STATISTICAL COMMISSION
Fifth Session
Item 5 (c) of the Provisional Agenda

CENSUSES OF INDUSTRIAL PRODUCTION

1. At its fourth session, the Statistical Commission requested the Secretary-General to submit, at the next session, a survey of the present form and scope of industrial censuses in different countries, with a view possibly at a later date to proposals being made by the Commission for greater comparability in such censuses between different countries.

2. The attached paper (E/CN.3/110/Add.1) is submitted in response to this request. In it the main aspects of the present form and scope of censuses of industrial production are listed and the problems briefly considered. Attention is drawn to differences in national practices in meeting the problems and in some cases tentative conclusions are drawn.

3. The references to existing practice are illustrative, not exhaustive. Only the material available to the Statistical Office was used, supplemented in a very few cases by special requests for information, and from this material representative examples have been taken.

4. The survey is limited to the concepts and definitions used in censuses, and the questions of general procedure which are directly raised. No account is given of the detailed procedures by which the data are obtained, analysed, and tabulated.

5. It is clear from this preliminary survey that a number of steps can be taken by countries to improve international comparability and to clarify the scope of censuses to be taken in the near future. It
may be noted that 15 countries have plans to take censuses in the years 1950-52, while 8 others take censuses annually. For this reason it is suggested that the points in paragraph 6 be drawn to the attention of countries, pending the adoption by the Commission of recommendations designed to cover the whole field.

6. It is desirable that each country, in which industrial production is important, should plan to take a census in or around 1952, and thereafter to take censuses at five-yearly intervals or more frequently. Such censuses should:

(a) cover at least mining, manufacturing, construction, electricity and gas, i.e., the activities included in major groups 11 to 51 inclusive of the International Standard Industrial Classification of all Economic Activities. If countries do not cover these activities in the census they should make similar data available by other means. In principle the census should embrace factories, workshops and handicrafts. The census should be called "the census of industrial production".

(b) adopt the International Standard Industrial Classification of all Economic Activities, or one which can be translated into this classification. Separate figures should be given at least down to the group (3-digit) level of this classification, (unless production in any 3-digit group is negligible); and, within this framework, further sub-divisions should be shown according to national requirements.

(c) collect data to enable "net output" to be computed, i.e., value of products less cost of materials and fuel and of work given out, as a first approximation to a measurement of contribution to national product. It is desirable that figures should be collected on the components of net output also, in order that the contribution to national product may be measured more exactly.

(d) use, as basic unit for general census statistics, the "establishment", the individual plant where production takes place. Data on enterprises should also be collected in
countries where financial inter-relations between establishments are important.
(e) on labour resources, should collect the following data as a minimum:
   (i) Numbers employed, wages paid, and, if possible, man hours worked.
   (ii) An analysis of numbers employed by sex and broad age groups.

7. The Statistical Commission therefore may wish to request the Secretary-General:
   (a) To continue the study of censuses of industrial production, and at the next session to submit draft recommendations aimed at improving current practices and promoting international comparability in this field.
   (b) To prepare a manual, if necessary with the assistance of an expert consultant or consultants, on procedures for taking a census of industrial production, with particular reference to the problems of under-developed countries.
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THE FORM AND SCOPE OF INDUSTRIAL CENSUSES

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Chapter 1. The Field to be Covered

1. Production is carried on in a variety of forms of organisation of which
the following need to be distinguished for the purpose of determining the scope
of industrial censuses:
   (a) Production for own use, or for use of a small community, with occasional
       barter of surpluses;
   (b) Production for sale, of goods made within the household (home crafts);
   (c) Organized handicrafts;
   (d) Factories, large and small.

2. Although ideally a census of production should cover all production, irrespective
   of the form of organisation, the simpler forms of production present
great technical difficulties. To be covered by the normal methods of industrial
   censuses, production needs to be continuous or at least intermittent, and to
   have a recognisable location. In practice, too, homecrafts are omitted even
   though they have a location because of the impossibility of separating them
   from other activities of the household. To be accessible for an industrial
census, therefore, a productive unit has to occupy separate premises, which
limits the field to factories and organised handicrafts.

3. The omission of the primitive forms of organisation is universal. In
   advanced countries the limitation is unimportant because the excluded types
   of production are virtually absent, but in underdeveloped countries it results
   in the omission of important elements of the economy. However, it does not
   follow that the simpler stages of production cannot be measured; they may be
   covered for instance in the framework of a census of population by an extended
   household schedule.

4. Factories and handicrafts are by no means always completely covered, how-
   ever. Nearly all censuses exclude some part of the field. The criterion for
   exclusion is not usually the class or type of the establishment, e.g. factory,
   workshop or handicraft, but rather its size. This is because it is difficult
   to distinguish between small factories, workshops and handicrafts.

5. In some cases, the coverage of the census is defined by the adoption of an
   administrative instrument as the basis of the census lists. Thus, in India
   where the census is based on the factory inspection system, it is limited to
   establishments employing 20 or more persons. Even when the coverage of the
census is not limited in this way by the use of an administrative instrument, a lower limit of size is usually adopted for reasons of economy and practicability. The criteria used vary considerably from country to country. It may be number of persons employed (U.K.), value by sales (U.S.) or use of power combined with employment (South Africa). Even with the same criterion there are differences of actual figures, U.K. (1935) 10 employees; Guatemala (1946) 5 employees. The criterion may vary from industry to industry, (e.g. Germany 1936) including minimum payroll, consumption of some raw materials or minimum output. Another method of excluding small establishments is to omit certain industries where all or the great majority of the establishments are very small (wig-making in the U.K.).

6. The effect of excluding small establishments clearly varies from country to country and is an important cause of lack of comparability between census results. The only way to attain complete comparability would be by complete coverage within the categories embraced by the census, i.e. factories and handicrafts. In principle, therefore, such establishments should be covered. However this is, in general experience, impracticable. So far as possible small establishments should be covered by a simple return, or if even this is impracticable, by sample enquiries. The census results can then contain estimates of the whole of industrial production, with large establishments shown separately.

Chapter 2. The Census Unit

7. The first question arising in the taking of a census is the choice of the census unit to which the census questions will be addressed. While in censuses of population the unit is clearly the "person", the unit of production for industrial censuses is not so evident. Of the four possible units that have been distinguished however, namely the enterprise, the establishment, the technical unit and the operational unit, the establishment or individual plant has been universally adopted. This is because normally the establishment is small enough to be allocated wholly to one industry, but big enough to be able to provide answers to the questions on the census form. The enterprise too often straddles more than one industry. An attempt to use the operational or technical units would raise too many problems such as the allocation of overhead charges which in their nature apply to the whole establishment. Data on
the physical resources of industry are always available at the establishment level, since such items as power equipment and buildings are the embodiment of the establishment. Data on labour are as a rule collected at the plant level, and on occasion are available at the level of the technical unit. Total output too can be obtained at the plant level, also data on most materials used and wages paid, but certain expenditures of the enterprise may not be directly attributable to individual plants and have to be allocated among them.

8. Though no case is known where a unit basically different from the establishment is adopted, the definitions used in different censuses vary in detail. The central notion is unity of location - the establishment is the place where production is carried on. A rigid definition is seldom attempted. As a rule it is explained in the census instructions in terms of examples; thus the establishment is referred to in the Australian census as a "factory, workshop or mill" and in the U.S. as "a single plant or factory". The explanations are no doubt clear enough in practice, but certain difficulties of interpretation that may arise are described below.

9. However, though statistical convenience and general practice point to the choice of the establishment as the census unit, there is also a considerable interest in information on the enterprise, because of its usefulness for the study of control and concentration in industry, and because it establishes benchmarks for current financial statistics. The collection of data on the enterprise does not necessitate the use of the enterprise as the census unit, but calls either for additional questions in the establishment schedule, or a separate count of enterprises.

10. The first difficulty in applying the notion of the establishment in practice arises when two or more producing units are closely associated for technical reasons or by joint ownership and control. If they are situated apart from one another even if by only a short distance they are usually treated as separate establishments. This is not a universal rule - and it has always to be interpreted in a common sense way - but it is the most common procedure.

11. Another set of difficulties arises from the fact that a geographical unit may embrace different sorts of activity. They may be activities appropriate to different industries, or main and ancillary activities, or non-manufacturing as well as manufacturing activities. These cases are considered below.
(a) **Multiple production**

12. If the output consists of products appropriate to more than one industry there is a choice between separating the business into several units each of them called an establishment, or treating it as one establishment in spite of the difficulty of determining its proper place in the classification. Where separation is decided on, the following criteria are used:

1. **Separate accounting.** Where separate records are kept for the various component parts of the business, it is easy to treat them as separate units. The U.S. census of 1948 makes use of this principle. Mixed businesses without separate records are attributed to one industry only and treated as one establishment.

2. **Physical separation.** If floorspace and equipment for the several activities are separated from each other the resources devoted to each industry can be allocated with comparative ease. The censuses of the U.K. define separate "departments" devoted to two or more "distinct trades" as individual establishments.

3. **Other "appropriate" means of separation.** The Census of South Africa stipulates that where two or more distinct manufacturing businesses are carried on by the same firm in the same factory, a separate return should be completed for each industry, and joint items apportioned in an appropriate way, the industrialist being left to determine the figures "from his knowledge of the facts". Other countries refer simply to "the relative importance" of the various sectors concerned, to "what appears the most logical way", to a "reasonable" allocation, and so on.

13. In cases where separation does not appear feasible, the establishment comprises activities attributable to several industries. In order to classify these mixed businesses, either new headings for combined industries must be raised in the system of classification, which would be somewhat confusing, or the minor activities of the establishments must be disregarded altogether in deciding on the classification. The latter practice is usually followed, and the classification of the unit is determined by its principal product or combination of products.
14. In an integrated unit comprising several stages of production (and thus possibly several industrial groups in an industrial classification), there is not necessarily a principal product. Instead one product may go through various stages of fabrication. In these cases, unless the stages are treated as separate establishments the classification of the whole unit is decided by its final product.

(b) Ancillary and non-manufacturing activities

15. In general no attempt is made to separate off ancillary activities from direct production processes, because of the difficulty of allocating costs and results. One special problem, however, that of separate administrative offices, is mentioned in some censuses. If basically the definition of an establishment depends on unity of location, it follows that an administrative office set up in a separate place should be treated as an establishment on its own, and this practice is frequently followed, even to the extent of classifying the office not under industry but under commerce. Whether or not they are separately counted however the International Standard Industrial Classification recommends that a separate administrative office should be assigned to the industry of its manufacturing plant.

16. Many industrial censuses exclude non-manufacturing activities in which the establishment may engage, such as the buying and selling of commodities not produced by the plant. (India, South Africa).

Construction work

17. Another activity generally excluded from the output schedule is major construction work carried out in the plant by the labour force of the establishment, though the data on the labour force may include the workers engaged, and the materials bill may include the materials used, in this activity. This output should not be missed altogether. It should either be included with the manufacturing output, as a special case of an ancillary product, or recorded on a separate construction industry, ideally with the corresponding labour force, equipment and materials.
Chapter 3. Scope and Grouping

10. Two major problems come under this heading. The one is the definition to be adopted for industry; the other, the most appropriate grouping of individual industries within this field.

(a) The definition of "industry"

19. It is proposed in E/CN.3/85 that the field to be covered in an index of industrial production should be manufacturing, mining and quarrying, construction, electricity and gas. The same field is appropriate for censuses of industry. This definition is in good accordance with the common use of the term "industry". However, the scope of actual censuses varies greatly as between countries. The main differences are as follows:

(i) Many censuses are confined to manufacturing, sometimes supplemented at different periods by census surveys of the other sectors. An example is the U.S.A. which regularly takes a census of manufactures and less frequently censuses of mining, construction and business.

(ii) Some censuses, on the other hand, cover both industry and commerce, e.g. the Greek census of 1930. This census extended beyond the limits of trade in its narrower sense, including financial activities, hotels and theatres.

(iii) Another type of census, e.g. the Egyptian census of 1944, is nominally limited to industrial production, but actually reaches into the agricultural sector (cotton ginning, cotton pressing). The Belgian census of 1937 interprets industry as comprising certain activities commonly regarded as not belonging to manufacturing such as fishing and the operation of fish farms and oyster beds.

(iv) There are differences between censuses, and between consecutive censuses of the same country, in the extent to which certain service items are included. Thus the U.S. censuses have generally included more types of repair work than the U.K. The U.K. censuses until 1930 included laundries and thereafter omitted them.
(b) Grouping

20. The classification of industries and industrial groups adopted by different countries varies very greatly. First the industries specified, and their grouping, are quite different from country to country. The Statistical Commission has adopted the International Standard Industrial Classification of all Economic Activities, to be used, inter alia, for "census of manufacturing, mining, agriculture, distribution, etc." The extent to which the I.S.I.C. has been introduced into national publications is so far small. The only case known to the Statistical Office is the Danish industrial census of 1940, the main results of which have been re-arranged in accordance with the international classification.

21. Second, the degree of detail given differs; for example, Egypt covers 41 different industries, while Germany in 1933 covered 619 different industries. To a considerable extent the differences arise because of different degrees of industrialisation and of the diversity of industries in different countries; but many other differences also occur. For many problems, including the study of productivity, detailed figures are needed. It may be suggested that separate figures should be given at least down to the group or 3-digit level (in terms of the I.S.I.C.), unless production in any group is negligible, with further sub-divisions according to national requirements.

Chapter 4. The Output

22. The output of an establishment during the period covered by the census consists of goods produced and services rendered by it during that period and in principle this is the data obtained in most censuses. Some countries, like Germany (except in 1936), Austria, Switzerland and Belgium however, do not include any information on output in their census schedules. Goods produced in the period whether sold or transferred to another department or in stock are included. For convenience of reporting the amount shipped or sold is often asked in lieu of the amount produced, (for instance U.K. 1946: goods sold during the year; and U.S. 1947: products shipped) but this amount needs to be further adjusted by the change in stock or inventory between the beginning and the end of the period. In this method of counting, therefore, goods sold plus the stock at the end of the period, less the stock at the beginning of the
period represent the amount produced during the period. The use of this method throws up a problem in certain cases where the goods take a long time to make e.g. ships or complicated machines. In these cases, a question is sometimes included on the value of work put in place, on work in progress in order to adjust the figures of output (e.g. U.K. 1948). Some countries (U.S. 1939; U.K. 1948; Germany 1936) include salable scrap and refuse in output.

23. With regard to the valuation of goods, the normal practice is to request the ex-factory net selling value, that is, selling value at the factory net of (1) discounts or rebates, allowances for returnable cases, etc. and any other drawbacks allowed to customers and (2) payments to transport firms, railways, etc. for carriage outwards. If delivery is made by employees of the establishment no such deduction is necessary. This is the practice of e.g. India 1947; U.K. 1948. Indirect taxes levied and subsidies or bounties paid are normally not included in the value of the goods. A problem arises in the case of goods transferred to other departments of the establishments or to related enterprises since the book value of the transfer may be different from the market value; nevertheless the book value is generally accepted though in the U.K. an adjustment is required in certain cases. For goods remaining in stock it is also the usual rule to admit the book value but in some countries such as New Zealand valuation at market selling price is required. When prices are falling the method of adjusting total value of sales by adding the market value of stock at the end of the year and deducting that at the beginning of the year results in underestimating the value of production; and the reverse is true when prices are rising.

24. Services of many kinds are specified in the schedules of different countries. The most common kind is contract work done for other establishments, which usually consists of work done on materials supplied by other establishments. Sometimes this question is confined to industries where the practice is common. Repair of the firm's own buildings and plant carried out by the firm's own labour force is, not commonly considered as output (although the material used and the wages paid to the employees are considered a part of materials consumed and total wages and salaries respectively), since this work is treated as a necessary part of the productive process. In this respect such work differs from new capital assets made by the establishment's own employees which are commonly charged to capital account. The value of services returned is the actual amount received.
25. The term used for the total value of goods produced and services rendered differs from country to country. For convenience the term "gross output" will be used in the following discussions. This is the term used in the U.K. and adopted by the Conference of the British Commonwealth Statisticians in 1935. Apart from the total value of output data is commonly collected on the quantity and the value of individual items. Detailed information by types and qualities is sometimes obtained for important products in special schedules (U.S., U.K., South Africa, Canada).

26. The sum of the gross output for different industries contains much duplication because the products of one establishment or industry often form the materials of another. To eliminate duplication the cost of materials including that of fuel and power and the amount paid for contract work is usually deducted. (In a small number of cases, however, the questions have been confined to the sales value of output, e.g. Norway 1936). The residue is called the "net output" (e.g. in U.K.), or the "value added by manufacture" (e.g. in the United States). This net value still included the cost of many expenses which the establishment pays to outside firms or organisations and which would have to be deducted before the remainder would correspond to "gross national product" excluding indirect taxes. The latter would have to be further reduced by the amount of depreciation charges to correspond to net national product. Few censuses make deductions beyond materials, fuel and contract work in arriving at net output, however, though many attempts have been made to collect data on the components of net output, most recently in the latest U.K. Census of Production.

27. The materials, the value of which is to be deducted from gross output, almost always refer to materials consumed as distinct from materials purchased (e.g. U.S.A. 1947). An exception is the U.K. census of 1948 which collects figures on purchased goods, and accompanies the question with another on changes in stocks of materials, so that quantities consumed can be deduced. Typically the valuation principles correspond to those applied to the output, namely the value of the materials at plant, net of discounts and allowances, including transportation charges to the works unless the goods were carried by the establishment's own transport, (e.g. India 1942). The coverage differs slightly between countries, but in general includes, in addition to materials and parts for direct processing, workshop materials and supplies and sometimes (U.K. 1948)
office supplies, water charges and materials for ordinary repair carried out by the establishment's own labour force. Materials produced in the same establishment are not included, but materials transferred from another establishment of the same firm are. Materials simply bought and sold are usually excluded. A difficulty arises in the treatment of capital items. Machinery and new parts and materials used in new construction are normally excluded. To correspond with accounting practices, materials bought for major repairs and additions should be excluded but this is not always mentioned in the schedules.

28. In addition to the total value of materials, data is frequently collected on important individual items. Most countries itemize the materials on which they require data, the list usually varying from industry to industry, but some (Egypt, Colombia and Brazil) leave the listing to the respondent.

29. Fuel and electricity are included in the materials bill in nearly all censuses. In a few, e.g. New Zealand, the cost of fuel and power is not deducted from net output. Normally, however, fuel and power are treated in the same way as materials e.g. for valuation. In industries where coal constitutes a process material, for instance the gas industry, it is included with materials.

30. The value figure collected for contract work done is normally the amount actually paid. Some countries include this question for all industries, others for selected industries only, and in a few countries (e.g. Australia and Canada) no data is collected.

31. In addition to the customary deduction of the cost of materials, fuel and work given out on contract, some countries have gone further. Not infrequently, questions have been asked on depreciation with a view to deducting it from net output. The U.S. included this question between 1900 and 1910, the Netherlands in 1920, and at present New Zealand, Luxembourg, and India collect the data.

32. Questions on expenditure on business services such as insurance have also been asked in different censuses. Examples are New Zealand which collects data on all business expenses, and the U.K. which in the latest census included a question on payments for services rendered by other firms.
33. Besides data on gross and net output, some censuses have collected data on the origin of materials and the destinations of products. Information on some inter-industry relationships is of course revealed by the general analysis of materials and products into types; thus steel bars clearly originate in the steel industry and beer bottles are clearly going to the brewing industry. In addition however materials are sometimes divided into domestic and imported (e.g. South Africa) and products into domestic and exported (e.g. Germany 1939). These questions refer only to goods directly imported and exported and even so they encounter the difficulty that some goods pass through dealers' hands and the respondent may not know the ultimate origin or destination.

Another example, of selective sales analysis is Sweden, which requested information on products going to military uses. The two main examples of comprehensive sales analysis are the U.S. census of 1939, and the U.K. census of 1948; the classifications adopted differ slightly, but are broadly similar, namely into (1) inter-company sales, (2) sales to other industries, (3) to wholesalers, (4) to retailers, (5) to the public, (6) to export.

Chapter 5. Labour Resources and Wages

34. The basic questions arising under the heading are:

(a) How many workers are engaged in production?
(b) What are their characteristics?
(c) How much are they paid?

35. With regard to the first question the main object is to determine how many workers produced the output returned in other parts of the census schedule. Therefore the number of workers falling within the definition of the establishment on which the output figures are based, should be shown separately. This number includes supervisory and clerical workers associated with the production, but will exclude those engaged in activities such as merchanting of products not made in the establishment, or selling or shipping in a separate sales or shipping department, or working in departments such as the canteen or cafeteria. It is the practice of most countries to include working proprietors and active firm members, but they are excluded by some countries; and even in those where they are included their remuneration is often excluded from the total amount of salaries and wages, (e.g. Great Britain and Australia).
36. The labour statistics in an industrial census, however, also frequently serve as benchmark data for current employment statistics. If there are any workers connected with the establishment (and therefore not returned on the schedule of any other establishment), although not directly associated with the production, they should also be returned, though separately from the production workers. The latest census of the United Kingdom (1948) follows this practice.

37. When the scope of the figures is decided, it remains to determine the date of reference. For obtaining a definite figure of persons employed or engaged it would be logical to choose a point of time. For current employment series, this practice has been adopted in certain countries, but in most census studies a pay period is adopted chiefly for the convenience of the reporters. Although this practice raises the possibility of some double counting, it was endorsed by the Sixth Conference of Labour Statisticians who resolved that persons employed should "include all those who, in a specified period, perform some work, together with those who have a job but are temporarily absent from work". Usually, therefore, all persons who worked and received pay for any part of the period or were on paid sick leave or paid holidays, are included. In order to obtain an average for the year, similar statistics are often requested for separate weeks in the four quarters or the twelve months. In some other countries the "average number for the 12 months" is asked without indicating the method of calculation. Besides the annual average, statistics of personnel for a census week ending on a particular date are often collected in greater detail.

38. Since workers counted on the basis of a pay period may work for the whole or for only part of the period or for a varying number of hours per day, the figures may not be a correct measure of labour put in. Some countries require supplementary data on absence through vacation, sickness or for other reasons, and the number of persons on pension, but the most effective measure of labour put in is the number of man-hours worked. This is required in the most recent censuses of the United States and India, but the criteria of what constitutes a man-hour differ between these countries, and standardization of definition seems to be called for. However, actual man-hours worked is a difficult figure to obtain, especially in underdeveloped countries, and even in advanced countries
the figure available is usually hours paid and not hours actually worked. In other cases normal working hours per day or per shift and actual number of working days have been required.

39. The total number of workers as defined above is usually required to be analyzed. A basic breakdown often required is into salaried groups and wage-earning groups. Working proprietors of unincorporated establishments and active members of partnerships are either grouped into a separate category in contrast to employees or considered as one of the constituents of the salaried group. Their remuneration is usually included in total salaries, but in a few countries it is excluded even when the persons are included in the number of personnel. While the line of demarcation between salaried and wage-earning persons is not very clear and minor differences exist both in their scope and in the method of classification between different countries, it is generally understood that the distinction between these two groups rests on the nature of work rather than on the method of payment and that the wage-earning class usually includes manual workers up to the working foremen level. The "wage-earners" group is sometimes defined more directly in terms of the function, e.g. "operatives" or "production and related workers". The Seventh International Conference of Labour Statisticians requested the International Labour Office to prepare recommendations on standard international definitions of wage-earners, salaried employees, production workers, and on direct and indirect labour for use in labour productivity statistics. In the statistics of man-hours it is only the wage-earning class or the production workers that are taken into consideration.

40. Other breakdowns frequently required are by age and sex (these data are important, e.g. for productivity studies) and less frequently, by race, nationality, degree of skill, etc.

41. Countries which request information on payrolls may desire the data for the whole year of the census (e.g. South Africa) or for a specified period of that year (e.g. Chile). In some countries separate returns are given for salaries and wages. In addition some censuses require detailed breakdowns of total wages and salaries paid during a particular pay period designated in the census form (e.g. the week-end nearest 15 October). The figures of earnings
should clearly relate to the same body of persons as the numbers employed. The coverage required is normally the gross earnings, including overtime, bonuses, deduction for social insurance contributions, withheld tax payments and (the estimated value of) payments in kind. However, there are exceptions in regard to the latter (e.g., Great Britain) and the inclusion of family allowances depends on the organization of family allowance schemes in the various countries.

Chapter 6. Capital Resources

A. Total capital invested

42. Accurate data on capital invested are difficult to obtain, and experience in the field has been disappointing. Only a minority of censuses contain questions on this subject, and the treatment is far from uniform. Some countries including U.S. and Canada, after repeated attempts at collecting such data, have abandoned the attempt. Others, including New Zealand and South Africa, having tried to obtain data on total capital employed, now limit themselves to certain aspects only. On the other hand, there has been an awakening of interest in this question recently. India, Brazil and Colombia now include enquiries on capital and the U.K., which omitted the question for many years, added it in the most recent census.

43. The total figure required could be obtained either from the value of physical assets, or from the financial counterpart, paid-up capital, loan capital and reserves. The second alternative, which has been adopted by India and Brazil, has the following disadvantages:

(i) it includes cash and paper assets which need to be excluded but which cannot always be readily distinguished;

(ii) a breakdown into components such as buildings and machinery cannot be made;

(iii) there is little prospect of obtaining the data outside incorporated firms.

For these reasons the first alternative is usually preferred.

44. As indicated above, the purely financial assets are usually omitted, although New Zealand asks a question on cash, bills receivable and other operating accounts. Items that have been requested are land, buildings, plant and machinery, tools, vehicles, and stocks. The buildings to be included should be those which
are put to productive use, excluding dwellings and parts rented out. Vehicles are included only if the scope of the establishment includes the transportation department. The basis of counting is usually location, not ownership. For instance, the schedules of South Africa, Eire and the U.K. enquire about annual rental paid for hired assets, which figure can be capitalized in order to estimate the value of hired assets, while Brazil asks directly for the value of rented assets.

45. Some censuses are limited to questions on fixed capital, but in others data inventories and inventory on work in progress changes are collected, and in the U.S. census of 1947, for example, separate data were collected on stocks of finished products. Other possibilities are to separate out stocks of materials and work in progress. Data on stocks can be collected either by location, or as in U.S., by ownership, and since manufacturers frequently hold stocks away from their plants, e.g. in warehouses, the latter ensures a wider coverage.

46. Valuation of capital assets presents a peculiarly different problem. The value desired is the current market value but most capital assets are not subject to continuous market operations. A revaluation by the owner for census purposes would be too expensive to be seriously considered. Therefore, the values that are normally accepted, e.g. by the U.K., are those that are available because of bookkeeping and taxation practices, namely for real estate and buildings the rateable value of the tax authorities, for other fixed capital the original costs less depreciation, (normally but not necessarily depreciation as allowed by the tax authorities) and for inventories the taxable book value. This means that the significance of the figures and their international comparability is affected by the legislative provisions and accounting practices of the country. Also, the data can only be collected in countries where tax legislation is suitable and systematic accounting prevalent, and within these countries only for organized establishments. Nevertheless, such figures will serve as a convenient and frequently as the only starting point for a survey of the amount and distribution of physical assets.
B. Changes in capital assets (current investment)

47. A comparatively new development in industrial censuses is a question on expenditure during the year on capital assets. The figures are important for business cycle analyses and for measuring the extent of modernisation and re-equipment in different industries. The U.S. census of 1939, included a question on expenditures for permanent additions and major alterations changed to capital account, showing separately:

(i) buildings and other fixed plant and structures;
(ii) machinery and equipment;
(iii) land, used buildings and equipment.

Another item for possible separate treatment is vehicles. The U.K. census of 1948 asked similar questions, but in addition requested data on disposals, which are necessary to estimate the net change. For completeness it is necessary to know purchases of new assets separately from used (since the latter do not represent new expenditures of the community), outright purchases separated from rentals or hirings, and total expenditure on fixed assets separated from maintenance expenditure. Expenditures should include outlay for new capital items produced within the establishment as well as those bought. Another possibility is the separate listing of machinery purchased from abroad; this was suggested for the U.K. census. This has been carried out in the Danish censuses.

48. Questions on changes in stocks or stocks at the beginning and the end of the period have been asked in many censuses because they form a link between production, which is the data needed, and sales, which are easy to give. Changes in total stocks can only be measured in value, however (and are markedly affected by changes in market prices so that before correcting for price changes it is necessary to know the principles of stock valuation used). It is the practice, therefore, e.g., of the U.K., to supplement the value data by data on quantities of several important materials and commodities included in the total and to request a statement of the principles of inventory valuation used.

C. Types of industrial equipment

49. A census of machinery in physical terms would be very useful for measuring the degree of development of a country and the capacity of production, but owing to the great variety of types is very difficult to obtain. Occasionally,
though rarely, the attempt has been made. Thus the Egyptian census of 1937 re-
quired an itemized enumeration of all machinery by type, and so did the Brazilian
questionnaire of 1940. In other cases attempts have been made to get the most
important types, e.g. Sweden, Colombia (1945) and Germany (1907) - in the last
case the tabulations ran to 165 items and was admittedly incomplete. Though a
complete listing appears to be unobtainable in developed, the attempt may be
justified in underdeveloped countries with few industries and uncomplicated
machinery. If the question is included, the listing should not be left to the
establishment; instead the schedules varying from industry to industry should
specify the various types of machinery which should be returned.

50. Questions on particular types of standardized, easily-identifiable types of
plant are more frequent: examples are blast furnaces and cotton spindles.
Enquiries usually refer to capacity as well as number. In the Canadian census
of 1946 questions were included rolling mill equipment, blast furnaces, steel
furnaces, brass furnaces, hosiery machines, cotton spindles and looms, pulp and
paper machinery, baking ovens, oil refineries, and gas ovens. Greece, South
Africa, and the United States provide other examples, especially in the textile
field. In general, the question is likely to be unprofitable unless the
machinery in question has either a storage capacity or produces a relatively
uniform product in terms of which it can be given a "rated capacity". Under
this heading come questions on transport equipment operated by industry. A
coverage of all types was undertaken by Brazil in 1940 and Austria in 1930, and
selected types (e.g. automobiles, lorries) by Switzerland, U.S., and the
Netherlands and South Africa (1946).

D. Power equipment

51. One method of measuring mechanical equipment in physical terms is by means
of the amount of power it is able to produce or consume and questions on power
equipment have been asked in very many censuses. In recent years, however,
there has been a tendency to omit the question, e.g. the U.S. in 1947, U.K. in
1948 and India in 1946.

Usually separate questions are asked on prime movers, generators and motors,
the last divided into those run by power generated in the same plant and those
run by purchased power; and all types may be sub-divided into those ordinarily
in use and those in reserve.
53. In English-speaking countries generally it has been customary to list together - but not to add - the total horse-power of prime movers and the total horse-power of motors driven by electricity, the latter separated into motors driven by plant energy and motors driven by purchased energy, for instance the U.S., 1939. In some European countries (e.g. Italy, 1935-36) the prime movers are divided into those directly applied to mechanical devices and those used in driving generators; the total power installed is then arrived at by adding the horse-power of all motors, whether driven by self-generated power or purchased power; to the horse-power of prime movers directly applied to mechanical devices.

Chapter 7. The Enterprise

53. The scope of questions concerning the enterprise as distinct from the establishment is as follows:

(a) the legal form. This question appears on almost all schedules and permits enquiries into the role of corporate versus unincorporated business in industry.

(b) the age of the enterprise (India; Egypt 1937; Brazil; South Africa) which provides information for a study of industrial growth.

(c) Whether government-owned (Netherlands, Sweden).

(d) Whether foreign-controlled. This question is treated in most Latin American censuses (Colombia, Mexico, Argentine, Brazil) and in other under-developed countries (Egypt) and relates to the present and previous nationality or residence of owners, manager and board members; and to the nationality of stock holders.

(e) Concentration. The U.S. Census distinguishes between, and secures separate data on, independent and plural-unit (with central administrative office) organisations and asks also for information on possible control of the operating company by another company. In 1935 the U.K. distributed to selected groups a special questionnaire on the relationship between subsidiary and parent companies.
Chapter 8. Frequency of Censuses

54. There is great variation in the frequency with which censuses are taken. A few countries, e.g. Colombia (1945) have only recently taken their first census. Among countries with a sequence of several censuses, three groups can be observed:

(a) A few countries take censuses every year, e.g. Canada, New Zealand, the Netherlands and Denmark. The U.K. will be in this group henceforth.
(b) Other countries take censuses periodically but at intervals less frequent than one year; for instance, the U.S., which formerly took censuses every two years and now every five years.
(c) Yet other countries take censuses at irregular intervals, e.g. Germany which took censuses in 1879, 1882, 1895, 1907, 1925, 1933 and (in different form) 1936; Egypt, 1927, 1937 and 1944.