which licenses were granted considerably improved the quality of the data available from the licensing of construction projects.

21. Although the Group felt that it was possible, on the whole, to gather the specific current data that were required for the mining, manufacturing and electricity industries, it discussed the usefulness of global and easily gathered indicators of changes in the volume of industrial activity, such as the production and consumption of electricity. A number of participants suggested that the correlations between such indicators and the volume of industrial activity might be distorted by structural changes or unusual current events and that, in any case, figures on the output of specific commodities or on employment in specific industries were wanted for many purposes other than gauging the trends in economic activity as a whole. Therefore, the aim should be to develop direct measures of at least the output and employment of the mining, manufacturing, construction and electricity industries. Nevertheless, in the absence of such statistics, easily gathered data on broad indicators of the volume of industrial activity would be of value in economic analysis.

/B. The

B. The Statistical Unit

22. In all American countries, the establishment was, in principle, used as the statistical and tabulating unit. In a number of countries, however, the legal entity was considered to be the only possible statistical unit for the mining, construction and electricity industries.

23. The Group devoted considerable attention to the problem of subdividing the multi-activity and/or multi-location enterprise into a set of establishments, each of which engaged in a reasonably homogeneous collection of activities at a single location. That had been an important problem for many countries because, not infrequently, records were seemingly not available within large multi-activity and/or multi-location enterprises that allowed the respondent to provide a broad range of data for each of his main lines of activity in which and/or for each location at which the enterprise operated. Particularly excessive difficulties were encountered in attempting such subdivisions due to the absence of records that enabled the allocation of selected overhead costs among the units for which separate data were wanted or the appropriate valuation of goods that flowed between these units. A solution to this problem was felt to be vital because of the effect that the statistical units used in practice had on the precision of classification of data according to kind of industrial activity, size, geographic area, etc. and, hence, on the possibilities of subsequent economic analysis. It was pointed out, for example, that the acceptance of statistical units that combined, with manufacturing, significant amounts of agricultural or mining activities were apt to obscure the increase in the importance of manufacturing relative to the primary industries that took place as economic development proceeded.

24. Because of the relatively small number of large multi-activity and/or multi-location enterprises, some members of the Seminar suggested that direct negotiation with these units was the best way of obtaining individual reports for their separate activities and/or places of business. In such negotiations the three-digit groups of the International Standard Industrial Classification (ISIC), or their equivalent in the national classification, might be utilized as a guide to each set of activities for which a separate

/report was

report was desired. In other words, whenever the enterprise in question carried on, at the same location, activities that fell into two or more three-digit ISIC groups, a means might be sought for obtaining all, or most, of the required data separately for each of the important groups of activities. It was also suggested that the sub-division of the multi-activity and/or multi-location enterprises into constituent establishments would be facilitated by the use of special statistical units for reporting on the office staff and the other ancillary facilities and services shared by each of these establishments.

C. Statistics To Be Compiled And Items Of Data To Be Gathered In Various Types Of Inquiries

25. The Seminar discussed the difficulties of reconciling the requirements for information with the resources available for carrying out industrial inquiries, and stressed the need to take into account the extent to which satisfactory records were kept by respondents.

26. Attention was called to the necessity of differentiating between the statistics that should be obtained from large and from small establishments. It was also emphasized that in designing the various inquiries (five-year census, annual inquiries or monthly or quarterly surveys), priorities should be assigned to the collection of the various items of data desired based on the degree to which the information concerned was essential, the difficulties which would be encountered in gathering it, and the costs of compilation.

a. Characteristics of the statistical unit

27. As regards the characteristics of the statistical unit, the Seminar recognized the value of obtaining data on location, kind of activity, size, and kinds of legal and economic organization. This information was essential to the classification of data according to each of these characteristics in order to describe the character and structure of the industrial sector of the economy and to evaluate the relative performance, efficiency and trends in the activity of the various parts of this sector. Information on the characteristics of the statistical unit was also

/required in

required in determining which units fell within the scope of an industrial inquiry, designing sample surveys and in other statistical operations. However, information on the full range of characteristics was needed during benchmark inquiries only. In annual inquiries, it would be sufficient to gather information on the kind of activity and location of statistical units; and in monthly or quarterly surveys, it would not be necessary to gather information on the kind of activity of statistical units.

28. The Seminar stressed the necessity, for the sake of international comparability, of using the ISIC, or a system convertible to the ISIC, in classifying statistical units and the data compiled for them according to kind of economic activity. However, in the case of other characteristics of the statistical unit such as location or organization, it was emphasized that the scheme of classification would depend primarily on the administrative and legislative arrangements of each country. Tabulations of data according to geographic area and kind of legal organization were of much less interest internationally than classifications of data according to kind of industrial activity. Also, the sub-divisions of a country that were significant and could be effected and the types of legal organization that were prevalent and could be distinguished varied from country to country, depending on administrative and legal arrangements.

b. Employment and salaries and wages paid

29. The Group noted that the practices of American countries with regard to the gathering of items of data, in benchmark censuses or annual inquiries, on employment and wages and salaries paid were basically the same as the international recommendations on this subject.

30. The Seminar felt that it was desirable that each country gather, if feasible, data on the functional status of personnel. It was recognized that difficulties had been, and would be, encountered in sub-dividing employees into operatives and other employees. However, these difficulties would be lessened by restricting the gathering of separate data on operatives and other employees to the larger establishments. Moreover, it was primarily for these establishments that data were needed on the employment of operatives,

/the employment

the employment of other employees, and the man-hours worked by operatives.

31. The Group devoted considerable attention to the treatment of homeworkers. As a result of this discussion, it was agreed that the inclusion of homeworkers in the count of the number of engaged and in the figures of wages and salaries paid should be optional. Countries with legislation or national circumstances that enabled them to define the number of homeworkers clearly and without duplication could, of course, seek such information. If data on the employment of homeworkers and payments to them were sought as part of the data on labour, for purposes of international comparability, as well as other reasons, these figures should be presented separately from data on the employment of and wages and salaries paid to employees.

32. The Group noted the importance of having statistics on the number of man-hours worked by operatives for purposes such as measuring the amount of employment afforded more precisely than through figures of number of operatives or compiling data on labour productivity. However, difficulties had been, and would continue to be, encountered in gathering these data because of the absence of records from which data on man-hours worked by operatives could be abstracted without considerable work. This was even the case for a number of larger industrial establishments, although the obstacles to the successful collection of figures of man-hours worked by operatives would be materially reduced where these data were not sought for the small industrial units. In view of the needs for figures of man-hours worked by operatives, the Seminar suggested that, in well-developed systems of industrial statistics, efforts should be made to gather figures of man-hours spent at work by operatives in the larger establishments. In the case of annual and less frequent inquiries, some of the problems of gathering these figures might be resolved by giving large establishments the option of reporting man-hours worked by operatives during several short periods of time in the year when they found it inconvenient to report these data for the year as a whole. From data on man-hours worked during several short periods of time and on number of operatives employed during the same periods, the statistical authority could make estimates of man-hours worked during the year. The Group agreed that, in any case, data on man-hours worked should not be sought for small establishments.

/33. There

33. There was a consensus in the Seminar on the need for and practicability of gathering the data on wages and salaries paid to employees included in the international recommendations. It was also suggested that in annual and less frequent inquiries, it might be useful to seek, for the larger establishments, data on wages and salaries paid to operatives and other employees during the same several short periods of time for which figures of employment were sought for each of these functional groups. These figures would provide the basis for computing more useful figures of average wages and salaries paid than could be derived from figures of wages and salaries paid during the year. It was noted, however, that the addition of these items of data might, in many circumstances, overburden the annual or less frequent inquiry.

34. In order to avoid endangering the success of industrial inquiries by burdening them with too many complicated items of data, the Seminar also felt that detailed data on labour, such as figures of the distribution of employees by classes of skill or occupation, should be gathered by means of special labour inquiries.

c. Capacity of power equipment

35. The Seminar gave considerable attention to the question of measuring the capacity of installed power equipment and the various purposes which such information might serve, especially as an indicator of the degree of mechanization of industry. The topics to which most of the discussion was devoted were the various kinds of power equipment for which data should be obtained and the two alternatives for calculating total capacity of installed power equipment proposed in the international recommendations. In the light of the advantages and drawbacks involved in each alternative, the Group concluded that it was preferable to calculate total capacity of installed power equipment as the sum of the installed capacity of the prime movers driving machinery other than generators and that of all electric motors, irrespective of whether the electricity used to drive the motors was purchased outside or generated in the establishment itself.

/d. Capacity

d. Capacity of machinery other than power equipment

36. The discussion centred around two main themes: the problem of collecting and tabulating data concerning the capacity of individual pieces of machinery or equipment; and the question of establishing measures of overall plant capacity. In several of the countries represented, attempts had been made to collect data on special kinds of machinery which were felt to have been successful only for certain types of specialized production equipment, sufficiently standardized so that data on selected physical characteristics of each kind of machinery would provide meaningful measures of its capacity that could be aggregated. Lorries, and spinning and other kinds of textile machinery were most frequently mentioned as examples of equipment and machinery for which this could be done. The discussion indicated that the collection of meaningful objective measures of the overall capacity of plants was extremely difficult and burdensome.

e. Fixed assets

37. Data on expenditure on fixed assets were sought both in benchmark and annual inquiries in a number of countries and had been successfully collected, at least for the larger units. It was pointed out that, generally speaking, the figures reported for an inquiry year would be on capitalized expenditures posted to fixed asset or capital accounts during the period in question. In business accounting the purchase of some pieces of equipment might be treated as a current expense though the equipment itself might more appropriately be classified as a fixed asset from the point of view of economic analysis. Also noted were the problems of valuing own-account construction and site-preparation work carried on by mining enterprises on a large scale. It was agreed, however, that not only was there little alternative to accepting figures of expenditures for fixed assets posted to the capital account of the enterprise during the reference period, but that, in general, such data provided the basis for a good measure of gross capital formation in fixed assets.

38. There was considerable demand, in a number of countries, for data on the value of the stock of fixed assets for purposes of economic analysis and programming. Two ways of valuing stocks of fixed assets seemed to have

/been tried

been tried most frequently: balance-sheet values for fixed assets or estimates by respondent enterprises of the present sales value or replacement cost of their fixed assets. Most members of the Group, referring to the inflation that had occurred in a number of Latin American countries, as well as the absence of consistent methods of evaluating depreciation, thought that there was little, if any, relation between the book values assigned by enterprises and a realistic economic valuation of the stock of fixed assets in use. Even though the re-evaluation of fixed assets had been asked for in some countries, these participants in the Seminar felt that this re-evaluation had not offset the effects of inflation. Some members of the Group also questioned the possibility of gathering reliable or meaningful figures on the sales value or replacement cost of used fixed assets. It was suggested that the most fruitful approach to valuing the stock of fixed assets might be to collect good, detailed annual capital expenditure data over a period of years. These data could then be accumulated, with due regard to changes in price levels and with the consistent application of rates of depreciation, for the purpose of obtaining an economically useful measure of the value of the stock of fixed assets.

f. Inventories

39. In some countries data on inventories had been among the most difficult items to gather, even when limited to large industrial units. This had been due to a number of factors: Respondents had found it troublesome to report figures of the total value of inventories as of dates which differed from the beginning and end of their accounting year. Respondents had also encountered difficulties in providing separate figures of the value of stocks of raw materials, fuels and related goods, work-in-process and finished goods as their summary accounts on inventories did not show such sub-divisions. Further, the collection of data on stocks had been complicated in situations where raw materials owned by one establishment were sent for processing to one or more other establishments. In view of these difficulties, some members of the Group questioned the success with

/which reliable

which reliable data on inventories could be gathered. In any case, data on the value of stocks could not generally be obtained on a monthly or quarterly basis.

40. In some other countries serious difficulties had not been encountered in gathering the suggested data on stocks as long as values recorded in the accounting records of industrial units were accepted. This practice, it was recognized, did not result in the valuing of stocks at replacement cost as of the beginning or end of the accounting period (the mode of valuation most desired for economic analysis) or even in uniformity in the mode of valuing inventories adopted by different respondents. It was suggested, however, that knowledge of the ways of valuing inventories most commonly adopted by industrial units would enable users of the data on stocks that were derived from industrial inquiries, to adjust these data to the basis of valuation that they desired.

g. Inputs and outputs of goods and services

41. In the view of one participant in the Seminar, the gathering of data on the cost of raw materials, containers, parts, etc. consumed was one of the most difficult tasks in industrial inquiries. There was often doubt as to whether or not the cost of containers, parts, supplies and similar items was included with the cost of raw materials. It was, therefore, necessary to edit the answers to this query carefully and in many cases to determine from respondents what the correct reply should be. An item on inputs which gave even greater difficulty than the foregoing was cost of repair and maintenance work done by others. This difficulty stemmed, to a considerable extent, from the lack of clear demarcation of such expenditure in accounting records.

42. It was noted that the items of data on inputs that were recommended for collection in annual and less frequent inquiries would not provide information on all the costs that were required for purposes of computing contributions to the gross or net domestic product. In particular, the recommendations did not include the collection of data on overhead costs of a non-industrial nature (e.g., expenditure on communications, transport,

/publicity, advertising

publicity, advertising and consulting services), which would need to be subtracted from value added in order to obtain the contribution to the gross domestic product. Nor did the items of data on inputs cover the gathering of data on depreciation, which was required for computing the contribution to the net domestic product.

43. Although the importance of having items of data such as those mentioned in the preceding paragraph had been recognized, the international recommendations had not included these items because of the difficulties of collecting them. Some of the items (e.g., expenditure on advertising or consulting services) were more appropriate for collection in relation to the enterprise than to the establishment. If reliable data were to be gathered on these and other required items of a similar nature (e.g., expenditure on transport or communication services), it was essential that each of these items should be specified because some of these items were considered costs in business accounting but not in national income accounting - for example, interest paid or losses on bad debts or on revaluation of stocks. Moreover, the items of expenditure of a non-industrial type which were considered costs in national income accounting were not always clearly distinguished, in the summary accounts of industrial units, from those which were not so considered. In addition, it was extremely difficult to gather consistent and economically significant data on depreciation. Nevertheless, much of the needed information on non-industrial costs and on depreciation had been successfully gathered by some countries; and, where circumstances permitted it seemed desirable to seek data on these items, preferably from a restricted sample of larger industrial units. Ratios of non-industrial costs to industrial costs might then be computed from the sample for use in conjunction with data on industrial costs gathered from a greater number of industrial units.

44. Much of the Seminar's discussion of the items of data on inputs and outputs of goods and services dealt with the importance of gathering useful and reliable data on the quantity and value of individual raw materials consumed or received and individual products produced or shipped, as well as with techniques for accomplishing this. It was felt that the successful collection of data on the quantity and value of individual commodities utilized or produced depended, to a considerable extent, on the prior

/designation of

designation of the specific commodities on which such data were wanted from each kind of industrial unit. These commodities had to be named and described so that they might be identified and reported upon by respondents. At the same time, their specification had to be precise enough to give meaning to the quantities reported. The units in which quantities were to be reported also had to be indicated for the guidance of respondents. In a number of countries, the results of earlier industrial inquiries had been effectively employed to formulate useful and realistic lists of commodities that were tailored to each kind of industrial activity. In defining industrial raw materials and products it had been possible, in the majority of cases, to be specific enough for the gathering of data on quantities. Standardization and concentration on the commodities important for each kind of industrial activity were helpful in this regard. However, it was not feasible to gather significant data on quantities for highly finished products such as heavy machinery. It was advantageous to assign, as far as possible, the same description to a commodity whether it was to be reported on as a raw material or as a product.

### III. CLASSIFICATION SYSTEMS AND TABLES FOR PUBLISHING BASIC INDUSTRIAL STATISTICS

45. The discussions of the Seminar on systems of classification for selected characteristics of industrial units, such as kind of industrial activity, size, location and on tables to be issued in annual and less frequent inquiries were based on the paper, ST/STAT/CONF.8/L.3. The Group took note of the vital importance of these aspects in planning and carrying out an industrial inquiry and in the uses which might be made of the results of such an inquiry.

#### A. System of Classification

##### a. Kind of industrial activity

46. A number of countries represented at the Seminar had worked out or revised their national schemes of classification for kind of industrial activity on the basis of the International Standard Industrial Classification of All Economic Activities (ISIC). These national classification schemes and the ISIC were, therefore, completely comparable. A few such countries  
/had found

had found the changes made in the ISIC in 1958 somewhat troublesome, though desirable, because of the resulting need for changing some categories of their national classification, which created difficulties in presenting data that were comparable over time. Although the industrial classification schemes of other countries represented at the Seminar had been worked out independently of the ISIC, they were, for all practical purposes, comparable with or convertible to the ISIC, especially at the more detailed levels of classification.

47. The Group emphasized the necessity of considering the actual combination of activities in most establishments in evolving a national system of industrial classification. Otherwise, the significance and usefulness of the data classified according to kind of industrial activity would be materially reduced and the difficulties of gathering data from respondents and coding these units according to kind of industrial activity would be greatly enhanced.

48. An effective way of assuring that the most detailed categories of an industrial classification corresponded to the actual distribution of activities among establishments was to seek, from industrial inquiries, answers to two types of queries: (i) What proportion of the output of establishments coded to each category of the classification was accounted for by products or services defined under that category (i.e., a measure of the degree of specialization of these establishments); and (ii) What proportion of the output of goods and services defined under each category of the classification was accounted for by establishments coded to that category (i.e., a measure of the degree of dispersion of these activities among establishments). To be useful and realistic, each category of the industrial classification should be characterized by relatively high degrees of specialization for the establishments coded to the category and by relatively low degrees of dispersion for the products and/or services defined to the category.

b. Size

49. The Group felt that although the average number of persons engaged was the most satisfactory measure of the size of industrial units for international comparisons and for a number of national uses, additional

/measures might

measures might be required for national purposes. Gross value of output and/or capacity of installed power equipment had, for example, been utilized as supplementary measures of size. Value added should also be given consideration. The Group agreed that it was practicable to use classes of size, in terms of the average number of persons engaged, that would be consistent with the minimum number of internationally recommended classes of size, which were defined in terms of the lower limits to be employed in each class. A number of countries would require more sub-divisions for the smaller or larger industrial units.

c. Geographic area

50. Political-administrative areas (e.g., states, departments, districts) were utilized for purposes of classification by geographic area by all countries represented at the Seminar. This type of area was easily defined. In addition, using these areas facilitated the application of the results of industrial inquiries in economic programming, policy-making and administration and in designing and carrying out sample inquiries. Socio-economic areas were being utilized by a few countries and merited increasing attention as a means of supplementary classification according to geographic area.

d. Other characteristics of the industrial unit

51. It was noted that countries represented at the Seminar made considerable use of classification according to kind of legal organization, but little use of schemes of classification for kind of economic organization or type of operation.

e. Commodity classification structures

52. The Group agreed that the commodity classification scheme utilized for raw materials and products was of key importance in both the collection and the use of data on individual raw materials and products. From the point of view of requirements for commodity data on raw materials and products, it was desirable that the same classification scheme be utilized for both products and raw materials, and that this scheme and that utilized for classifying commodities in external trade be reciprocally convertible. It would also be advantageous if the schemes of classification for commodities

/and kinds

and kinds of industrial activity were related to one another so as to facilitate identification of the commodities which were the principal or secondary products (or the primary or secondary raw materials) of each kind of industrial activity.

53. Three somewhat different approaches to commodity classification schemes had been adopted by countries represented at the Seminar. In one approach, the commodity classification scheme for industrial statistics (which was the same for raw materials and products was, to a large extent, derived from the commodity classification scheme for external trade statistics and was completely independent of the industrial classification scheme. However, it was possible to establish the inter-relationships between the commodity and industrial classification schemes by cross-classifying data on output of products or consumption of raw materials by class of commodity and industrial activity.

54. In the two other approaches the commodity classification scheme was closely linked to the industrial classification system. In one case, this had been done by utilizing the code for each kind of industrial activity as the first part of the code for each of the commodities or commodity classes that were the primary products of that kind of industrial activity. In the other case, commodities were linked to industries by enumerating, under each kind of industrial activity, the products and raw materials that were both primary and secondary to that kind of industrial activity. In the first of the two approaches, the code assigned to a particular commodity was the same irrespective of the kind of industrial activity characterizing the establishment in which it was produced; and the code for a particular commodity was generally the same, whether reported on as a raw material or as a product. In the second approach, the code assigned to a particular commodity differed according to whether it was reported on as a raw material or as a product and according to whether it was the primary product (or primary raw material) of one kind of industrial activity and the secondary product (or secondary raw material) of another kind of industrial activity. Addition, by means of tabulating equipment, of all the data on the output of a particular commodity or the input of a particular raw

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material might, therefore, be difficult. In either of these two approaches to a scheme of commodity classification, the work of linking the scheme adopted in industrial statistics to that utilized in external trade statistics involved detailed matching, commodity by commodity.

55. The Group felt that advantages attached to a system of commodity classification which consisted of at least two levels of classification detailed categories for the more precise distinctions to be made between commodities; and broader categories (e.g., classes of commodities) into which these detailed categories might be telescoped. The use of a classification schemes with many levels ensured the flexibility required in gathering and tabulating data. The commodity detail in which data on products and raw materials might be gathered might vary among different kinds of industrial activity and, for the same establishments, from one year to another. It was also feasible to seek and issue greater commodity detail in benchmark inquiries than in annual inquiries.

B. The Tabulation of Statistics by Various Characteristics and the Detail of Classification

56. The Seminar concurred in the international recommendation that all of the data gathered in benchmark and annual inquiries should be tabulated according to kinds of industrial activity. Several members of the Group felt that more of the statistics gathered in benchmark and annual inquiries should be tabulated according to geographic area than was suggested in table 2 of the document, International Recommendations in Industrial Basic Statistics (Series M, No. 17, Rev.1). In particular, though not provided for in the international suggestions, tabulation by geographic area of data on expenditure for and sales of fixed assets and on inventories could provide data needed for regional planning and regional estimates of capital formation. It was agreed that the extent to which tabulation by area was required would depend on the size, industrial diversity and needs of the country concerned.

57. The Seminar noted that considerations bearing on the reliability and confidential nature of data and on timeliness of publication might limit the extent to which detailed data could be issued classified according to kinds of industrial activity, geographic area, or size of the establishment.

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This was particularly the case of annual surveys.

a. The organization of tables and set of tables

58. Most countries represented in the Seminar issued tables, including at least one summary table, setting forth aggregates on the main topics dealt with in a basic industrial inquiry, as well as separate tables of detailed statistics on each of the topics covered in that inquiry. Most countries issued separate tables for the country as a whole and for geographic areas, but fewer countries published separate tables for important individual industries. It was suggested that the publication of such separate sets might stimulate the interest of businessmen in the results of industrial inquiries.

b. Historical statistics and analytical ratios

59. Very few of the countries represented in the Seminar had published tables comparing the main statistics resulting from series of industrial inquiries. The Group noted that the compilation and publication of comparative historical data in summary fashion would be valuable both to the statistical agency (e.g., in checking and evaluating the data for the last industrial inquiry in the series of inquiries) and to many users of industrial statistics. It was noted that the compilation of historical data might sometimes be time-consuming because of the need to adjust the data for changes in the scheme of industrial classification, differences in response rates, etc. that might have taken place, so that the figures issued for different periods of time would be comparable. Despite the difficulties, it would be desirable, in many cases, to issue comparative historical data on the main aggregates resulting from basic industrial inquiries.

60. Most of the countries represented in the Seminar had not published data on analytical ratios, such as the ratio of wages and salaries to value added, either in the form of absolute figures or of the number of industrial establishments distributed according to class intervals. The compiling of frequency distributions of industrial establishments for various analytical ratios would be far too time-consuming and costly for most countries. That would not be the case for absolute figures of the various analytical ratios

/for groups

for groups of industrial units (e.g., all those falling into a particular class of industrial activity and size). A number of countries represented in the Seminar had, however, computed ratios of wages and salaries to value added, of value of gross output to value of raw materials, fuels, etc. consumed and other ratios for individual establishments in critically reviewing questionnaires for these establishments. These computations had proved valuable in detecting inaccuracies in reported data. Computing such ratios for groups of industrial units would also be of value in the critical review of the data to be published as well as of use in highlighting the significance, for economic analysis, of these data.

c. Tables in infrequent and annual inquiries

61. The Seminar noted that the forms set out in Annex I of document, ST/STAT/CONF.8/L.3, were only meant to suggest the type of tables which might be compiled, though they were based on the international recommendations on the statistics which should be classified according to each of the characteristics of the establishment. It was apparent from the discussion that, in general, countries had issued the results of their annual and less frequent inquiries in tables very much like those suggested in that Annex. The major differences between the tables set out therein and those issued by countries reflected: (i) the greater number of statistics that countries tabulated according to geographic area - a matter that had been discussed earlier; and (ii) the difficulties encountered in gathering reliable data on expenditure on and sales of fixed assets and on inventories.

IV. PROCESSING AND COMPILING OF INDUSTRIAL STATISTICS

62. The Group discussed the processing and compiling of industrial data against the background of the material contained in Studies in Methods: Industrial Censuses and Related Inquiries, Series F, No. 4, Vol. I, Chapter XV.

A. Editing

63. The Seminar considered, in some detail, the importance of detailed editing of questionnaires in order to ensure the publication of reliable statistics. The group indicated that certain editing procedures were common to all the countries of Latin America. These were completeness checks (i.e., scrutiny to make sure that all questions had been answered)

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and simple mathematical checks (i.e., to see that reported totals coincided with the sum of the reported detailed figures that made up the totals). A number of countries also reported extensive use of consistency checks.

64. One type of consistency check involved comparing the ratios for individual establishments to those normally found among establishments of a similar kind and size when, for example, (i) value of output was divided by value of consumption; (ii) value added was divided by wages and salaries; (iii) average wages and salaries paid to each employee was computed or (iv) the quantity of the main raw materials consumed per unit of main individual products made was determined. It was recognized, however, that the application of the last internal consistency check would have to be restricted to relatively few products.

65. Emphasis was laid on the desirability of establishing ranges within which the computed ratios would have to fall, so that the consistency checks could be uniformly applied. Such ranges were generally determined in one of two ways: (i) from the normal variability of the ratio for the establishments in question based on the data reported in the survey under consideration; or (ii) from the normal variability of the ratio for this class of establishments in past surveys. Where the acceptable range within which a ratio had to fall was determined from the result of the survey being compiled, it was necessary to select a sample of the questionnaires in order to compute these ranges before the editing of schedules could proceed.

66. A few countries reported that an additional type of consistency checks was utilized. This consistency check involved comparing the questionnaires received from the same establishments in successive surveys. In this connexion, attention was drawn to the advantage of using a "shuttle" schedule on which the data for several consecutive time periods would be reported. Since the use of such a form permitted both the respondent and the statistician to see the data reported in consecutive surveys, it afforded a better guarantee of consistent reporting. On the other hand, it was suggested that this device might assist the respondent in providing data which were consistent but inaccurate.

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67. The Group also discussed the question of correcting schedules that had been edited and found wanting in one or another respect. It was generally agreed that in a benchmark inquiry, which included many small establishments, correction of any anomalies appearing in the schedules for small units was best done by estimation. There was also a consensus of opinion that most of the errors discovered in the schedules for larger or for smaller establishments, where these were included in a sample and hence represented many more establishments, would have to be corrected by the respondents themselves.

68. As a means of bringing into focus the importance of the careful editing of questionnaires, the analytical techniques that were applied to industrial census data during the preparation of Patterns of Industrial Growth, ST/STAT/SER.P/1, were described. These analyses, it was pointed out, brought to light significant anomalies in the published industrial census data of virtually every country. It was also noted that most of the analytical ratios used in these analyses were similar to those suggested as ratios to be utilized in editing individual questionnaires.

#### B. Coding

69. With regard to the coding of reported data in preparation for tabulation, the Group emphasized the necessity of employing competent and well trained personnel. Careful checking of the coding work was also considered important.

#### C. Tabulation and Publication

70. From the discussions of the Seminar, it was evident that all the Latin American countries utilized mechanical equipment for tabulating the results of large-scale, benchmark inquiries. A number of countries, however, continued to use manual tabulation methods for annual and monthly or quarterly surveys, where the respondents were fewer in number. There was general agreement that, irrespective of the tabulation methods used, careful checking of the final tabulations was essential. Here again, many of the checks that might be employed were analogous to those used for the detailed checking of the consistency of individual schedules.

71. The Seminar considered, in agreement with the international recommendations, that it was essential to publish detailed technical descriptions of each industrial survey. There was also agreement that the publication of

a frank evaluation of the published data would significantly increase the value of these data to users.

72. Throughout the discussion on processing, tabulation and publication, emphasis was laid on the importance of effective organization of work and adequate staffing for the timely production of industrial statistics.

#### V. DESIGNING OF QUESTIONNAIRES FOR INDUSTRIAL INQUIRIES

73. The discussion of questionnaire design was based on the material contained in the papers, ST/STAT/CONF.8/L.4 and Series M, No. 17, Rev.1. In particular, the discussion dealt with the specimen questionnaire which formed the Annex to the paper, ST/STAT/CONF. 8/L.4, and which related to the gathering of data from large establishments in fully developed benchmark censuses. In general, there was a wide area of agreement on the way in which the queries of the specimen questionnaire were formulated. In a few cases, however, suggestions for modification or amplification of certain queries were made, some of which were approved by the Seminar as a whole. In addition, considerable discussion was devoted to practical problems that had been encountered in trying to collect certain items of data. In the following paragraphs the more important suggestions made are indicated and the common problems encountered are outlined.

##### A. Definition and Identification of the Statistical Unit

74. Consideration was first given to the definition of the statistical unit and the questions designed to identify and characterize that unit. In all the countries represented, the establishment was the basic statistical unit utilized in industrial inquiries. Also, delineation of the establishment had in all but a few instances been a relatively straightforward matter. In all countries, however, problems had been encountered in trying to sub-divide large, mixed-activity enterprises into statistical units that accorded with the basic concept of the establishment. Doubt was expressed, however, whether any general definition, no matter how detailed, could aid, materially, in the solution of this problem. Rather, the view was put forward that most large, multi-unit enterprises had to be treated on an individual basis.

75. The questions included in Part I of the specimen questionnaire were accorded the general approval of the Group. A number of participants indicated, however, that in the schedules for their inquiries, an additional question on the main activity of the establishment was included. Such a question, it was pointed out, was useful in sorting questionnaires early in the process of compilation and in checking against the industrial classification of the unit derived from the reported detailed product data.

76. With regard to Part II of the specimen questionnaire, the Group indicated that information on the legal organization of the enterprise was invariably asked for, as were the name and address of the head office of the enterprise. In very few of the countries, however, had any attempt been made at systematic identification of the establishments belonging to a specific enterprise. Similarly, in very few had data been collected for the enterprise-type statistical unit during an industrial inquiry.

B. Employment, Man-hours and Wages and Salaries

77. In the course of discussion of Part III of the specimen questionnaire, which related to employment, man-hours worked and wages and salaries paid, a number of suggestions were made. It was felt desirable, on the whole, that more detailed information than was suggested in the specimen questionnaire be gathered on the characteristics of persons engaged - i.e., each status and functional group might be sub-divided into male and female and adult and juvenile workers. These distinctions might also be carried over to the items of data on wages and salaries paid. The view was also expressed that it would be useful to collect data for functional subdivisions of operatives as well as of administrative, technical and clerical employees. It was pointed out by a number of delegations, however, that it would be difficult, if not impossible, to define detailed functional categories on a comparable basis, internationally or nationally. Further, it was thought that such data might better be gathered through special labour surveys.

78. A number of delegates reported difficulties in collecting data on homeworkers. Such workers were in many countries difficult to define, and even where the definition was satisfactory, there was a problem of eliminating

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duplication in the count of such persons when they were employed by two or more establishments. However, the Group recognized that, in some cases, homeworkers made up an important part of the number of engaged. In these instances it would be essential to identify homeworkers and include them in the count of the number of engaged.

79. In less than half of the countries represented at the Seminar were data collected on man-hours worked by operatives. In those countries where such data were not collected, it was felt that the required records were not generally maintained by industrial units.

80. There was general agreement on the definition of wages and salaries and the items of data on this topic indicated in the specimen questionnaire. It was suggested, however, that additional data might be gathered on social insurance contributions deducted from the wages and salaries paid to employees. It was also pointed out that difficulties might be encountered in including "payments in kind" in wages and salaries. Not only were such payments difficult to value, but in many cases they tended to be unreported by respondents. To help forestall the latter eventuality, it might be advisable to ask for data on "payments in kind" separately.

C. Capacity of Installed Power Equipment

81. It was agreed that the method utilized in the specimen questionnaire for requesting data on the capacity of prime movers and electric motors with a view to computing total capacity of installed power equipment was the more practical of the two techniques suggested in the international recommendations. It was recognized, however, that at least some theoretical advantages attached to the other method.

D. Electricity Purchased, Generated and Sold

82. With regard to Part V of the specimen questionnaire, several members of the Group described difficulties that had been encountered in gathering data on the quantity of electricity purchased. These difficulties were encountered with small establishments and with those large establishments whose expenditure on electricity was an unimportant part of their total expenditures. In estimating the quantity of electricity purchased in these

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cases, it had often been necessary to depend on figures of the value of electricity purchased and prevailing prices for electricity.

E. Inventories, Industrial Costs and Output

83. It was noted that Part VI of the specimen questionnaire, which concerned stocks, was designed primarily for manufacturing establishments, and that changes in these queries would be needed when data on the stocks of mining, construction and heavy capital goods industries were being sought. In the construction and heavy capital goods industries, for example, the query on work-in-process would require special treatment. Such information would usually be derived from the questions of the output of these industries, as was suggested in the international recommendations.

84. In the context of Parts VII and VIII of the specimen questionnaire, which dealt with the input and output of industrial establishments, the discussion centred on the relative advantages and disadvantages of requesting data on a consumption-production basis or on the received-shipment basis suggested in the questionnaire. A majority of the Group indicated a preference for the consumption-production approach. It was recognized, of course, that these two alternatives for seeking the data in question differed only where the establishment maintained appreciable quantities of stocks of either raw materials or finished goods. It was noted that requesting data on a consumption-production basis entailed the risk of obtaining figures of values that were not appropriate to the reference period in which the consumption or production took place. This risk was particularly great where the establishment maintained very large stocks during a considerable period of time when prices were changing rapidly. It was noted that seeking data on the received-shipment basis avoided this problem of valuation, at least in part. In addition, if the received-shipment approach were utilized, data might be requested on quantities of individual goods consumed or produced.

85. Also noted by the Seminar were the problems encountered in valuing goods received from or products shipped to other establishments of the same enterprise. The majority of the Group felt that such goods should be valued, as nearly as possible, at prevailing market prices, though it

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was recognized that this might not always be the value most appropriate to goods transferred from one establishment to another within an integrated enterprise.

86. A number of the members of the Group expressed great interest in separate data on the consumption or receipt of imported and domestic raw materials and components. Such data were required, it was felt, in order to study the relative proportions of domestic and foreign materials utilized in the various branches of industry and changes in this pattern as industrialization proceeded. These analyses were desired, for example, in formulating import policies and regulations and evaluating the effects of any proposed changes in these policies and regulations. Many participants in the Seminar felt that respondents had no difficulty in providing this information. Doubt was expressed by some participants, however, regarding the necessity or practicability of gathering these data. This doubt was founded on the following considerations: (i) If a particular material were not produced domestically, there would be no need to identify it as imported; (ii) Where the materials in question were produced domestically as well as imported, it might not be of interest to or feasible for respondents who purchased their materials from dealers to distinguish, in their accounting records, between the imported and domestically produced portions of each of these materials; and (iii) The consumption of imported materials relative to domestically produced materials might simply be a matter of chance market factors.

F. Expenditure and Sales in Respect of Fixed Assets

87. Many of the practical and conceptual problems connected with the gathering of these data had been discussed at an earlier stage of the Seminar (See paragraph 37 above). The formulation, in the specimen questionnaire, of the queries relating to fixed assets was considered to be satisfactory by most of the Group. It was pointed out, however, that there was no theoretical reason for separating expenditures on new fixed assets from outlays for major renovations or improvements, although it might, in some cases, be advantageous to request the information separately as a

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means of reminding the respondent to include such expenditure. It was agreed, therefore, that it would be best to add a statement to the effect that, if those items were not entered separately in the books of the enterprise, figures of the sum of expenditures on new fixed assets and expenditures on major alterations would be perfectly acceptable.

#### VI. METHODS OF COLLECTION OF INDUSTRIAL STATISTICS

88. The discussion of sources of and approaches to the collection of data which might be utilized in gathering industrial statistics was based on the paper, ST/STAT/CONF. 8/L.5.

##### A. Use of Administrative Records

89. It was noted that in a number of countries current data on selected kinds of industrial activity were derived from the administrative and regulatory activities of the Government. The Administration or regulation of public utilities was, in some cases, the source of monthly or quarterly data on the production and consumption of electricity. The collection of excise taxes or government regulatory activities often yielded data on the quantity of output of selected commodities (e.g., sugar, alcohol, tobacco, gold or other ores, cotton). The licensing of construction projects was the primary source of available current information on construction activities.

90. The discussions of the Group indicated that the foregoing types of sources were being drawn upon for current data primarily where it had not yet been feasible to carry out statistical surveys for gathering current industrial statistics. The data abstracted from records that were a by-product of administration had, in many instances, serious limitations. For example, comparability over time was sometimes lacking. In the case of construction, licensing systems were, in a number of cases, restricted in coverage to urban areas and to new residential building, and were not administered sufficiently strictly. Moreover, the reliability of the data obtained from licenses issued was questionable and the plans submitted at the time of application for the licenses were not always carried out. It was evident that the reliability and usefulness of data abstracted from

/administrative sources

administrative sources depended on the effectiveness and efficiency of administration, as well as on the extent to which statistical requirements were taken into account in the devising of administrative reports and regulations.

91. Records from governmental administrative activities were a basic source for the names, addresses and other information on establishments that were necessary for the institution or maintenance of industrial directories in the countries represented at the Seminar. They were a much more efficient source for this type of information than for current industrial statistics. Governmental administrative records which commonly provided such directory information were registers developed in connexion with labour inspection and control system, registers originating in a requirement that permission be obtained to start to operate an industrial enterprise, lists of enterprises paying fees for annual licenses, records of payments under systems of social security, etc. Although a number of these administrative requirements extended to even the very small establishments, it was recognized that, in practice, the coverage of such enterprises was far from complete. Another common deficiency was the lack of current information on industrial units which went out of business.

#### B. The Use of Sampling

92. The Seminar considered a number of the possible applications of sampling to industrial inquiries and several delegations described the uses made of sampling in their countries.

93. Particularly emphasized by the Group were the advantages of sampling in terms of possible savings in time and money. It was recognized, however, that area sampling methods could not often be applied where reliable data for small geographic areas were required. The following were the circumstances in which sampling was felt to be the most useful approach: (i) for the collection of data from the very small units; (ii) for the collection, in a benchmark inquiry, of particularly complex items of data for which detailed geographic classifications were not required; (iii) for the coverage of the units included within the field of an annual inquiry; and (iv) for monthly or quarterly industrial surveys.

/94. Although,

94. Although, in many cases, very appreciable savings could be made in a sample survey, as compared to a census (e.g., in the number of persons required), it was pointed out that, at all levels, the personnel needed for taking a sample survey would, in general, have to be better trained than those needed for conducting a census. Technically-trained personnel would be required for the designing of sample surveys, well-trained supervisors would be needed to establish and maintain the necessary controls over the field enumeration, and great care would have to be exercised in the collection and editing of the data.

95. Another subject discussed by the Group was the usefulness of sampling techniques for evaluating and controlling the quality of all phases of a large-scale inquiry. An area sample, for example, could be used to check the coverage of a benchmark inquiry. Or, a sampling plan could be devised in order to control the quality of the editing and coding of questionnaires.

#### VII. METHODS OF LOCATING AND ENUMERATING INDUSTRIAL UNITS AND THE INDUSTRIAL DIRECTORY

96. The Seminar based the discussion of methods of locating and enumerating industrial units on the document, ST/STAT/CONF.8/L.6.

##### A. Centralized Inquiries by Post

97. In discussing centralized inquiries (i.e., distributing and gathering questionnaires by post), the Seminar emphasized that the successful use of this approach required: (i) the availability of a satisfactory directory; (ii) the existence of an efficient postal service; and (iii) considerable understanding of the inquiry and co-operation on the part of respondents. It was noted that before the centralized mail approach was utilized in an inquiry, it was essential to make certain that the prerequisite conditions existed. Where the required conditions were present, as might be the case for large establishments, the centralized mail approach was economical and efficient. Where this was not the case, it would be desirable to utilize alternative methods of distributing and gathering questionnaires.

##### /B. Directed

B. Directed Field Inquiries

98. The Group noted that the successful use of directed field inquiries (i.e., distribution and collection of questionnaires by a field staff, based on an industrial directory), involved fewer prerequisites than the effective use of centralized mail inquiries. Although a directed field inquiry was based on an industrial directory, the field staff for the inquiry could canvass for any required additions of establishments to the directory while distributing questionnaires to respondents. Thus, it would not be necessary to have as adequate an industrial directory for a directed field inquiry as for a centralized mail inquiry. Further, because in a directed inquiry field staff would distribute and gather questionnaires, the co-operation in, as well as the understanding of, the inquiry on the part of respondents would not need to be as great as in a centralized mail inquiry. Field visitors could, for example, explain the various items of the questionnaire or help respondents provide accurate answers to various queries. The Group felt that the directed field inquiry was more appropriate than a centralized mail inquiry to the conditions existing in many Latin American countries.

C. Industrial Directory

99. An industrial directory was required in either a directed field or centralized mail inquiry and would also be of assistance in the full field inquiry that the Seminar discussed later. In view of the central importance of an industrial directory to the designing and taking of industrial inquiries, the Seminar devoted special attention to techniques and procedures for establishing and maintaining an industrial directory. The Group felt that it was important to make use, in initiating as well as maintaining the directory, of a number of sources of information that were available in most countries, on the name, address, size and, perhaps, kind of industrial activity of establishments which were candidates for inclusion in the directory. Common examples of such sources were industrial censuses, the administration of social security schemes and laws relating to labour conditions and inspections, the annual licensing of industrial establishments, or permits to start new mines or factories or to engage

/in construction

in construction. Possible additions to the directory obtained from sources other than industrial censuses would need to be checked against establishments already included in the industrial directory and to be written to in order to verify and supplement information.

100. The Group stressed the desirability of having a continuing and permanent section devoted to the work of founding and maintaining the industrial directory. To be most useful the directory not only had to be complete and reliable as of one period of time but also had to be kept current of the establishments which went in and out of business, changed their name, moved, etc. This involved working knowledge of and arrangements with the sources which could supply information on current changes, detailed familiarity with the history, procedures, etc. of the directory, and staff to keep abreast of the work.

101. The Group also discussed the directory forms utilized by countries for recording the information on each establishment and the sorting and classification of these forms. In this connexion, attention was drawn to the advantages of utilizing a combination punch-and-address card for the directory. Such a system was very convenient in classifying, selecting and filing cards as well as in imprinting questionnaires and other forms for respondents.

D. Exhaustive Field Canvassing and Enumeration

102. The Seminar next considered inquiries consisting of exhaustive field canvassing and field enumeration - i.e., thorough canvassing by field staff to locate and identify establishments for inclusion in the inquiry and completion of questionnaires by field visitors. It was felt that this costly approach to taking an industrial inquiry should be utilized only when a directed field inquiry would not be successful. The gathering of data from very small establishments, for example, was likely to require detailed field canvassing and completion of questionnaires by field visitors. It was, in general, not possible to maintain an adequate directory for these establishments, and locating them required entering all types of structures and premises. Moreover, the very small units could not be expected to complete even simple questionnaires without considerable assistance from field enumerators.

VIII. COMPILATION OF INDEX NUMBERS OF INDUSTRIAL PRODUCTION AND  
OTHER INDICATORS

103. The compilation of index numbers of industrial production and of other indicators was considered on the basis of the papers, ST/STAT/CONF.8/L.7 and United Nations Statistical Papers, Series F, No.1.

104. The discussions of the Seminar indicated the importance of developing or improving current (i.e., monthly or quarterly) industrial statistics in a number of Latin American countries. Many of the countries did not compile, on a current basis, index numbers or other comprehensive data on industrial production, employment, man-hours worked or wages and salaries. And, participants in the Seminar from some countries which had current industrial data felt that some of these series, particularly index numbers of industrial production, were not sufficiently reliable. As the urgency of having adequate index numbers of industrial production and employment was generally recognized, a number of countries were starting to compile such indexes or taking steps to rationalize and expand their present systems. Some of these countries proposed to begin with annual index numbers of industrial production and employment since the basic data required to compile those statistics were already being gathered.

105. It was indicated that systems of annual index numbers would satisfy a number of the important needs for data on the industrial sector. However, in many situations more current indicators of developments in the industrial sector were required. Though it was desirable that data on at least the output and employment of the industrial sector be available monthly, the possibility of compiling monthly index numbers or other comprehensive data on industrial production, employment, etc. depended on (i) the character and co-operation of the industrial sector (e.g., the extent to which smaller establishments needed to be covered; the speed of response to questionnaires) and (ii) the availability of statistical personnel, equipment and other resources. If it was not practicable to compile and issue monthly data rapidly, it was preferable to begin with quarterly series.

/A. Object

A. Object and Character of Index Numbers of Industrial Production and of Other Activities

106. It was noted that index numbers were not infrequently issued instead of absolute figures because, given the same primary data in making estimates, the margin of error would, in general, be less in measures of change in the level of an activity, such as index numbers, than in measures of the level of the activity itself, such as absolute figures. Furthermore, index numbers of industrial production provided means for indirectly measuring the change over time in value added at constant prices.

B. Classification and Field of Coverage of Systems of Index Numbers

107. In all of the countries represented at the Seminar where systems of index numbers were computed, index numbers were being compiled starting from categories of industrial activity that were as detailed as possible. This assured the use, in combining indicators, of value-added weights at as early a stage in compilation as was possible. It also improved the correlations in the change over time between the activities for which imputations were made and those which were taken to represent the activities which were not measured directly.

108. The manufacturing and mining divisions of the industrial sector were those most commonly covered in systems of index numbers of industrial production. Construction was the least frequent covered. In the case of manufacturing, certain kinds of industrial activity (e.g., the manufacture of clothing, metal products) were sometimes omitted owing to the difficulties of obtaining suitable indicators or the prevalence of small establishments. Some countries, because of the prevalence of small establishments in various manufacturing activities and the considerable difficulties of gathering current data for these units, restricted their systems of index numbers to larger establishments → for example, those engaging five or more persons. Other countries, however, did not find it necessary to do this, though data were not gathered for small establishments, in view of the insignificant contribution of small units to the volume of the activity being measured. This was less true of index numbers of employment than of index numbers of production. It was noted that the results of annual industrial surveys and of infrequent censuses provided excellent bases for

/periodically extending

periodically extending the field of coverage of a system of index numbers.

C. Formulae, Weights and Base Year

109. The Laspeyre formula - the fixed-base-weighted arithmetic mean - was the one most commonly utilized. One country, however, employed the Fisher "Ideal" formula. As far as possible, weighting patterns were based on value added. Gross weighting often had to be used, however, in combining elementary series of indicators.

110. It was noted that the base year should preferably be changed at least once every five years when rapid industrial development occurred, and that five-yearly benchmark censuses would provide the means of doing so. Otherwise the rise of new industries, the sharp expansion of nascent industries or other changes in the structure of the industrial sector would not be adequately reflected in the index numbers of industrial production. One view expressed was that it might therefore be advantageous to adopt linked, moving-base-year indexes despite the practical difficulties that might be associated with their use.

D. Elementary Series of Indicators

111. Quantities of individual commodities produced were utilized as elementary series of indicators as far as possible. A point emphasized was that for this purpose it was essential to specify precisely each commodity, limiting it to a narrow range of possible change in quality, and to have a relatively restricted number of precisely-defined commodities which accounted for a large part of the production of each kind of industrial activity covered in the system of indexes. In the case of some of the industries producing highly fabricated goods (e.g., wearing apparel, pharmaceutical products, heavy machinery), it was not possible to select commodities which met these specifications, and other kinds of elementary series of indicators had to be employed. The quantity of individual raw materials consumed or man-hours worked had been adopted as alternatives in most cases. The Group noted that when either of these series were utilized, it was necessary to compare, periodically, the actual volume of output to the actual quantity of the pertinent raw materials consumed or man-hours

/worked in

worked in order to make adjustments in the indicator series for any changes in this relationship. It was also suggested that increasing use might have to be made of deflated gross value of output as series of indicators, provided appropriate and reliable price series were available.

112. In most instances, the commodities, raw materials and/or establishments which were to be covered in current reporting programmes for purposes of obtaining elementary series of indicators were selected on the basis of importance. In some instances probability sample designs were employed for this purpose.

113. The discussions of the Group emphasized that an important problem was that of maintaining the comparability and currency of elementary series of indicators.

114. In any monthly or quarterly inquiry, non-response was a common difficulty and, in the case of index numbers of industrial production, employment, etc., adjustments had to be made for non-respondents to avoid distortions in the figures for the series of index numbers. Such adjustments consisted of computing ratios of the figures for respondents for the current period to the figures for them for the immediately preceding or base-year period. Comparison of the current period to the immediately preceding period was preferred, since it was likely to maximize the correlations between respondents and the universe.

115. Also, particular commodities or establishments for which elementary series were being gathered might disappear from the market or lose their importance and would need to be replaced by other commodities or respondent establishments. In the case of such substitutions, the new elementary series would be spliced (linked) to the replaced elementary series.

116. Further, important new and additional commodities, industries or establishments might enter production. In these instances one of two approaches might be utilized to introduce the required new elementary series. The weight assigned to cognate elementary series (commodities, establishments or industries) might be sub-divided between these and the new elementary series. In that approach the additional elementary series would be introduced into the system of index numbers by slicing, and the

/resulting index

resulting index numbers would not show, for the period when the new elementary series were introduced, additions to the volume of industrial production represented by the new commodities, establishments or industries. In the second approach, the weight (i.e., value added in base period prices) assigned to the new and additional elementary series might be added to the weight assigned to the old and continuing elementary series in the numerator, but not in the denominator, of the index numbers for the period during which new elementary series were being added. In this way, the addition to the volume of industrial production represented by the new commodity, establishment or industry would be reflected in the index numbers. In the second approach, the weights for the index numbers for periods subsequent to that for which the new elementary series were introduced would include the additional weight assigned to the new series, and the index numbers for the subsequent periods would be spliced to the corresponding index numbers for the period for which the new elementary series were introduced.

E. Adjustment to the Results of Annual and Less Frequent Industrial Inquiries

117. The Group noted the desirability of utilizing the results of annual and less frequent inquiries for adjusting index numbers of industrial production or employment. The results of these inquiries would provide the basis for periodically widening the field of coverage of the index numbers and markedly increasing the number and coverage of the elementary series utilized as indicators. The results of the basic industrial inquiries might also permit the application of the Geary-Fabricant approach to constructing index numbers of industrial production, a procedure which would give a much better approximation of the change in value added at constant prices than the use of elementary series of indicators relating only to the output of products and the input of raw materials or of man-hours. The Geary-Fabricant approach demanded, however, good price series on both products and raw materials.

/118. Comprehensive

118. Comprehensive industrial censuses, and even annual surveys, would also provide the basis for shifting the base period of a system of index numbers. In general it was desirable to utilize cross weighted formulae (e.g., the Fisher "Ideal" or Edgeworth formula) for passing from one base period to another.

Annex I

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