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STATISTICAL NEWS

Developments in British Official Statistics

Note by the Editor

The aim of *Statistical News* is to provide a comprehensive account of current developments in British official statistics and to help all those who use or would like to use official statistics.

It appears quarterly and every issue contains two or more articles each dealing with a subject in depth. Shorter notes give news of the latest developments in many fields, including international statistics. Some reference is made to other work which, though not carried on by government organisations, is closely related to official statistics. Appointments and other changes in the Government Statistical Service are also given.

A full, cumulative index provides a permanent and comprehensive guide to developments in all areas of official statistics.

It is hoped that *Statistical News* will be of service and interest not only to professional statisticians but to everybody who uses statistics. The Editor would therefore be very glad to receive comments from readers on the adequacy of its scope, coverage or treatment of topics and their suggestions for improvement.

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Statistical News No. 4

Developments in British official statistics

LONDON
HER MAJESTY'S STATIONERY OFFICE

Contents

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Statistical and business research in the Post Office

S. Wood
Director of Statistics and Business Research Department, Post Office

The Post Office as a business

Up to the early 1930's the Post Office was treated as a normal Revenue Department of Government. Expenditure was voted and income was automatically paid into the Exchequer. But in 1933, as a result of a report by a Committee of Enquiry into the Post Office (the Bridgeman Committee) a limited contribution to the Exchequer was fixed beyond which any net savings were at the disposal of the Post Office. These arrangements were suspended during the war, but in 1961, after several years' experience of them since their re-introduction [1], the commercial character of the Post Office was recognised by Parliament in statutory terms by establishing a new Post Office Fund and placing it under the management and control of the Postmaster General [2] [3]. For many years, therefore, the Post Office has been functioning mainly as a commercial organisation, 'in effect, although not in law [4]' as a nationalised industry, and in 1966 the Government announced its decision to change the legal status of the Post Office and to create a public corporation to run the postal, telecommunications, data processing, remittance and other services (including the new Giro service) 'with a structure and methods designed directly to meet their needs, drawing on the best modern practice [5]'. A Bill to establish this Corporation has been introduced in the present session and if it is passed, the Corporation is expected to start to operate in 1969.

Post Office statistics

The stated purpose of *Statistical News* [6] is to provide regular information on what is going on in government statistics and thus to be a key link between the producers and consumers of statistics. As an immense national trading organisation the Post Office is both a producer and a consumer in the above context. The constituent businesses produce their own statistics primarily as an aid to the efficient running of their respective services, but because their operations play a vital part in the economic and social life of the nation these business statistics are also of importance 'to the business community, to trade unions, to social scientists, and indeed to the public at large [6].' A note on the main published sources for Post Office statistics is included at the end of this article. And as a consumer of statistics, the Post Office makes very considerable use of central government economic and social statistics.

Statistics and Business Research Department

In the Post Office a consultancy group, the Statistics and Business Research Department, provides an advisory and research service for both producers and consumers of statistics in the separate Post Office businesses and in the Central Headquarters of which this Department itself forms part.

The Department is centralised because it is considered that one such consultancy group, with the present professional complement of two dozen posts in the statistician/economist/scientific officer classes, operates more efficiently than would smaller separate groups for each sector of the Post Office, under the essential condition that liaison between that group and the client departments is close and virtually continuous, with a constant two-way exchange of problem-projects, and with provision for out-stationing in the way described in the final section of this article.

The group's functions may be sub-classified under the five headings statistical research, economics and econometric research, market research, operational research, and manpower research which correspond to the respective spheres of responsibility of individual sectors within the group.

Statistical research

The statistics service is not concerned with the routine collection and processing of data, responsibility for which is vested in operational departments within the businesses, but it gives guidance on statistical methods and on the interpretation of results. A large part of its effort is concerned with pioneering new ways of obtaining statistics by sampling, and in the course of this it may carry out experimental schemes or pilot studies to the stage at which they can be handed over to the operational departments as routine work.

Most facets of Post Office activity come within the ambit of this service – statistical problems arising in such diverse fields as postal, telephone and motor transport operations, accommodation, welfare, health and safety services.

For the postal business, statistical research is, for example, continuously concerned with the development of improved ways of estimating the quantity of letter traffic at the various stages of its handling. Detailed short-term statistics are required of the number of incoming, transit and delivered letters at Head Post Offices in order to measure and improve manpower productivity. Other statistics are needed on a regional or national basis for costing purposes and more general productivity and planning studies.

Wherever mechanisation of the postal processes provides facilities, direct measurement by counting is employed; but more commonly traffic quantities have to be estimated by sampling since continuous manual counting is of course too expensive to be used. Letter traffic is difficult to estimate accurately on a short-term basis because it is subject to substantial day to day and hour to hour variations, which are for practical purposes unpredictable, and long-term averages are often of limited use in estimating volumes in a particular period. These variations also complicate the process of selecting unbiased samples. Moreover the characteristics most readily studied, such as weight, volume and thickness, tend to introduce wide errors when used as a basis for estimating numbers of letters unless large samples are used.

A good deal of the basic counting and measuring has to be carried out by postmen or their immediate supervisors, which means that much attention has to be given to the creation of a robust, readily understood scheme which will not be subject to serious errors of execution. Also the sampling unit must be small enough to be manageable without delaying the dispatch or delivery of mail.

Whilst some multivariate analysis and simulation studies are performed for the telecommunications business, most of the work is in applying sampling techniques. Occasionally it is found necessary to make use of a fairly complex design, but the main effort is to improve reliability and to block potential sources of bias. Every year, for instance, much care is taken to renovate a special sampling frame of exchange connexions to be used, for example, in the selection of subscribers for the types of survey mentioned below, in the Market Research section. Sampling telephone traffic is more difficult: for operator-controlled trunk calls there is at least the telephone ticket to sample, but STD (subscriber trunk dialling) calls have no such physical embodiment, and these are now by far the larger category of trunk calls. So trunk call sampling equipment, admitting variable sampling fractions to match the changes in traffic level during the day, has been developed to sample automatically and to punch results directly on to tape for computer input.

Economics and econometric research

A general economic advisory service is maintained, involving the study of the 'domestic economy' of the Post Office and also environmental forecasting. As an example of the former, the application to Post Office projects of investment appraisal methods has been studied: discounting procedures have been illustrated by mathematical, electrical and mechanical models which demonstrate the advantages and limitations of various techniques. Environmental forecasts circulate throughout the Post Office by means of a quarterly broadsheet which contains descriptions and appreciations of current trends, and forecasts of short and medium-term developments in the most relevant economic aggregates. There is particular interest in general cost and price trends, and in fluctuations in the demand for labour which have a marked effect on Post Office recruitment.

The service includes the supply of the macro-economic and other variables used in the econometric research projects, that is, in the construction of models for various aspects of Post Office business. The Prices and Incomes Board, in their report on the Post Office [7], emphasised the importance of this work, in the context of demand forecasting, by specifically recommending its expansion within the Statistics and Business Research Department; and in fact econometric research here has largely been concentrated to date upon the estimation of demand functions for the main Post Office services.

The demand for residential telephone connexions and the demand for trunk calls have been given priority, as these are the fastest growing services and the main determinants of the heavy programme of investment. Studies have also been made of business telephone demand, local calls, and postal correspondence (letter traffic). The research has involved time series analysis using standard regression techniques to estimate price and income elasticities.

The technical problems encountered were those common to all multiple regression analysis using time series data, i.e. multicollinearity and serially correlated residuals. Normally these were satisfactorily dealt with by analysing percentage changes in the variables rather than the actual values. In the demand models for telephone connexions there was a further complication in the evident delay between the stimulus to and the response by customers: this required the introduction of lagged variables – in practice these were five year exponentially weighted totals. In the case of trunk traffic, a technical progress variable had to be included to take account of the impact of STD (subscriber trunk dialling) which over the last few years has given a very important stimulus to the annual rate of growth.

The sets of forecasts derived from several of the models so far constructed (and continually up-dated) are important factors in determining Post Office investment plans. The models also enable quick estimates to be made of the repercussions of alternative tariff policies upon demand and revenue. The scope of this econometric research is currently being broadened by the development of a telecommunications finance model in which supply as well as demand variables will be introduced as joint determinants of financial outcome.

Market research (including public opinion surveys)

Within each of the four main areas of Post Office business (postal, telecommunications, data processing and Giro) there are now market research groups to provide information for marketing decisions. These market research responsibilities are carried out mainly by non-professional staff, and it is the function of the market research sector of the Statistics and Business Research Department to provide professional advice and to undertake special research, the latter of which at present also involves some executive responsibilities.

At any one time the Post Office is likely to have about one hundred market research projects in progress from the early planning stage through to the final stage of interpretation and action. These projects include opinion surveys, motivational research, advertising research, and demand studies for new or developing services, among many other types of market research applications.

When providing professional advice in these market research applications it is customary to cover the whole gamut, from initial survey-planning to sampling design, selection and weighting, and so on all the way through to the final analysis and report, because almost every survey presents special problems at each of these stages, and because, even with the simplest project, advice must be extensive in order to ensure that all parts of the survey fit together smoothly and consistently.

Some of the surveys are undertaken by outside contractors, and the Department's market research sector has the task of evaluating performance as a guide for future assignments of each type.

One large-scale continuous survey involves both research and executive functions for the central market research sector. This is known as the Residential Research Sample, and it comprises a random sample of subscribers continuously augmented by new subscribers. Data for all these subscribers are being obtained partly by means of market research (for socio-economic factors and family usage of the telephone) and partly through the flow of Post Office records of accounts, additions to installations, and the like. Each subscriber will remain a member of this panel for several years, and hence time-series as well as cross-sectional material will be available for telephone forecasting and for marketing and general policy decisions. Parallel series of continuous surveys are being planned for business subscribers; for the one million small-scale business telephone customers the sample has been selected and internal data are already being accumulated.

Operational research

The activities of the operational research service are diverse, but broadly cover problems of design of a wide variety of types of transportation network so as to achieve specified service objectives at minimum cost. There is only space here to illustrate this work by means of a couple of examples, one relating to Post Office supplies and one to the Postal business, thus regrettably omitting a description of any of the main telecommunications systems problems.

The value of stores obtained by the Post Office from contractors and distributed to its field users approaches £100 million a year and it is of greatest importance that purchasing and supply operations should be carried out according to explicit service objectives. The work area is large, and two fields of it only are mentioned here. One is concerned with the location and organisation of points at which stocks are held (roughly 'depots') and with the transport arrangements interconnecting these points and the field users. This is 'distribution'. The second is concerned broadly with the control and replenishment of holdings at the stock points so as to meet a specified service objective. This is 'provisioning': it embraces the design of control techniques applicable to classes of distribution systems, and it is here that the limited amount of available professional effort has been largely concentrated. The first problem has been the design and installation (in conjunction with the Post Office Purchasing and Supplies Division and the National Data Processing Service) of a central data-processing system with the necessary control facilities. This system will provide central processing of various kinds, e.g. demands from field users, issue orders to stock points, maintenance of central running records of holdings at stock points, forecasting of future demand, signals for arranging new contracts, generation of orders on contractors against existing contracts, and specification of the stock-points to which the resulting stores are to be sent. Parts of this system are now in use. There will be scope, after the system is completely operational, for progressive refinement of its forecasting and control techniques and of performance measures, and for the exploration of the relationships between service objectives and system costs. (The contribution of the central department to supplies and associated work is one of the widening fields of work referred to in the final section of this article.)

A Postal example involving recent operational research is the study of 'sorting'. In any postal system the average number of sorting handlings received by an item of mail depends on the number of delivery addresses, the relative freqeuency of items to these addresses, and the 'circulation rules governing' the dispatch of items between the various sorting offices. It is necessary to minimise the average number of sorting handlings subject to any constraints imposed by transport and other non-sorting costs. Work on this problem has produced some new results and techniques based on information – theory concepts. This work is one part of a larger programme which may lead to the development of a postal system model (including collection and delivery and internal office work scheduling as well as circulation and sorting). Such a model would not only be a useful tool for the improvement of system design techniques; if constructed in association with relevant econometric models it could also throw light on problems of costing and tariff-setting.

Manpower research

A new department has been set up to study future Post Office manpower resources. The initial task is to build a computer record, including staff histories, as a data bank to replace the Post Office part of the existing Civil Service Central Staff Record. Preliminary studies are starting on calculating life tables for groups of staff linked with promotion probabilities into and out of the group. From this should emerge, for key forward dates, estimates of the numbers expected to be available in the group, their age, sex and other characteristics. At a later stage data from staff annual reports will be incorporated to improve the accuracy of promotion forecasts.

The manpower supply forecasts so obtained will be compared with the manpower requirements based on forecasts of work to be done. Discrepancies so revealed will call for:

- re-examination of recruitment plans (in consultation with the Department of Employment and Productivity);
- re-assessment of promotion attributes and recalculation therefore of promotion possibilities;
- in the last resort, changes in Post Office policy.

Future developments in statistical and business research

One of the main recommendations in the Prices and Incomes Board 1968 Report on Post Office charges [(7)], was that 'the Post Office . . . should set up a team of engineers, statisticians, economists, operational researchers and cost accountants to undertake the necessary work in order to identify the structure of long run marginal costs'.

Such projects involve the out-stationing of statisticians and economists from the Statistics and Business Research Department which, however, remains their home territory with all the advantages that this provides for professional supervision, professional contacts and career management.

Under corporation status the Post Office will almost certainly continue to increase its deployment of these business research teams for specific projects, some of which take two or three years to complete, whilst some (for example stores supply, which covers an ever-widening field and for which a new Chief Statistician post has recently been authorised) are of a quasi-permanent character.

And within the central consultancy group the requirements for economic, statistical and operational research as tools for business decision-taking will involve for the foreseeable future a steadily increasing load of advisory research assignments in all the sectors of the Department.

Main published sources for Post Office statistics

The annual Post Office Report and Accounts contains statistics of supply, demand, receipts and expenditure for the separate Post Office businesses. The latest report, for 1967–68, is published by HMSO, price 16s. 6d. net. A digest of these Report statistics is included in the *Annual Abstract of Statistics* (HMSO).

A comprehensive annual series of Post Office telecommunications statistics (the 'Orange Book', ref. MSD/MS3, Post Office Headquarters, London, E.C.1) is available in many University and other libraries.

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(2) *The Status of the Post Office*, Cmnd. 989, 1960.
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(4) First Report from the Select Committee on Nationalised Industries – *The Post Office Vol. I*, H.C. 340, 1967.
(5) *Reorganisation of the Post Office*, Cmnd. 3233, March 1967.
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The Central Register of Businesses

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One of the most ambitious tasks which the Government Statistical Service has set itself is the creation of a Central Register of business establishments and other reporting and accounting units, for use by all Government Departments in their statistical inquiries. The Central Register (previously referred to as the 'Common Register') is basically an agreed list of names and addresses of businesses, which will be held on a computer, classified by industrial activity, location, size and so on, and its creation and maintenance is one of the major tasks of the new Business Statistics Office. (See page 4.41 of this issue.)

A description of the purpose of the Central Register was included in an article by Mr. J. Stafford (Director of Statistics, Board of Trade) in the first issue of *Statistical News*. The present article describes in rather more detail the form and content of the Register as at present envisaged, the uses to which it will be put and problems which will need to be resolved to bring it into operation. Some discussions about these matters have taken place with individual firms and trade associations. The purpose of this article is to make more people aware of the work which has been planned and on which a start has been made. Representatives of industry and commerce will be consulted by Departments as the work develops and progress reports will be published from time to time in *Statistical News*.

Under present arrangements individual departments compile and maintain their own registers and, although the definitions and classifications used are generally basically the same, in practice it can never be certain that business establishments and firms are identified and classified in precisely the same way in the various published statistical series. For example, the monthly and quarterly figures of output and employment, which are compiled by different departments, are not comparable in coverage. Similarly, with independently constructed registers for different inquiries, it is not possible to ensure that statistics of output for different industries are mutually consistent.

Objectives

The Central Register is intended to be more than merely a list of names and addresses of businesses classified in one way or another. As it develops it will become a much more sophisticated tool than this Eventually, its functions will be:

(*a*) To provide an up-to-date list of names and addresses of statistical reporting and other business units. classified by industry, area and size for use by all Departments in their statistical inquiries.

(*b*) To provide a frame for the choosing of samples and when required, to enable the Business Statistics Office to act as a central agency for addressing forms, sending out reminders, marking in returns and other such operations.

(*c*) To enable statistics on different subjects to be properly related to form an integrated system of business statistics. The Register will provide an index, or 'key', to the main statistical data held by the Business Statistics Office and by other Government Departments. It will provide the means for bringing together on a systematic and consistent basis statistics on different subjects, including those collected from different levels of reporting units (e.g. the 'establishment', and the 'business unit') within the superstructure of a business enterprise.

(*d*) To avoid overlap and duplication in the collection of information and to prevent the omission of information. The Central Register will provide an instrument for eliminating the duplication which can occur when inquiries are based on different registers and are directed towards different objectives.

(*e*) To provide in itself a data bank for analytical purposes. (A data bank provides a means for organising and storing and making readily accessible a large volume of statistical data.)

The register will clearly be of great commercial value; indeed there have been many requests for lists of firms or establishments classified by industry or location for market research and other purposes. It is hoped that there will be general agreement on the usefulness of a wider dissemination of lists of names and addresses of establishments, together with their industrial classification, and perhaps also with some indication of their size. To test the reaction of industry to this suggestion, firms are being asked in the forms used for the Census of Production for 1968 to agree to the inclusion of their names and addresses in the classified lists of businesses which the Board of Trade propose to compile and publish. The Board of Trade have already secured agreement to the publication as supplements to *Business Monitors* lists of names of firms contributing to some individual production series.

It will be big step forward from the present position to have reasonably up-to-date figures of the numbers of establishments classified by size group, industry and area. These will provide valuable 'control data' for market research and other purposes.

The Central Register, as now envisaged, will eventually provide the frame for the development of a data bank, or system of data banks, in which business statistics can be related, stored and, subject to the safeguarding of confidential information, made available to industry and commerce as well as to Government Departments. This envisages a completely new type of information system than exists at present.

The size of the problem

It is recognised that these objectives will be achieved only gradually because of the very large number of statistical reporting units involved and lack of information about them and because of limitations on resources. There are over 100,000 establishments in manufacturing industry, over 100,000 firms in the construction industry, around 600,000 shops in retail distribution and something like two or three hundred thousand businesses in the motoring and catering trades. All in all, there are probably more than two million non-farm business establishments in the United Kingdom.

Building up a Central Register for all these units is a very considerable undertaking and will take a good deal of time to complete. Existing methods of compiling departmental registers go back a long way and to achieve an agreed register may mean, in some cases, abandoning existing procedures. In a number of cases, registers have not been continuously maintained but have been constructed, or reconstructed, from time to time for the taking of major inquiries such as the census of distribution. Regular updating of such registers presents a big problem. In some cases, registers may need to be reconciled and this can be a formidable undertaking not only because the numbers involved may be large, but also because different reporting units are used in different inquiries. A reconciliation between the registers for manufacturing industry of the Department of Employment and Productivity and of the Board of Trade is now well advanced. The Department of Employment and Productivity is particularly interested in statistics compiled from the smallest units for which employment data are available (the 'local unit'), whereas the Board of Trade in their production inquiries take as the basic unit the smallest one for which a fairly wide range of information can be obtained (the 'establishment'). A fundamental problem is to identify the establishment and classify it to the appropriate industry. This can only be done when some details are available about the establishment's sales. The Central Register for the manufacturing industries is being kept up-to-date mainly from information provided by the Department of Employment and Productivity's local offices and from new company registrations. The results of the Census of Production for 1968, when they become available, will provide a check on the Register which has been built up. New quarterly production surveys are planned and when these get under way, they also will provide an important source for classifying establishments. For the industries outside manufacturing, the problem of building up and maintaining a Central Register is more difficult because of the very large numbers involved, and because 'births' and 'deaths' are much more common. Various schemes are being considered to do this during the early 1970's. A key date here is that under present plans the next full Census of Distribution will take place in respect of the year 1971.

The statistical units

Because the Central Register is intended to be used in all types of statistical inquiries and will provide the key to an integrated system of business statistics, it will need to contain data relating to all the different statistical units used for analytical purposes. These units are (*a*) the local unit, (*b*) the establishment, (*c*) the company, (*d*) the business unit and (*e*) the enterprise, all of which represent different tiers in the structure of a business enterprise.

The *establishment* is the traditional unit used in the census of production and is the statistical unit being used in the new quarterly production inquiries. Typically it embraces all the activities carried on at a single address e.g. at a mine, factory or warehouse. In most cases one main activity is carried out at one place. But in a number of cases distinct activities characteristic of different industries are carried on at one location e.g. cotton weaving and the making up of household textiles. If these separate activities are conducted as separate businesses, for each of which the required range of data normally required for a production inquiry can be provided (e.g. employment, turnover, stockbuilding, etc.), each is taken to constitute a separate establishment. Ancillary activities carried on as a separate business at a single address would be treated similarly.

In some cases a single business activity is carried on at a number of different locations. If the business is able to provide the full range of information required for each separate location, each is treated as an establishment. However, if the business is able to provide only a limited amount of data about each separate unit (e.g. data on employment, wages and salaries, but not details of deliveries at each location) the business will be regarded as one establishment for statistical purposes, but the *local units* of the establishment will be separately identified in the register. The information available about these local units will be required for providing a detailed geographical analysis of employment data.

The *company* is a legal unit as opposed to a statistical reporting unit. Broadly speaking, it represents one or more establishments under the same ownership which constitute the legal entity for tax purposes. The *enterprise* is a broader unit. Typically it is a group of companies required under the Companies Act to file consolidated accounts. In many cases the company and the enterprise are identical. Similarly, if a company has only one establishment, the company and the establishment are identical. For the majority of entries on the Register the local unit, establishment, company and enterprise will be identical.

The *business unit*, like the establishment, has no legal basis and no unique definition. It is a convenient statistical reporting unit. It is related to the management structure of the enterprise and is identified because it is the most convenient reporting unit for obtaining speedily, certain information flowing from management records. It may be the establishment or it may be the whole enterprise, but between these two extremes it is any grouping of companies or establishments within the enterprise for which the information required can readily be supplied. For example, statistics on capital expenditure, stockbuilding and orders on hand are collected either monthly or quarterly from business units. Often the business unit operates wholly within a single industry but, like the enterprise, the business unit often operates in a group of related industries, and not infrequently operates establishments both in the manufacturing and in the distributive and service trades. For business units to constitute a separate tier in the structure of the Register, they will need to be defined in terms of their constituent establishments. Otherwise, it will not be possible to use the Register for relating statistics collected from business units to those collected from other units.

A most important problem in constructing the Register will be to devise a system which will enable the information for these different levels of reporting units to be related. It is simple enough to construct a system which can, as it were, operate upwards to provide the name and address and description of the business unit or enterprise to which each establishment belongs. On the other hand, a more sophisticated system is required to enable the Register to work downwards to bring together details of the establishments owned by a business unit or enterprise without enlarging the size of the Central Register out of all proportion. The enterprise in question may own several hundred different establishments operating in widely different industries and areas. The initial design of the file structure of the Central Register is extremely important and a considerable amount of attention is being devoted to this. The ideal to be aimed at would allow both upward and downward referencing within the register and would enable entry to be made at any tier within the hierarchy consistent with the minimum use of storage facilities.

The contents of the Register

Some information about each of these various statistical units will need to be included on the Central Register. But the fullest information to be included will be in respect of *establishments*. The following paragraphs describe the present thinking on this section of the Register.

Reference number of the establishment. This number will be unique to the establishment and if possible will be used in all inquiries and for all data input and output purposes. The reference number would last for the whole lifetime of the establishment. The GPO GIRO coding system has been suggested as a possible number but this has disadvantages. An establishment may have more than one GIRO account, several establishments of the same company may use the same code number and not every firm will have a GIRO account. Another possibility would be to use the GPO postal code. But this is not necessarily unique to the establishment. We think that the reference number should not include an indicator of industry as this may have to be changed from time to time. It may be that the reference number can be so derived as to provide the means for moving up and down the hierarchy, and since the exact form of the reference number is so important this is being investigated.

Name and address of establishment. This could include the postal code. The name and address of the reporting unit, if different from the establishment will also be shown on the Register.

Local units. An indicator will be included on the Register to show whether the establishment has local units. Figures of employment for local units would permit a particularly fine geographical analysis of employment statistics to be made. For this reason, the Register of establishments will need to provide a key to the local unit tier of the register.

Geographical location. There are a number of possible systems of area classification that could be used in the Central Register. These include the employment exchange areas of the Department of Employment and Productivity (there are nearly 1,000 such areas in Great Britain); local authority areas; areas based on the GPO postal code; the 100 square metre National Grid; and the co-ordinate referencing system.

The *employment exchange areas* are used in the registers of manufacturing establishments maintained both by the Department of Employment and Productivity and by the Board of Trade. *Local authority areas* however, are used by some other departments and have been used by the Board of Trade as the basic unit in the census of distribution. The employment exchange areas do not necessarily correspond to local authority areas but they can be aggregated readily into standard regions and their sub-divisions and, where appropriate, into Development Areas. Employment exchange areas are used in legislation to define Development Areas and areas to which special provisions relating to Selective Employment Tax apply. Although relatively permanent they are subject to changes from time to time as changes are made in the area organisation of the employment exchange service, for example, when new towns and other centres of employment develop. Their main disadvantage is that they are not sufficiently small and homogeneous to form an ideal basic unit for building up into non-standard areas or for studies of small areas. For example, in the census of distribution the Board of Trade specially identify areas such as local shopping centres.

In spite of these limitations, the employment exchange area is preferable to any numbering system based on local authority areas. Furthermore, the Board of Trade and the Department of Employment and Productivity would face considerable costs if they converted their current geographical classification on to one based on local authority areas and it would certainly give rise to serious administrative problems. The employment exchange area code will be used as a unit in the Central Register.

Consideration has also been given to using the *National Grid* as an area coding system. This provides a uniform and stable system for locating any point in the country in terms of its distance east and north of a basic point south west of the British Isles. Any point or area can thus be given a unique reference which defines its position relative to all other points. Points and areas can be defined to a chosen level of accuracy. For example, four characters easting and four northing represent an accuracy of 100 metres; or to put it another way, an eight digit number can locate an area of 100 metres square. Consideration is at present being given to the inclusion of the 100 metre grid square reference when the census of population is taken in April 1971. However, these units would not satisfy the needs of all possible users of the Central Register who may be concerned with local authority areas or shopping centres of irregular shapes and sizes. For this reason the *co-ordinate referencing system* is being considered. This, by using a twelve digit grid reference (six easting, six northing) pin points an area one metre square. A co-ordinate referencing system offers a flexible and powerful method of area coding and its possibilities are being explored within the government service.

For the time being the employment exchange area will provide the basic area code in the register but eventually, either the national grid or the co-ordinate referencing system, or possibly both, may be incorporated. Costs and benefits will need to be worked out carefully.

Industrial classification. It is proposed that the industry classification of the establishment should be at least at the minimum list heading level of the *Standard Industrial Classification 1968* with sub-divisions. Local units would carry both the industry classification of their parent establishment and their own finer classification but the business units and the financial units would necessarily be classified by broader industry groups. The classification of a manufacturing establishment would be based on a previous full year's operation as recorded in a production inquiry; in other industries classification would be based on the latest available information.

Type of establishment. The register will probably carry an indicator showing whether the establishment is trading as direct sales, mail order, self-service, etc.

Relationship in the hierarchy. The register will need to provide an indicator of the reference number of the enterprise, of the company and of the business unit to which the establishment belongs. This is necessary to bring together information collected about the establishment at the business unit and at the financial unit levels. The register will provide the key, or the index, for this to be done. As has been indicated already, how this is to be done is being investigated.

Size groups of establishments. Establishments can be classified by size group *inter alia* in terms of (*a*) employment; (*b*) turnover; and (*c*) net output. It is thought that size indicators for all these three characteristics should be included on the Register for establishments classified to manufacturing industries, but only the first two for other industries. The Central Register itself would not give precise details of the numbers employed or of the gross output and net output. References to the associated main data bank which eventually will be developed at the Business Statistics Office would provide precise figures of these items for each establishment. There may well also be subsidiary data banks carrying for example, further details of employment for each establishment giving an analysis for age, sex and so on.

Other reporting units

The information included on the Register in respect of local units, business units and companies would not need to be as full as that for establishments. The register in respect of these units would need to include as appropriate information about addresses, industry classification, geographical location and size and cross references to relate the different levels of reporting units to one another.

The design of the Register

The design of the Central Register must take account of the ultimate objectives of the Business Statistics Office, that is to collect, store, process and, subject to the need to safeguard confidential information, disseminate the main government statistics relating to businesses. The Central Register will provide the basis for this to be done efficiently. The total number of characters required to make up the final form of the Central Register for all non-farm businesses might be of the order of two thousand million characters. Because of its potential size, the Register may need to be recorded as two or even three direct access files, each of which would need to be deposited periodically on to magnetic tape. Under this arrangement each file would be used for different purposes. For example, one might be used exclusively for addressing purposes, another might be designed for quick and ready access to information and for on line enquiries, and another might be used exclusively to provide a basis for the batch processing work of the Business Statistics Office. But all this is conjectural.

The dissemination of information from the Register and its associated data banks will need to be governed by considerations of confidentiality of data, priorities and costs and benefits. The Computer and Data Systems Unit of the Central Statistical Office, in collaboration with the Business Statistics Office is beginning to work on these problems.

Other countries' experience

Other countries are moving in the same direction on this topic. It may not be widely known in the United Kingdom that the United States Bureau of the Budget has designated the Bureau of the Census as the agency responsible for the development and establishment and operation of an industrial directory on behalf of Federal statistical agencies. In a letter dated October 1st, 1968 addressed to the Director of the Bureau of the Census, (quoted in the October 1968 issue of the *Statistical Reporter*) the Assistant Director for Statistical Standards, Bureau of the Budget stated 'The planning of the industrial directory should deal with questions of directory coverage, sources, and content information, such as nature of identification, address, industrial activity classification, and feasible measure of size at various levels of organisational detail within each company. The directory information should be planned to include not only names but various identification numbers to provide for routine recognition of the affiliation among parent companies, subsidiary firms, and their establishments, throughout the entire business sector. The directory should be so designed as to be economically usable by Federal statistical agencies as the source for classification by industry of establishments and enterprises and for the selection of appropriate industry samples.'

Public expenditure statistics

P. M. Rees, *Chief Statistician, H.M. Treasury*

The Plowden Committee Report

Before the beginning of the present decade, interest in public expenditure matters largely centred on the annual Estimates of Supply expenditure, that is the amounts which Parliament is required to vote annually to support the activities of the central government (see Appendix on page 4.14). These Estimates relate to the expected cash disbursements of the departments of central government, extend over a period only one year ahead and are arranged according to the Votes in which expenditure is grouped for purposes of departmental control and parliamentary accountability. The report of the Plowden Committee on the control of public expenditure, published in July 1961 (1), led to a radical change in the approach to public expenditure and the methods of planning and controlling it. The recommendation of this Committee most relevant to the subject matter of this article was that 'regular surveys should be made of public expenditure as a whole, over a period of years ahead, and in relation to prospective resources; decisions involving substantial future expenditure should be taken in the light of these surveys'.

The implications of this recommendation, as compared with the previous position, for public expenditure planning and control and the statistical base on which this must rest may be summarised thus:

(*a*) the whole of public expenditure, including outlays by the national insurance funds, local authorities and the capital expenditure of public corporations, would be brought under review, and not merely that part of central government expenditure which has to be voted annually by Parliament;

(*b*) estimates of expenditure thus defined would be made for a period extending 5 years ahead instead of the one year immediately ahead covered by the Supply Estimates;

(*c*) decisions on the level and pattern of public expenditure would be taken in relation to their demand on resources and not in the context of the expected cash flow;

(*d*) decisions on public expenditure would be based on information collected in annual surveys related to the requirements of (*a*) to (*c*).

The first of the surveys recommended by the Plowden Committee was undertaken in 1961 and since then surveys have been carried out each year. Over the course of the past seven years not only have these surveys been progressively extended both in scope and content but the administrative techniques for assessing their results and translating them into terms suitable for political decisions have been steadily refined. Some account of these techniques was given in *Public Expenditure: Planning and Control* (Cmnd. 2915) published in February 1966. This article is concerned essentially with the statistical apparatus serving the public expenditure surveys and touches on the administrative aspects of these operations only in so far as they help to explain the organisation of the statistics.

Public expenditure and economic management

The central feature of the present approach to public expenditure is that decisions on the level of such expenditure should be taken with reference to the total availability of national resources or output and claims on these resources from the private sector and exports. This implies that the Treasury's role in the handling of public expenditure, in conjunction with the spending departments and with the Department of Economic Affairs in relation to medium-term economic growth, is essentially that of managing the public sector as part of the management of the economy as a whole. The importance of public sector expenditure in this context may be gauged from the fact that in 1967 total outlays of the public sector amounted to some £17½ thousand million, equivalent in size to 51 per cent of gross national product at factor cost.

For the purpose of this operation it is necessary to consider not only public outlays which make a direct demand on resources, i.e. expenditure on goods and services (current and capital), but also transfer payments of various kinds which have the effect of transferring claims on resources to other spenders. All these expenditures are linked by three common strands. First, all are decided by government (central and local) or government-owned bodies. Secondly, they generally involve directly or indirectly a claim on the nation's productive resources. Thirdly, these expenditures are for the most part paid for either by taxes and contributions or by borrowing from the public.

Definition of public expenditure

The national income accounts provide the framework for measuring the progress of the economy as a whole and of its component parts and form the starting point for projections of the future level of economic activity in the short and medium-term. Since public expenditure directly or indirectly represents such a large claim on the output of the economy and is a powerful instrument by which the government can influence economic development, it is essential that when it is looked at in relation to available resources it should be measured in accordance with the principles and definitions used in the national accounts. Accordingly public expenditure in its widest sense is defined as the current and capital outlays of the central government (including the national insurance funds) and of local authorities, together with the capital expenditure and debt interest of the nationalised industries and other public corporations (mainly New Towns). All transfers within the public sector, such as central government grants and loans to local authorities and public corporations, are eliminated.

For planning and control purposes public expenditure is defined with a more limited coverage. Debt interest is excluded because it is a function of other expenditure, largely in the past, and is not subject to independent control as a programme; forecasting the future level of such payments also involves assumptions about the future levels of taxation and borrowing. Since 1965 the capital expenditure of the nationalised industries has also been excluded from the control total on the grounds that these industries are essentially enterprises producing goods and services for sale, and the size and composition of their investment have been considered in relation to the industrial needs of the economy and the financial obligations laid on the undertakings. Thus the present expenditure targets for 1968–69 and 1969–70 implied by the figures in the Prime Minister's statement on public expenditure in January 1968 (2), like similar targets under earlier plans, refer to the total of public expenditure excluding debt interest and the capital expenditure of the nationalised industries, etc.†

Analyses required for expenditure planning and control

In taking decisions on public expenditure Ministers have to consider not only the total of such expenditure in relation to resources but also its composition in terms of economic and social needs and their views as to priorities. For this latter purpose public expenditure is broken down, not in terms of Votes or departmental responsibilities, but according to functions or policy objectives e.g. defence, roads, education, social security and so on. This analysis by function lies at the heart of the present planning and control arrangements and expenditure on each function covers all outlays irrespective of the authority (central government, local authority, public corporation) actually incurring the outlay. The functional framework within which decisions are taken has altered in detail over the period during which surveys have been conducted, but is broadly reflected in the classification given in the table 'Treasury analysis of public expenditure' at the end of the Blue Book on National Income and Expenditure. The reasons for the divergence of that classification from the one used in the calendar year analysis of public expenditure (Table 53 of the 1968 Blue Book), which is compiled primarily for analytical purposes, are explained in *National Accounts Statistics: Sources and Methods* (3), pages 355–6.

Not all public expenditure outlays have the same economic impact. Expenditure on goods and services, for example, has a very much greater effect in terms of the demand it makes on real resources than does expenditure on the purchase of financial assets, such as company securities, or existing physical assets such as land and existing buildings. In between there is a variety of expenditures, mainly transfer payments such as social security benefits and subsidies, which have an intermediate effect in terms of resource absorption, depending upon how much is taken in direct taxation upon the indirect tax content of the final outlays to which they give rise and upon their effect on the savings habits of the recipients. To help the assessment of these differing impacts the expenditure estimates made in the annual surveys are analysed according to the economic or national accounts classification used in the national income statistics.

Public expenditure also varies in the extent to which it is susceptible to control. The central government is able to influence positively most expenditures which come under its direct administration, of which those covered by the Supply Estimates form the greater part. Its control over local authorities' expenditure is much less precise, certainly so far as the year-by-year incidence is concerned. This is an important factor to be taken into account in formulating forward plans of public expenditure and is brought out in the surveys by an analysis of the forward estimates of expenditure according to sub-sector or spending authority (central government, distinguishing Supply Services from the rest, local authorities, nationalised industries and other public corporations). Here again the allocation of

†For convenience the capital expenditure of the broadcasting authorities (other than that on the BBC's overseas services) and the Covent Garden Market Authority has been considered in the same way as that of the nationalised industries.

individual spending agencies to these sub-sectors follows the principles used in the national income accounts.

The annual surveys of public expenditure

The planning and control of public expenditure is a continuous operation, not limited to a decision-taking exercise at any particular time each year, still less to a series of such exercises undertaken in the context of major economic events such as the devaluation of sterling in 1967. But the annual public expenditure survey may be regarded as the central part of this process. In the 1969 survey, departments are being asked to complete over 40 forms; these forms together with explanatory notes of guidance on their completion constitute a formidable document. Some account of the statistical procedures followed in the collection, analysis and presentation of this material and of the uses to which it is put are given below.

The content of the surveys

Each department of the central government is required to return estimates of the expenditures for which it is responsible, whether directly or through other agencies, whether carried on Votes or not, and covering a five-year period starting with the current Estimates year, e.g. in the 1969 survey they will submit estimates for each of the years 1969–70 to 1973–74. In addition they will provide figures of outturn in 1967–68 and an estimate of provisional outturn for the year just ending (1968–69).

The main forms used in the survey provide for the recording of the forward projections and of the estimates of past outturn by functional heading, national accounts category and spending authority. Analyses in these terms are, as has been already noted, central to the decision-making process. This basic information is supplemented by a large amount of additional data, not all of which is provided for every year covered by the main part of the survey.

Since the planning of public expenditure is mainly concerned with expected demand for resources in the context of overall economic management and since the manpower employed in public sector programmes represents an important and scarce resource the forward estimates of expenditure, insofar as they imply a demand for manpower, should be capable of translation into manpower requirements. The survey is used as a means of ensuring consistency in this regard. The design of the survey caters for the needs both of the Civil Service Department for the management of the Civil Service and of the Department of Economic Affairs in the context of the medium-term economic assessments. In order to meet these needs the information on wages and salaries and on manpower is analysed, where appropriate, according to the categories in which the Civil Service is controlled and in terms of the Standard Industrial Classification; the wages and salaries estimates must also be capable of reconciliation with the estimates returned in the main part of the survey for the broader economic categories of expenditure (mainly current expenditure on goods and services) of which they form a part. The surveys are not, of course, the only source of manpower statistics. The departments directly responsible, and particularly the Civil Service Department, require more detailed information, but their arrangements for obtaining it are outside the scope of this article.

In addition information is collected as part of the surveys on the asset composition of gross domestic fixed capital formation (for short and medium-term economic forecasting purposes), on the regional incidence of expenditure on new building and construction (required by those in the Department of Economic Affairs concerned with regional policy), on overseas transactions (for balance of payments purposes) and on research and development (for integration with similar information collected from the private sector into a consolidated assessment of the research and development effort of the nation). This additional information is in general not required for the main purpose which the surveys are designed to serve and much of it had previously been collected under separate arrangements. But experience had shown that considerable time and effort had had to be devoted to the task of reconciling this supplementary information with the estimates of the major components of public expenditure, due to differences of coverage, definition, timing and so on. The collection of all these data as part of an integrated enquiry ensures that comparable definitions are used throughout, places on departments the onus of ensuring consistency within their own material and avoids the considerable effort that previously had to be directed centrally to reconciling divergent series.

The forward estimates of public expenditure are made at constant prices so as to reflect in principle changes in the volume of resources directly or indirectly concerned. Constant price estimates compiled in this way are referred to as 'at Survey prices' of the year in question. Estimates at 1969 Survey prices, for example, will be on a basis which for most of central government and directly related expenditure (e.g. local authority current expenditure supported by central government grant) corresponds to that used for the 1969–70 Estimates of Supply Services and for the remainder corresponds to the price levels of early 1969. In order that the latest estimates for the future, the outturn for the past and the estimates made in the previous survey might all be compared on a common price basis, departments are asked to revalue the previous year's survey estimates and the outturn for the year just ending at the price basis of the current survey.

Finally departments provide additional information on certain receipts paid directly into the Consolidated Fund (required for the compilation of the national income accounts tables in the Financial Statement) and on the relationship between the public expenditure component of the Supply Estimates and the Estimates as measured for Parliamentary purposes and between local authorities' current expenditure as measured in the survey and as calculated for the purpose of determining Rate Support Grant.

The survey timetable and procedures

Departments are required to return the completed questionnaires to the General Expenditure (GE) Division of the Treasury by the end of February each year.‡ Their forward estimates must reflect their latest view of the cost of existing policies on the services for which they are responsible; for this purpose existing policies would normally be defined as the estimates which emerged from the previous year's survey modified to take account of changes agreed subsequently by Ministers either collectively or bilaterally with the Treasury. For the year immediately ahead the figures for Supply expenditure, adjusted to a public expenditure basis, must agree with the relevant components of the Estimates of Supply expenditure as presented to Parliament.

After initial scrutiny and preliminary editing one set of returns is forwarded to the Central Computer Bureau of H.M. Stationery Office for punching and computer-processing and another set to the appropriate policy division of the Treasury for detailed examination and discussion with the departments concerned. The forms on which data are recorded by departments are used as punching documents and as much indicative information as possible is pre-coded. The processing of the returns is carried out by a ICL 1900 series computer and the programs provide for extensive editing and cross-reference checking. Tabulations giving basic analyses of the material and the price index numbers implied by the revaluation returns become available in the second half of March. Summary analyses are sent to Treasury divisions as background to their discussion with departments and also to the Department of Economic Affairs for use in the medium-term economic assessment exercise referred to below.

On the completion of the discussions between the Treasury divisions and departments, agreed amendments to the figures as originally submitted are recorded and notified to GE Division by mid-April in the form of amended returns. These amended returns are again processed by computer and revised tabulations are prepared together with summary tables in a form suitable for photographic reproduction in the draft report on the survey. Returns containing the supplementary information (e.g. the regional material) are also processed at this stage and in all some 40 analyses are produced. The survey report, which includes detailed tables on individual functional heads, prepared by hand from information on one or more tabulations and supported by explanatory text, as well as the summary tables produced by computer, is then considered at official level before submission to Ministers early in June. During the final stages of the preparation of the report amendments to the figures continue to flow in and successive computer runs are necessary to take account of them.

Parallel with this exercise the Department of Economic Affairs prepares a separate report on the medium-term prospects for the economy over a five-year period corresponding to that covered by the public expenditure survey. The timetable of these two exercises is arranged so that the final estimates incorporated in the expenditure survey report are also used in the medium-term economic assessment. The two reports reach Ministers simultaneously in order that decisions on the aggregate and composition of public expenditure in terms of programmes may be taken against the background of the overall economic prospect, in accordance with the philosophy of the Plowden Report.

Updating the survey estimates

The survey estimates are adjusted to take account of decisions agreed by Ministers and the process of reviewing public expenditure continues throughout the year. Arrangements exist for Ministers to be given regular reports on changes in the public expenditure estimates, in total and in terms of their components, resulting from subsequent decisions. Plans are being made to improve this reporting system by the use of the computer. This operation forms an essential part of the process of enabling Ministers to ensure that the public expenditure targets to which they are committed are adhered to.

The estimates of expenditure for year two of the survey period (i.e. 1970–71 in the 1969 survey), as modified by subsequent Ministerial decisions and adjusted for pay and price changes, are reflected in the Estimates of Supply expenditure for that year. The availability of the survey material provides important background to the scrutiny by the Treasury of the annual Estimates submitted by departments and ensures that these Estimates as presented to Parliament accord with the government's declared policies on public expenditure. Similarly the biennial negotiations with local authorities to deter-

‡Only the returns giving information directly related to the expenditure planning operation or to the preparation of tables for the *Financial Statement* are required at this stage. The remaining returns need not be submitted until mid-April.

mine the level of Rate Support Grant take place against the background of the corresponding estimates of local authorities' current expenditure derived from the previous survey. At the time of writing three White Papers giving details of expenditure programmes for the public sector as a whole have been published [4] [5] [2].

Public expenditure and the Estimates

The form in which the Estimates are published tends to obscure their relationship to total public expenditure, particularly on account of the large number of intra-public sector and intra-central government transactions in the former. The relationship between the conventional accounts of the central government and the national income accounts is described in Chapter IX of *National Accounts Statistics: Sources and Methods.* In recent years several changes in presentation have been introduced to display this relationship more clearly. Since 1962–63 the *Memorandum on the Estimates by the Financial Secretary to the Treasury* has included a table showing an analysis of Supply expenditure by functional headings similar to those used for making forward expenditure plans and another table giving an analysis of the same total by national accounts categories. A table showing a functional analysis of the Estimates by summary headings is also published in the *Vote on Account* (the means whereby the government obtains Parliamentary authorisation to incur civil expenditure during the coming year in advance of the passing of the Appropriation Act, which gives effect to the main Estimates). Also starting from 1962–63 an analysis of estimated expenditure by national accounts category has been included in the form of supplementary information to each Vote in the detailed Estimates of both civil and defence expenditure. The *Financial Statement* published on the occasion of the 1965 Budget included a table giving a national accounts classification of central government transactions and in the following year this analysis was extended to cover the whole of the public sector. In the most recent *Financial Statement* this process was carried further by the inclusion of two additional tables showing respectively how Supply expenditure and other transactions of the Consolidated and National Loans Fund combine with transactions on other funds and accounts to form a consolidated central government account and how the latter relates to the public sector account as a whole.

Short-term economic forecasts

The 1968–69 *Financial Statement* gave details of the economic forecast on which the Budget judgment was based. The public sector components of the economic forecasts, which are made regularly within the Treasury three times a year, are derived from the relevant survey estimates updated for subsequent changes in the way described and adjusted to the constant price basis used in the national accounts. The updated survey estimates, adjusted to current prices, also form the basis of the thrice-yearly forecasts of expenditure, income and saving at current prices which are made concurrently with the constant price forecasts in order to assess the financial and monetary implications of the constant price forecasts. A description of the methods used to compile the constant price forecasts appeared in the August 1964 issue of *Economic Trends* and an account of the techniques used to prepare the current price forecasts was given in the February 1968 issue of *Economic Trends.*

Conclusion

The process of public expenditure planning and control is inseparable from that of managing the economy as a whole. For this to be effective the projections of expenditure must be measured in a way which reflects the demands on real resources implicit in expenditure decisions and which enables performance to be checked against programmes in comparable units of measurement. In terms of statistical requirements this implies the existence of a satisfactory constant price basis for the forward estimates so that they measure real resource absorption both over time and as between individual programmes, and of a comprehensive and speedy system for reporting outturn geared to the form in which the forward estimates are compiled. The achievement of a satisfactory constant price basis raises a number of difficult theoretical and practical issues, while the outturn requirement involves organisational problems, affecting a number of departments, which are particularly acute in the local authority field. It would be misleading to give the impression that these difficulties have yet been resolved. But, together with other statistical and presentational problems in this complex field, they are being tackled as part of the continuous process of improving the statistical base for decisions on the level and composition of public expenditure.

APPENDIX

Definition of central government

In the conventional accounts of the central government all transactions pass through either the Consolidated Fund or the National Loans Fund. Proceeds of taxation and other revenue receipts are paid into the former. Issues from the Consolidated Fund comprise Supply Services, which have to be voted annually by Parliament, and Standing Services, which are charges placed directly on the Fund under specific Acts without the need for annual authorisation by Parliament. The National Loans Fund is a separate fund set up by the

National Loans Act, 1968, through which pass all transactions on government borrowing and the bulk of the government's domestic lending.

In the national income accounts the central government is defined so as to include also the transactions of certain other funds and accounts administered by departments, such as the National Insurance Funds and the Redundancy Fund. In measuring central government receipts and expenditure in the national income accounts all transactions between the various funds are netted out.

References

(1) *Control of Public Expenditure* (Plowden Report), Cmnd. 1432.

(2) *Public Expenditure in 1968-69 and 1969-70*, Cmnd. 3515, January 1968.

(3) *National accounts statistics: Sources and Methods*, Studies in Official Statistics, No. 13 (HMSO) 1968.

(4) *Public Expenditure in 1963-64 and 1967-68*, Cmnd. 2235, December 1963.

(5) *Public Expenditure: Planning and Control*, Cmnd. 2915, February 1966.

Supplementary benefits

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This is the first of a series of notes promised in *Statistical News* No. 2 bringing up to date information about social security statistics.

The Ministry of Social Security Act 1966 brought to an end the schemes of national assistance and non-contributory old age pensions. In their place it substituted a new scheme of supplementary benefits payable to those people aged 16 or over and not in full-time work whose resources were insufficient to meet their requirements as defined in the Act. Persons of pensionable age and over (65 for a man and 60 for a woman) became entitled to a 'supplementary pension' and those below pensionable age to a 'supplementary allowance'. The Ministry of Pensions and National Insurance and National Assistance Board were combined to form a new Ministry of Social Security which following the recent merger with the Ministry of Health now forms part of the Department of Health and Social Security.

In 1965 the M.P.N.I. and the N.A.B. had carried out a large-scale survey [1] which showed that substantial numbers of retirement pensioners could have been receiving national assistance but for various reasons had not applied for it. It was hoped that the introduction of a new scheme with rules which were more equitable and easier to understand, administered by the same Ministry as is responsible for national insurance benefits, family allowances and war pensions, and heralded by a massive publicity campaign, would get rid of any stigma attaching to the receipt of national assistance and encourage old people to claim what was due to them. In the event, close on half a million successful new claims to supplementary pension were made during the first nine months of the new scheme.

The basic principles of the supplementary benefits scheme are much the same as for national assistance. Broadly speaking, the resources of the claimant and his dependants if any, are measured against their requirements according to scales laid down in the Act and Regulations, plus an addition for rent. Most national insurance benefits are counted in full but other forms of income may be disregarded up to certain limits. For example, part-time earnings are disregarded to the extent of £2 for a claimant (£1 if he is required to register for work) and £2 for his wife; a maximum of £2 from other sources such as disability pension, occupational ension, voluntary payments etc. is also disregarded. Savings and capital (other than owner-occupied property) in excess of £300 are taken as representing a notional weekly income. The rent addition is generally the actual net rent paid, paid by the claimant except that earning members of the household are deemed to contribute their proportionate share. A claimant who lives as a member of someone else's household, receives a statutory rent addition of 11s. 0d.

The main changes brought about under the new scheme were the introduction of a 'long-term addition' for all supplementary pensioners and for people under pension age (except those registered for work) who have received benefit for a continuous period of two years or longer, which reduced the need for the large number of minor discretionary additions characteristic of the national assistance scheme; a more rational system of 'disregards' and treatment of capital assets; and a firmer concept of entitlement.

The rules are more fully explained in the *Ministry of Social Security Annual Report* for 1967. From 7th October 1968 the main rates are as follows:

	Supplementary pensions			*Supplementary allowances*		
	£	s.	d.	£	s.	d.
Married couples	7	19	0	7	9	0
Single householders	5	1	0	4	11	0
Non-householders over 21 ...	4	4	0	3	14	0

The supplementary pension rates include the long-term addition (10s. 0d.). Further additions are made for dependent children according to age (e.g. £1 7s. 0d. a week for a child under five years of age).

Where the person claiming benefit, or his wife, is a householder a sum is added to requirements in respect of 'net rent'. This comprises the rent payable for a week plus the weekly amount of general and water rates and, for owner occupiers, mortgage interest and allowance for repairs and insurance less the proceeds of any sub-letting in both cases. The amount would normally be reduced by the proportionate share attributable to any member of the household who is not dependent on

(1) Financial and other circumstances of retirement pensioners, (HMSO) 1966 (Price £1 0s. 0d.).

the claimant. Exceptionally, it may be reduced because the rent is considered unreasonably high in the claimant's circumstances.

In November 1967 the average weekly 'net rent' of those householders receiving supplementary benefit was as follows:

	Supplementary pensioners	*Supplementary allowance recipients*
	s. d.	s. d.
Local authority tenants ...	40 8	46 4
Tenants of private landlords ...	30 1	44 2
Owner occupiers ...	18 11	29 4

In November 1968, 2,637,000 people in Great Britain were being paid supplementary benefit. The benefits covered a further 1·3 million wives and dependent children making almost 4 million people altogether. The total number of claimants can be broken down into the following groups:

Table 1. Claimants for supplementary benefits

	Thousands
Supplementary pensions	
Retirement pensioners i.e. with national insurance pension	1,620
Widow pensioners (over 60) i.e. with national insurance pension	56
Others over pensionable age	171
Total supplementary pension	1,847
Supplementary allowances	
Unemployed	225
Sick and disabled with national insurance benefits ...	169
Sick and disabled without national insurance benefits	154
Widows (under 60) with national insurance benefit	65
Women with dependent children	159
Others	18
Total supplementary allowances	790
Total supplementary benefits	2,637

In November 1968 the average weekly allowance paid was about 63s. 0d. (46s. 6d. for supplementary pensions and 101s. 6d. for supplementary allowances).

A similar classification was used when the national assistance scheme was in being and it is, therefore, possible to make some comparisons of numbers of recipients over a period of time. Table 2 does this for various dates just before and since the change to supplementary benefits.

The number of people receiving supplementary benefit changes over time. Increases in the scale rates and level of rents tend to raise the number; increases in the value of insurance benefits, family allowance and the general level of earnings will tend to lower it. The number of supplementary pensioners increases regularly because of the present increase in the numbers of people of pensionable age; the number of supplementary allowances depends to a great extent on the level of unemployment. Comparisons over time in supplementary benefit statistics are therefore often difficult to interpret unless account is also taken of such factors.

Method of collecting statistics

The supplementary benefits scheme is administered locally. Claims are received, decisions given on them and payments authorized at over 400 local offices. Casepapers and records are retained in these local offices and there is no central reference point from which statistics can be extracted. The difficulties of collecting statistical information from this decentralised organization will be obvious; the quality of the statistics depends on the standard of accuracy achieved by non-specialized local office staff. These staff have to assimilate and apply detailed instructions for selecting samples and completing enquiry forms.

Table 2. National assistance and supplementary benefits

Number of regular weekly payments by type of beneficiary

Thousands

	National Assistance		*Supplementary benefits*		
	December 1965	*September 1966*	*December 1966*	*November 1967*	*November 1968*
All Supplementary benefits	2,012	2,052	2,495	2,559	2,637
All supplementary pensions	1,435	1,464	1,819	1,796	1,848
Retirement pensioners	1,196	1,230	1,577	1,557	1,620
N.I. widows over 60 years	43	47	54	56	56
Others over pension age	196	187	187	183	171
All Supplementary allowances	577	588	676	763	790
Unemployed	112	115	179	229	225
Sick and disabled with N.I. benefits	149	150	156	160	169
Sick and disabled without N.I. benefits	138	137	142	149	154
N.I. widows under 60 years	55	53	59	64	65
Women with dependent children	108	118	125	144	159
Miscellaneous	15	15	16	17	18

Supplementary benefit statistics are collected in the following ways:

Physical counts of current cases

On the last Tuesday but one in each month (except for December when the count may be made a week earlier to avoid Christmas) a count is made by every local office of the casepapers in which a weekly allowance is currently in payment. This count shows separately the numbers of weekly supplementary benefit payments being made at postoffices, employment exchanges and (a small number) at local offices. In February, May, August and November these counts are elaborated to provide the analysis by statistical groups shown in Table 1. The results of these counts are reported to Headquarters through Regional Offices, where regional summaries are prepared.

Claims and other transactions

Each local office maintains, for control purposes, records showing (*a*) the number of claims to supplementary benefit received and the decisions given on them, i.e. whether to make a continuing weekly payment, a single payment, or no payment at all; (*b*) lump-sum payments made to meet exceptional requirements which cannot be paid for from the weekly allowance such as replacement of bedding or major items of household equipment, and to meet national health service charges; and (*c*) the numbers of callers at the local office and the numbers of visits to recipients. These records are summarised in each office and the totals are reported to Headquarters, through the Regional Office, at the same intervals as the numbers of current weekly allowances.

Expenditure

The rate of expenditure at a point in time is estimated quarterly (February, May, August and November) by listing the amount of supplementary benefit in payment in a sample of 1 in 80 of the current cases counted on the previous day and classified. This produces a sample of some 32,000 cases and gives a reasonably accurate guide to the Ministry's total weekly expenditure on all current cases.

Detailed analysis of current cases

The 1 in 80 sample of current cases taken in November of each year is analysed in considerable detail to show the characteristics of recipients, e.g. their ages, marital status, family size, household status, rents paid, type of accommodation occupied, resources other than supplementary benefit; capital and any special needs. This annual enquiry provides a wealth of valuable data for use in the formulation of policy. But it is not practicable to obtain from it information which is required from time to time about special aspects of the supplementary benefits scheme, which may relate to groups of recipients not identified in the main sample. As an example, a special enquiry was carried out in June 1967 into women recipients in cases where men were liable to contribute to their, or their children's maintenance. The enquiry was concerned with (among other things) the amounts contributed by deserting husbands and putative fathers to the needs of women living alone. In this instance it was necessary to use a fairly elaborate method of sampling which involved listing every relevant case in the entire country and to use a sampling fraction appropriate to the total number of cases thus discovered.

Publication

The *Annual Report of the Ministry of Social Security* for 1967 gives extracts of all the information described above as at November 1967. Figures from the monthly counts of current cases are published in the *Monthly Digest of Statistics* and in the *Annual Abstract of Statistics*. In the latter, the Department of Health and Social Security figures are amalgamated with those of the Ministry of Health and Social Services (Northern Ireland).

Sampling in local offices

As mentioned above most of the detailed statistics of supplementary benefit are based on quarterly samples of 1 in 80 of the 'live' case papers in a particular week; these are casepapers on which there is a current determination to pay a regular weekly allowance. In some cases however, payment will not be made in the week of the count because, for example, an unemployed person has found work or a retirement pensioner has died. Recipients of supplementary benefit who have been paid after personal application, and for whom no regular running order has been granted, are excluded from the 'live load'; many of these beneficiaries receive only one payment to meet short term need but some receive such payments regularly for a few weeks before a running order is granted.

Casepapers are filed in numerical order in separate 'live' and 'dormant' runs. The 'E' cases, i.e. the unemployed, are filed separately from others. The 1 in 80 sample is selected systematically by working through the live files, starting at the 40th casepaper and selecting every 80th thereafter. Because a number of casepapers are always in action, the sampling is continued by selecting one in 80 of those casepapers which are being dealt with by officials within the office. The number selected is checked against the 100% counts of the live load made on the previous day.

The composition of the sample by statistical categories differs slightly from that given by the 100% counts; the sample results are therefore grossed up to agree with the composition of the 100% counts. There is in fact a slight bias in this method. In the November 1967 annual enquiry for example this method of sampling produced 1 in 79 of supplementary pension cases (two thirds of the live load) and 1 in 83 of supplementary allowance cases (one third of the live load).

There is, of course, no check on the accuracy of the 100% counts but it is not believed that these are seriously in error overall. The classification by statistical symbol on the casepaper cover can be, and is, checked when the 1 in 80 sample is analysed in detail once a year. From the 1967 annual enquiry it was found that a number of errors exist in the statistical classification on casepapers but most of these arise because the classification is not revised as soon as the claimant reaches pensionable age (i.e. 65 for men, 60 for women). For example, examination of casepapers marked W – i.e. widows under 60 – revealed that some 10% should really have been marked WO – i.e. widows over 60. However, such errors although causing anomalies in the statistics are not serious enough to mislead the users.

The analysis of sub-samples of casepapers in local offices depends to a great extent on the accuracy of the local staff in extracting data. A sub-sample of the casepapers selected for the November 1967 enquiry were therefore analysed independently and the results compared with those obtained by local staff. The results were encouraging and showed that the error rate in local offices on most items extracted was small. The one exception, length of time the claimant has been on supplementary benefit ignoring gaps of less than 3 months, is difficult to extract and it is not surprising that errors were higher for this than for other items. This check has led to modifications in instructions to local offices which may improve the accuracy of data on this item in future.

Sampling methods in local offices are under review. The present 1 in 80 sample of all case papers yields more pension cases than are needed and fewer allowance cases than are desirable for the quarterly analyses, and the possibility of using a smaller sampling fraction for pension cases and a larger one for allowance cases is being considered.

Population Census pre-test 1968

A. A. Cushion, *Chief Executive Officer, General Register Office*

Introduction

The first of two large-scale census tests in preparation for 1971 was held in April in ten areas in England and Wales and ten in Scotland. The test covered most types of area but over-represented densely populated urban centres where census enumeration was known to be difficult. It was concerned essentially with procedures and with the measurement of workloads, and no census-type statistics derived from the test will be published or circulated.

The first part of this article covers the findings in England and Wales; the test in Scotland was much smaller (30 enumeration districts against 248), circumstances were somewhat different and the main Scottish findings are summarised at the end.

The test was voluntary, and of the 37,641 private households occupied on census night 27,869 (74·0%) forms were completed or partially completed by householders; 6,844 (18·2%) were refused outright and 2,928 (7·8%) could not be collected. The last category includes people who evaded contact with the enumerator, thereby effectively, if not overtly, refusing.

The income question

Three types of form were tested; one containing a three-part question on income; a second with the income question replaced by one on occupation a year ago and a third containing only a few basic questions with a longer form delivered subsequently to a 10% sample of households. The response rates for the income and non-income forms were:

Number

	Income	*Non-income*
Occupied household	14,760 *100%*	15,172 *100%*
Completely or partially completed ...	10,070 *68·2%*	11,085 *73·1%*
Open refusal	3,302 *22·4%*	2,870 *18·9%*
Effective refusal	1,388 *9·4%*	1,217 *8·0%*

Evaluation of response to the income question is complicated because of the low overall response rates, but of the 21,322 persons who should have answered the question in the 14,760 households completing the form, 3,150 (14·8%) refused and a further 2,015 (9·5%) left the answer blank. The latter category includes some persons with no income but these cannot be distinguished from refusals.

Social Survey in a follow-up of some 2,000 households found that 20% of householders who refused the form containing the income question mentioned income as one of the reasons for their refusal.

In summary, the response to the income question was poor; fewer households accepted the census form and some 15% to 20% of the persons in households accepting the form failed to answer this particular question.

Country of origin

The opportunity was taken to try out a question on country of origin to identify children born in this country to immigrant parents but no longer living with their parents and therefore not identified by association with them. Country of origin was defined as normally being the parents' country of birth; but with provision for disregarding birthplace when not considered to be the country of origin (for example, a father born in India of British parents). The concept is a difficult one to put simply on a census form, and difficult to evaluate. Some immigrant householders did not answer the question (for example of 896 children with both parents born in India no answers were given in 11% of cases). This may have been because they found it difficult to answer what was to them a confusing question.

Sampling methods

Field sampling is a controversial census method. In the 1961 Census it was hoped by confining 'occupation and industry' to a 10% sample to produce the main results of the Census more quickly than would otherwise to be possible. Bias was discovered in the 1961 sample, but information on the nature of the bias was very restricted. Enumerators had erroneous notions of sampling and the latitutde allowed in the issue of sample forms permitted enumerators to influence the selection, resulting in an unrepresentative sample.

The need to provide census results quickly has been emphasized for 1971. This leaves choice between office sampling of a 100% return on all census questions, and field sampling. The 1968 field sampling method drew on 1961 experience and the Pre-test objectives were to determine whether enumerators could influence and bias selection of the sample, and to examine the adequacy of measuring techniques.

In the 1968 system short 'Q' forms, printed and arranged with the digits '0' to '9' in repeating sequences, are delivered in the strict order of the sequences to all the households in an enumeration district. On collection, one of the ten digits indicates that a household is to be asked to complete a longer sample form for later collection. The enumerators are told the key digit after Census Day and selection of the 10% sample is automatic.

In the 50 enumeration districts in the test of sampling, 6,697 'Q' forms were completed and returned, of which 715 were from sample households. Of the total households counted, including those which did not return information, 9·7% formed the sample. Public reception of the short 'Q' forms was understandably better than reception of the long forms used in the other enumeration districts, and only 8·8% were recorded as refusing 'Q' forms. When requested to fill in the longer sample form, the second chance for refusal was taken by 14% of sample households who completed a 'Q' form, but did not complete a sample form. Refusal, however, is only of significance in a voluntary test and cannot easily be related to factors in a full census. Data used in the evaluation of the sampling method were the characteristics of households and persons returned on the 'Q' forms, plus records kept by enumerators. Certain field procedures proved not to have a rigorous enough specification and produced ambiguous records. For example, enumerators varied in dealing with non-productive calls, frequent in densely populated urban environments. Future sampling tests can be improved on the basis of these findings. Tests for bias in the 10% sample of households or persons showed some departure from hoped-for accuracy at the relatively detailed level of groups of five enumeration districts. There was, however, no indication of a repetition of the uni-directional enumerator-induced bias which was present in the 1961 results, although this conclusion must be qualified by the relatively small size of the test.

Enumeration

Procedures

The test was designed primarily to test enumeration procedures. Written instructions to enumerators were supplemented by 4 hours training by the local controlling officer who had previously attended a week-end briefing session. A verbatim training manual with visual aids was supplied to the controlling officers; a new venture which seems to have been worth the effort involved in its preparation. Observers from the Census Office watched enumerators in the field and a number of valuable lessons were leant; in particular, the immense difficulty of applying the census definition of a structurally separate dwelling in some areas and the danger of enumerators, when assisting householders, paraphrasing the census questions to produce a version sometimes far removed from what was intended.

Post-enumeration survey

Several field checks were carried out after the enumeration. The Government Social Survey interviewed some 2,000 householders, concentrating largely on enumeration procedures, but with a specific check on a new version of the 'Rooms' question and a first attempt to find out how the householder eeacted and sets about filling in the form. Census Office staff visited each area and carried out various coverage checks, notably a check against the Electoral Register. The heavy weighting of difficult areas prohibit drawing quantitative conclusions, but the checks revealed some common examples of omissions by enumerators, such as flats in otherwise non-residential property and corner houses with addresses in both streets.

Postal enumeration

An experiment in reducing the enumeration work was made in half the non-sample enumeration districts by inviting householders to return the completed form by post. The voluntary nature of the test was against the experiment, but even so results were disappointing. Only 56% of the 13,513 forms were posted and almost a half of these were incorrectly completed so that the enumerator had to call back. Some controlling officers operated an experimental bonus-payment scheme designed to give them a say in the reward for work done, and almost without exception, bonuses were recommended for the 'postal' enumerators because of the extra work incurred. As a footnote to the experiment, 217 forms were claimed to have been posted but were not received. Leaving aside the legal complications in a compulsory census, the postal method would provide us with something of a retrieval problem in 1971.

National Grid referencing

Enumerators were instructed to provide National Grid co-ordinate references for each building they recorded; to 100 metre co-ordinates where 25 inch or 50 inch to the mile Ordnance Survey maps were available or to kilometre co-ordinates where only 6 inches to the mile maps were available. References in the 100 metre areas were checked centrally. 27,920 buildings were listed and 27,701 (99%) of them given a reference. 95·4% of the references were correct, and some of the errors were so widely wrong (mainly clerical mistakes) that they could have been detected by a simple computer check and corrected in a full census. The results of the test and an earlier feasibility study show that a success rate of about 96% can be expected in a full census, and that about half of the errors will be assignments to an adjacent National Grid square. It may be of interest that women enumerators were marginally better map readers than men; (this discovery arose from a suggestion that the converse might be the case).

Summary of Scottish findings

The Scottish pre-test took place in ten randomly selected areas. Each area had three enumeration districts of which two had the income question with normal return or postal return, and the third had an alternative question. Field sampling was not tested. Summary results were:

	Income and postal return	*Income*	*Alternative*
% of forms returned for households with occupier present on census night...	86·6	89·4	93·4
% of persons (over 15 entered on returned forms), who refused the income or alternative question ...	31·5	34·9	11·2

Refusal to answer the income question was especially noted among the self-employed.

Grid referencing to 100 metres was done throughout, including areas mapped at 6 inches to the mile scale. Checks carried out by the Census Office reveal that 95·9 per cent of the references allotted by enumerators were correct.

Conclusions

The 1968 pre-test proved to be a most useful exercise, although many of its findings are not conclusive. It is clear that inclusion of an income question, in the form that was tested, had an unfavourable impact on the attitudes of some members of the public to the questionnaire; a different form of question (e.g. a request for figures to the nearest hundred pounds) might produce a better response. Re-wording of the country of origin question would probably produce satisfactory results. The method of field sampling tested may prove to be satisfactory, but the test was not large enough to be certain of no bias. The importance of training enumerators has been established, and better results can be expected if controlling officers are required to impart only one type of instruction; simpler concepts and definitions will also improve accuracy of response. Postal enumeration, although used abroad, does not appear likely to be successful in this country yet. The earlier finding that National Grid referencing to 100 metre square would be possible, has been confirmed, even if maps of scale 25 inch or 50 inch to the mile are not available.

The 1969 pre-test, which is intended to serve as a dress rehearsal for 1971, will throw further light on some of these conclusions, but there is clearly a need for a long-term research and development programme for census procedures; a small testing programme shortly before a full census can only eliminate major faults, and leves no time to test adequately any modifications that may be necessary.

Notes on current developments

POPULATION AND VITAL STATISTICS

1966 Sample Census of Population

England and Wales

The *Migration Regional Reports* for the South Eastern and East Midland Regions have now been published completing the series mentioned in *Statistical News* No. 3.

East Midland (November 1968) GRO, Price £1 10s. 0d.
South Eastern (December 1968) GRO, Price £5 0s. 0d.

The *Economic Activity County Leaflets* contain four tables:

1. Economically active persons by area of residence: Occupation and status by sex
2. Persons in employment by area of workplace: Occupation by sex
3. Persons in employment by area of workplace: Industry and status by sex
4. Economically active males by area of residence and socio-economic group

Tables 1–3 relate to counties, county boroughs, urban areas with population of 50,000 and over, new towns and conurbation centres. The information is available in unpublished form for all local authority areas and can be obtained from the General Register Office for the cost of reproduction. Table 4 shows all areas.

Also published is an *Economic Activity County Leaflet, General Explanatory Notes*. The leaflets for England and Wales were published in December 1968 and January 1969, the price ranging from 3s. 0d. to 6s. 0d.

The *Household Composition Tables* provide information on the composition and social and economic characteristics of households and families. The tables are published separately for England and Wales and Scotland. Those for England and Wales include some appendix tables for Great Britain as a whole.

The *Housing Tables* for England and Wales are published in two volumes and contain tabulations not covered by the *Great Britain Summary Tables* on dwellings, households, tenure, household amenities, cars and garaging. Some tables for local authorities' areas are also included. Statistics are also included for non-private establishments such as hotels, hospitals, etc.

References

Sample Census 1966, England and Wales, Household Composition Tables, (HMSO), December 1968 (Price £3 17s. 6d.).

Sample Census 1966, England and Wales, Housing Tables, Part I and Part II, (HMSO), January/February 1969 (price not known at present).

Scotland

The *Housing* and *Household Composition* volumes and the regional leaflets on *Economic Activity* have now been published. The publication dates and prices for Scottish volumes subsequent to the *County Reports* are:

Special Study Areas (100% enumeration tables as in county reports) March 1968 (£4 4s. 0d.)

Workplace and Transport (persons living or working in an area; transport to work) May 1968 (£2 2s. 0d.)

Migration I (migration of persons within Scotland and between Scotland and rest of G.B.) August 1968 (£2 19s. 0d.)

Housing (characteristics of households and their accommodation) October 1968 (£1 16s. 0d.)

Household Composition (family and economic relationships of households December 1968 (£1 16s. 0d.)

Economic Activity Leaflets (occupation, industry and socio-economic group) December 1968 (Prices vary)

Migration II (migration of households and families) by March 1969

Usual Residence and Birthplace by March 1969

Each report gives details of unpublished extensions of the tables for smaller areas, which are generally available for the cost of reproduction.

Population

The estimate of the population of each local authority area as at 30 June 1968, contained in this year's population pamphlet, continues the series of separate pamphlets begun with the estimates for 1948. Estimates for the revised standard regions now used for planning purposes as well as figures for conurbations and for urban and rural aggregates are also included. All these figures will subsequently appear in the *Registrar General's Statistical Review* for the year 1968 but are published separately at this stage to meet the widespread demand for early knowledge of the latest figures.

These mid-1968 estimates are based on the final results of the Census of 1961 adjusted in the light of available data on the subsequent births and deaths and the movement of population, including the 1966 Sample Census corrected for area of usual residence.

The Registrar General's Statistical Review of England and Wales, Part II contains detailed information on population; marriages, live births and stillbirths; vital statistics for local areas; marriage analyses; divorces; natural increase and migration; registration of births and adoptions; parliamentary and local government electors; commonwealth and foreign populations; fertility analyses.

References

The Registrar General's Annual Estimates of the Population of England and Wales and of Local Authority Areas 1968, (HMSO), January 1969 (Price 2s. 9d.).

The Registrar General's Statistical Review of England and Wales for the year 1967, Part II Tables, Population, (HMSO), January 1969 (Price £1 10s. 0d.).

Migration

Table S in the *Registrar General's Statistical Review of England and Wales for 1967, Part II* has been redesigned and separated into three main groups of sub-tables. The first, Table S.1, gives the balance of civilian passenger movement into and out from the United Kingdom. The second group, under the general heading of Table S.2, shows migration between the United Kingdom and countries beyond the British Isles based on figures derived from the International Passenger Survey. The final series, Table S.3, indicate the net migration element in population change.

Quarterly Return No. 479 includes a detailed analysis of migration from and into England and Wales for mid-1967 to mid-1968 based on the International Passenger Survey.

The Return also shows the additional factors which have to be taken into account when estimating the complete net migration content of population change for England and Wales. These factors include:

net movement from other parts of the United Kingdom and adjacent islands;

net movement from the direct traffic between this country and the Republic of Ireland;

amendments to the International Passenger Survey net totals by an estimate of the difference between actual and intended migration in the period;

deployment of H.M. Forces and Allied Forces between this country and elsewhere.

References

Registrar General's Quarterly Return for England and Wales, No. 479, Quarter ended 30th September 1968, (HMSO), January 1969 (Price 3s. 6d.).

Statistical Review Part II, 1967 – see under 'Population'.

Vital statistics (Scotland)

The *1967 Annual Report of the Registrar General for Scotland* was published on 6 December 1968, price £2 10s. The *1968 Report* will be published in two parts to allow expanded tabulation on some subjects to meet users' needs, and to increase comparability with tabulations for England and Wales. The third Quarterly Report for 1968, to be published in February 1969, will again include partial classification of deaths to both the 7th and 8th Revisions of the International List of Causes of Death. Estimates of the population of administrative areas by age and sex will be included in the fourth Quarterly Report, and in the 1968 Annual Report.

Life Tables (England and Wales)

The English Life Tables No. 12, prepared by the Government Actuary at the invitation of the Registrar General for England and Wales, on the basis of the deaths in England and Wales in the years 1960, 1961 and 1962 and of the population enumerated at the 1961 Census, are contained in the *Registrar General's Decennial Supplement, 1961, Life Tables*. They extend a series that has continued for well over a century. The Supplement also gives mortality rates according to marital condition and compares mortality in different geographical areas, standard regions and conurbations. Abridged Life Tables for England, Wales and Greater London are also given.

A new feature in this series is an improved method of estimating the population'exposed to risk'.

Reference

The Registrar General's Decennial Supplement, England and Wales, 1961, Life Tables, (HMSO), December 1968 (Price 8s. 0d. net).

Marriages

The quinquennial presentation of tables analysing marriages by manner of solemnisation appears in the *Statistical Review, Part II* (at Appendix C). This volume also includes tables showing the numbers of buildings that were certified for worship and those in which marriages could lawfully be solemnised as at 30 June 1967.

Reference

Statistical Review Part II, 1967 – see under 'Population'.

Fertility

Quarterly Return No. 479 contains a new table giving seasonally adjusted quarterly fertility rates.

Reference

Quarterly Return No. 479 – see under 'Migration'.

SOCIAL CONDITIONS

Occupational pension schemes

Occupational Pension Schemes – A Third Survey by the Government Actuary was published on 31 December 1968 (HMSO, Price 5s. 6d.). The two previous reports had similar titles and were issued respectively in 1958 and in 1966. These surveys, which relate to the United Kingdom as a whole, provide details of the numbers of such schemes and the numbers of their members, and give information, not fully available elsewhere, on the contents of their rules and the way in which they are operated. They are based on enquiries addressed to stratified samples of employers.

Since the first report, which related to the year 1956, the number of schemes has increased from 37,500 to 65,000 and the number of their members from 8 to 12 million. Big developments have occurred in the size of contributions and benefits and in the mode of their adaptation to national pension provision. The reports survey the methods by which pensions may be preserved on a change of employment, and the extent to which these methods are used in practice. They also touch upon the arrangements which are made to keep pensions in line with living costs. Separate information is given for the public and private sectors of the economy.

The organisations on whose behalf such schemes operate now employ some 22 million people in all, a high proportion of the total labour force of the United Kingdom. Nearly one-half of these employees do not, however, at present qualify for admission to the schemes for a number of reasons: over 3 million are too young or their length of service is too short; about $4\frac{1}{2}$ million are ineligible because of the nature of their work; and more than 2 million are excluded for a miscellany of other reasons.

The amount of money paid into schemes by way of contributions from employers and members now amounts to about £1,300 million a year, of which the major part is borne by employers. Expenditure on benefits is over £900 million a year, of which about £600 million relates to pensions in payment.

There is a great diversity of schemes, and conditions as to contributions, pensions and other benefits vary a good deal from one to another. For example, nearly one-third of members do not pay any contributions, but among those who do the amount, expressed as a percentage of pay, ranges from under 1 per cent up to about 6 per cent. Employers pay anything up to £200 a member. Pensions usually begin at age 65 for men and age 60 for women and may be expressed in a number of different ways. Some pensions are at a fixed rate for each year of service, but more are expressed in relation either to final salary or to average pay throughout service. A few are calculated in other ways. The proportion of schemes of each type is set out in the latest report, showing also the proportions of members affected. There has recently been a marked increase in levels of prospective benefits and a growing proportion of pensions are being linked to final salary at the time of retirement. Lump sum retirement benefits may also be provided, and in the private sector these usually arise from the commutation of part of the pension. Some 5 million active members are covered for widows' pensions, and the remainder are mostly eligible for lump sum death benefits.

Other statistical information about British occupational pension schemes is available periodically as follows:

Self-administered schemes:

Details of growth in funds and how they are invested are regularly published in *Financial Statistics*. Particulars of membership, income and outgo, obtained by enquiry among consulting actuaries, are published from time to time in the *Journal of the Institute of Actuaries* (Staple Inn Hall, Holborn, London W.C.1).

Insured schemes:

A few particulars of membership and finances are set out in booklets on Life Assurance issued annually by the Life Offices' Association and Associated Scottish Life Offices, Aldermary House, Queen Street, London E.C.4.

Redistribution of income

An article describing the incidence of taxes and social service benefits on households of different types and with different incomes in 1967 is published in the February 1969 issue of *Economic Trends*. Previous articles in the series were published in *Economic Trends* in November 1962, February 1964, August 1966, February and July 1968.

The results are based on information obtained from the Family Expenditure Survey which is carried out on a continuous basis by the Government Social Survey for the Department of Employment and Productivity. The sample was doubled at the beginning of 1967 and now covers over 7,000 households.

Statistical work at New Scotland Yard

An operational force such as the Metropolitan Police cannot use its resources to the best effect unless its senior officers are well informed about the current situation in which the force is working. Figures must be available showing available strength and its distribution, and the distribution of crime, accidents and other matters needing police attention.

When Lord Trenchard was appointed Commissioner in 1931 he soon perceived that his Statistical Branch existed only in name since its functions were mostly restricted to the regular production of standard criminal and licensing returns for the Home Office. Operational statistics, in so far as they existed at all, were dealt with in a number of different Branches so that they conformed to no regular pattern. Nobody seemed concerned, said Lord Trenchard, with showing the administration by figures, graphs and plans, what was actually happening in the various spheres of police work.

So, in 1932, Lord Trenchard secured the services of a Statistical Officer from outside the Civil Service and under his direction the statistical work of the force was gradually concentrated in one Branch. This was until recently part of the Secretariat but a major re-organisation of the Metropolitan Police Office last April has placed it in 'G' (General) Department.

Now, with the aid of computers run jointly by Metropolitan Police and Home Office staff, the Statistical Branch turns out monthly surveys and appreciations of crime and road accidents and provides information on strength and sickness of the force and other matters on a regular and *ad hoc* basis. The Branch is also responsible for the Map Room which plots the locations of serious crimes and personal injury accidents and, in addition, makes up special maps from time to time for the use of police investigating particular crimes or groups of crimes, and for the Traffic and Accident Research Branch.

Figures are published annually in the Commissioner's Annual Report, printed and published by H.M. Stationery Office. In addition, analyses of crime and accidents in considerably greater detail are prepared by the Statistical Branch and duplicated internally for issue, on a confidential basis as regards crime, to senior police officers and to persons with a *bona fide* interest in the subjects.

The recent establishment of a Management Services Department at New Scotland Yard will create a demand for more statistical data as well as assisting the Statistical Branch with the refinement of its statistical processing.

HEALTH

National Health Service: Twentieth Anniversary Conference

The Report of this conference gives the broad sweep of problems now facing the Health Service and reveals how closely these are bound up with conceptual and practical questions of quantitative measurement. Seven papers were presented to the conference in sessions concerned with changing medical needs, evolving practice, resource planning, manning the service, and communications. These papers are reproduced in the Report together with a summary of the points made in the discussion which followed each paper.

The conference was much concerned with the relation of resources to needs, the effective use of resources and the problem of distinguishing need from demand. Professor W. J. H. Butterfield of Guy's Hospital, in talking about need, referred to the hidden disease in our community uncovered by almost every epidemiological study where prevalence rates have usually exceeded those recorded in current statistics – the 'clinical iceberg'. Dr. Yellowlees of the Department of Health and Social Security defined 'need' to be the services necessary to deal with pathological conditions which, according to present medical knowledge, require action whereas 'demand' relates to the services considered to be necessary by the population. Demand may be either too modest or too excessive in relation to need.

Data exist in the health field which give some idea of the level of demand but it is notoriously difficult to assess need. Demand itself tends to rise with the expansion of a service: an initial fall in a waiting list is followed by a slow rise as general practitioners get to know of the expanded service. Demands for quite new services are constantly arising, for example, open heart surgery. There is a fairly good knowledge of the nature of the services now provided and of the resources which support them so far as the hospital and local health authority services are concerned. However, data is deficient in relation to the services provided in general practice, mainly because the general practitioners are separate individual contractors to the Health Service. Apart from this gap, there is a lack of data from which needs can be assessed. Moreover, it is extremely difficult to evaluate many of the 'outputs' or 'benefits' which accrue to the individual or to the community as a result of the provision of a particular service. However, the fact that this is a difficult task does not relieve the Health Service of the responsibility of trying to apply the principles involved where this is possible and useful.

The Health Service is thus faced with many challenging problems of quantitative measurement in judging the adequacy, efficiency and quality of the services provided.

Reference

Department of Health and Social Security: *National Health Service: Twentieth Anniversary Conference: Report* (HMSO price 9s. 6d.).

Hospital in-patient enquiry

The *Report on Hospital In-Patient Enquiry for the year 1966, Part I, Tables* was published in January 1969. The scope and purpose of the enquiry was described in *Statistical News* No. 2. Whilst the volume includes tables similar to those published for 1964 and 1965, it also includes two tables relating to surgical operations (excluding those performed in maternity units). This is the first time since 1961 that detailed analyses of surgical operations have been produced in the enquiry. One table shows the number of patients in the enquiry sample upon whom operations were performed analysed by the full Classification of the 1956 General Register Office Code of Surgical Operations. The second table groups the same cases by a condensed list of operation categories and analyses each category by sex and age of the patient; estimates of the total number of operations performed and the average number of beds used daily are also given.

Notifications of abortions carried out under the provisions of the Abortions Act 1967 were published in the *Quarterly Return No. 478* for the first nine weeks of operation of the scheme. This Act required medical practitioners to notify in a prescribed form each abortion carried out.

Quarterly Return No. 479 contains the same analyses by (i) age, marital condition and grounds and (ii) hospital region and place of termination of pregnancy (NHS hospital, approved place, etc.) for the whole of the third quarter of 1968. *Return No. 479* also includes the 1967 annual tabulations of congenital malformations by eleven site groups, for England and Wales, county boroughs and counties. Rates per 10,000 births by sex and type of birth by site of malformation are also given.

References

Report on Hospital In-Patient Enquiry for the year 1966, Part I, Tables, (HMSO), January 1969 (Price £1 11s. 0d.).

Quarterly Return No. 479 – see under 'Migration'.

Morbidity

The most recently published statistics of certified incapacity for work, based on a 5 per cent sample of claimants to sickness benefit under the National Insurance Acts, are those in the *1967 Annual Report of the Ministry of Social Security* (Cmnd. 6393, HMSO, 15s. 0d.). They cover the period 7 June 1965 to 4 June 1966 and analyse spells and days of incapacity by cause. Age-standardised rates for Great Britain, which are expressed per thousand of the insured population at risk, are available on application to the Chief Statistician (Social Security), Department of Health and Social Security, Ivybridge House, 1 Adam Street, London W.C.2.

Similar analyses for the period 6 June 1966 to 3 June 1967 are now available and will probably be published in the *Annual Report for 1968*.

Regional analyses have been prepared comparatively infrequently in the past but are available for the two periods mentioned above as follows: 1965/66 days of incapacity by age of claimant; 1966/67 days of incapacity by cause. Regional rates of days of incapacity per 1,000 population at risk have not been calculated but the regional distribution of the male population at risk for 1966/67 will be available shortly. It is not possible to calculate regional rates for women: married women and widows in gainful employment may choose whether to be insured for sickness benefit or not and their regional distribution by choice is unknown.

At present very little of the detailed morbidity statistics prepared from the analysis of claims to sickness benefit has been published, for the period since 1961/62 other than the summaries which appear in the Annual Reports of the former Ministry of Pensions and National Insurance and its successor the Ministry of Social Security. This should be remedied shortly.

HOUSING

Housing

An article on recent developments in housing statistics in the November 1968 issue of *Economic Trends* reviews work on improving the basic official housing statistics and indicates some of the remaining gaps and weaknesses in the available information.

Recent developments are described in the following fields: current housing progress and short-term forecasting; house sales and house loans; types, standards and densities of new housing; costs and prices; housing finance; normative housing requirements, households and housing stock, housing surveys; *ad hoc* enquiries.

Housing Statistics No. 11 contains some new information in the regular tables on housing loans. The table showing advances by building societies on new and other dwellings has been expanded to include monthly figures, and a new table shows similar details for advances by insurance companies. Another table, also new, shows building society commitments for advances each month since July 1967. The supplementary tables of this issue include estimates of the housing stock in Great Britain (by regions) at the end of June 1968. They also bring up to date information given in previous issues on temporary housing, on the private enterprise housing enquiry, on the number and cost of garages in local authority housing schemes, and on average local authority rents.

The number and size of local authority and new town schemes with dwellings under construction at the end of August 1968 are shown in *Local Housing Statistics No. 8*. This information is similar to, though not exactly comparable with, the results of the private sector housing site enquiry which were published in *Local Housing Statistics No. 6*.

References

Housing Statistics, Great Britain (Quarterly) No. 11, (HMSO), December 1968 (Price 8s. 6d. net).

Local Housing Statistics, England and Wales (Quarterly) No. 8, (HMSO), January 1969 (Price 13s. 0d. net).

Historic Buildings Council for England

The Annual Report for 1967 provides figures of applications received and grants made towards repair and upkeep. It also lists in detail the amounts of grant made for individual properties during the year.

Reference

Historic Buildings Council for England, Fifteenth Annual Report 1967, HMSO 426 (Price 2s. 3d. net).

EDUCATION

Teachers in schools

New figures on the future demand for, and supply of, qualified teachers in maintained primary and secondary schools in England and Wales have been published in *Report on Education No. 51* (December 1968). These are the first figures on this topic to appear since the publication of the Ninth Report of the National Advisory Council on the Training and Supply of Teachers in 1965.

After discussing the success of the teachers' quota arrangements for 1968–69 and the employment prospects for teachers in 1969–70, the Report goes on to give the latest long-term projections of the number of teachers needed and the likely supply up to 1986. Recent trends in entry and wastage of teachers are reviewed and the assumptions underlying two alternative projections of supply are summarised. After comparing these projections with the projections of demand (which are calculated by applying pupil-teacher ratios to estimates of the future school population), the Report concludes that the total supply of teachers will increase faster than the school population and that, after a setback in the early 1970's due to the raising of the school leaving age, the demand and supply might be in rough balance in the latter half of the 1970's.

A more detailed analysis of the figures, and the assumptions behind them, will be included in *Statistics of Education 1967, Volume 4, Teachers*, to be published shortly.

References

Report on Education No. 51 (December 1968), issued by the Department of Education and Science, Curzon Street, London, W.1.

The Demand for and Supply of Teachers 1963-1986, Ninth Report of the National Advisory Council on the Training and Supply of Teachers (HMSO), 1965 (Price 7s. 6d.)

Universities

Statistics of Education 1966, Volume 6, Universities was due to be published in January 1969. This is the first publication in Statistics of Education format of the statistics prepared by the University Grants Committee from returns made by the universities and colleges in Great Britain that are in receipt of Exchequer grant on the Committee's recommendation. By agreement with the Government of Northern Ireland, the corresponding statistics for the Queen's University, Belfast, are also included, and statistics for the New University of Ulster will be incorporated in later issues.

This volume takes the place of the Committee's *Returns from Universities and University Colleges*, which were published in Command Paper form up to and including statistics for 1965–66 (Cmnd. 3586). The change in format has been adopted by the Committee in the interests of improving the layout of university statistics (by using a larger paper size than is possible under Command Paper arrangements) and of bringing greater uniformity into the presentation of educational statistics generally. The present volume covers staff and student figures for the academic year 1966–67 and financial (and student load) figures and statistics of degrees awarded for the academic year 1965–66.

University admissions in 1967

The Universities Central Council on Admissions published their *Statistical Supplement to the Fifth Report, 1966–67* on 26 November 1968. It refers to candidates applying through the Council's scheme for admission in October 1967, and continues the study of candidates' examination achievements measured, in this instance, as at the end of the summer term 1967. A set of tables cross-analyses combinations of grades of 'A'-level pass (or other examination achievement) with the destinations to which candidates are known to have gone, whether university or otherwise; these tables give separate analyses by sex, origin (home or overseas), and first preference subject group of university study. Another set of tables, published for the first time, shows cross-analyses of the combinations of subjects passed at 'A'-level with the candidates' destinations, whether university or otherwise; in the case of those known to have been accepted at a university, there is a further sub-division according to the first preference subject group of university study.

Of the 83,923 candidates for university entry who had taken the GCE examination, 60·4 per cent had passed in three or more 'A'-level subjects, 23·1 per cent in only two 'A'-level subjects and 16·6 per cent had not passed in at least two such subjects. The corresponding percentages for the 45,171 accepted candidates who had taken the GCE examination were respectively 83·7 per cent, 15·0 per cent and 1·3 per cent.

I.D. system for university students and staff

Issue No. 1 of *Statistical News* referred to the individualised data system which is being developed as an improved source of statistics of students and staff in the main sectors of education (page 1.19). In the case of university students and staff, agreement has been reached between the University Grants Committee, the Committee of Vice-Chancellors and the U.K. education departments on the introduction of such a scheme, and the Committee of Vice-Chancellors has now recommended its adoption by the universities. The Universities Central Council on Admissions has agreed in principle to the use of its computer and technical resources for maintaining the I.D. records, and will use its record of applicants as a starting point for the record of undergraduates. It is hoped to extend the 1968 pilot scheme to cover all undergraduate students admitted in October 1969. To this end, a series of one-day conferences was held in November and December at the UCCA headquarters at Cheltenham at which technical problems were examined by representatives of the universities, UCCA and the UGC. The need to ensure the confidentiality of the data relating to individuals is fully accepted by all the participants in the scheme and is being provided for.

MANPOWER AND EARNINGS

Company manpower planning

In October 1968, the Manpower Research Unit of the Department of Employment and Productivity published the first of a new series of Manpower Papers, which will concentrate on methodological issues affecting the Department's work in the field of manpower research. This first booklet deals with approaches to company manpower forecasting and planning.

It begins by discussing the incentives to manpower planning in firms and the conditions under which it is most likely to succeed. Other sections deal with forecasting the supply of labour likely to become available to a company in the future, and methods of predicting future demand for different types of skill. A final section briefly discusses the process of reconciling the supply and demand forecasts thus obtained.

Appendices deal with methods of measuring and predicting labour wastage and promotion movements, and give a bibliography of the relevant literature, together with a list of official statistics and publications of use to the company manpower planner.

Reference

Company Manpower Planning, Manpower Papers, No. 1, (HMSO), October 1968 (Price 6s. 0d. net, postage 8d.).

Earnings: transition probabilities

The Department of Health and Social Security obtains information on the earnings of individuals from income tax documents in the course of compiling records of graduated insurance contributions because national insurance benefits, both long and short term, are determined by the contribution record of the individual. A standing sample of national insurance records, i.e. all those with N.I. number ending in 14A and 84A, is analysed by age, sex, class of insurance contribution and annual earnings each year. The earnings record has been standardised for each individual by expressing it as a proportion of average earnings of male employees.

By taking two years data together it is possible, for various groups, to cross classify earnings in one year by earnings in the next and obtain transition matrices. Those available for 1964/65 and 1965/66 include:

(*a*) male employees in class 1 insurance who have paid 48 or more contributions, for each age (15–64)

(*b*) spinster employees in class 1 insurance who have paid 48 or more contributions, for each age (15–58)

(*c*) male employees in class 1 insurance who have paid or been credited with 48 or more contributions, for each age (15–64)

(*d*) spinster employees in class 1 insurance who have paid or been credited with 48 or more contributions, for each age (15–58)

The Department has obtained these, and will obtain further matrices, as part of an exercise in forecasting the distribution of standardised earnings over the life of the insured person. As part of the exploration of the stationarity and the order of the process, three sets of transition matrices have been obtained for 1965/66 for people whose standardised earnings (i) increased by more than a certain amount, (ii) decreased by at least that amount, or (iii) varied within these amounts in 1964/65. A comparison for these three sets of tables suggests that the process may be of Markov type, i.e. that predictions may be made by successive applications of only one transition matrix, although this suggestion is less tenable for age less than 40. The row and column distributions of the 1964/65 and 1965/66 matrices are being tested for significance of difference.

The results obtained so far suggest that more information is required before the matrices can be accepted as appropriate to forecasting life earnings. In particular, at least another year's earnings' record is necessary before positive statements may be made about the stationarity of the system. Also the transition probabilities would *a priori* seem likely to be different for manual and non-manual workers but at present there is no occupational information to make this distinction.

Enquiries about the tabulations prepared and the analysis so far carried out should be addressed to the Chief Statistician (Social Security), Department of Health and Social Security, Ivybridge House, 1 Adam Street, London W.C.2. It is unlikely that these will be published in the near future.

PRODUCTION

Reorganisation of industrial statistics

An outline of the new system of industrial statistics was given in an article by J. Stafford, Director of Statistics, Board of Trade, in the first issue of *Statistical News*, page 1.7. The first of the quarterly sales inquiries to be developed under the new system was introduced by the Board of Trade in the fourth quarter of 1968. The trades covered are the printing and publishing of newspapers (Minimum List Heading 485), periodicals (M.L.H. 486) and general printing and publishing (M.L.H. 489).

Over the next three years or so the Government Statistical Service is planning to examine the whole range of industrial statistics and to recast and extend it so as to provide a comprehensive and integrated service for all users of statistics both in government and industry. An important aspect of the reorganisation will be the consideration, industry by industry, with trade associations and others interested, of the requirements for short period – usually quarterly – information about the goods they sell. The lead in these consultations will be taken by Government Departments.

Following the establishment of the inquiry into printing and publishing, the Statistics Division of the Board of Trade is now considering new inquiries for

- general chemicals (M.L.H. 271)
- pharmaceutical chemicals and preparations (M.L.H. 272)
- glass (M.L.H. 463)
- furniture and upholstery (M.L.H. 472)
- bedding (M.L.H. 473)
- rubber (M.L.H. 491)

Announcements will be made about other industries in due course.

Standard Industrial Classification

Comparison of 1958 and 1968 Revisions

A table showing the Minimum List Headings of the recently published Standard Industrial Classification: Revised 1968, (see *Statistical News* No. 3, page 3.20), and the corresponding Headings and sub-divisions of the previous Classification: Revised 1958, with notes on changes in content of the Headings, has been prepared by the Central Statistical Office. This will assist non-Government users of the S.I.C. who may wish to adjust their own records. Copies are available on application to the Information Officer, Central Statistical Office, Great George St., London S.W.1.

Reference

Standard Industrial Classification: Revised 1968, (HMSO) (Price 5s. 6d. net).

Textile machinery and accessories industry

The Ministry of Technology produced in October 1968 the first of a series of statistical surveys covering specific industries. New editions of surveys will be prepared from time to time to include up-to-date data.

Offprints of this survey are available on request from the Ministry of Technology, ES1 Branch, Dean Bradley House, Horseferry Road, London S.W.1 (Telephone: 01–799 5688, Ext. 16).

Local authority design work in construction

Since 1965, the Ministry of Public Building and Works has been collecting data from local authorities on the design work in their offices, including work delegated to architects in private practice. Lady Lea was commissioned to make a preliminary appraisal of the data, and her report was issued by MPBW in the form of a statistical bulletin.

The relationship between the sketch plan and working drawing statistics is described, and separate sections are devoted to building and to civil engineering. An account of the design timetable is given, and the report concludes with an analysis of the relationship between design work and orders for new construction obtained by contractors. The following are some of the main features.

Between 10 and 20 per cent of building projects did not proceed to the preparation of working drawings, or did so only after substantial modification. Civil engineering projects were affected in this way to a much lesser extent.

The average time which elapsed between the initiation of sketch plans and the beginning of construction varied, of course, according to the type of work. For housing, it was nearly 14 months, for education projects 15 months, and for other types of building projects 16 months. On average, sketch plans took about 4 months to prepare, but working drawings needed rather longer. A further 6 months elapsed between the completion of working drawings and the start of construction. Not unexpectedly, projects tended to take longer to design as they increased in value.

Local authorities delegated 25 per cent of housing design work, 33 per cent of education, and 18 per cent of other building design to private architects. The larger projects tended to be delegated more than smaller ones.

A copy of the bulletin can be obtained by writing to Mrs. Ewens, Construction Economics Division, MPBW, Lambeth Bridge House, London S.E.1.

Fuel policy

Mr. C. I. K. Forster, Director of Statistics of the Ministry of Power, submitted a paper entitled 'The Statistical Basis to National Fuel Policy' to the Institute of Actuaries on 27 January 1969. The paper described in detail the statistical and economic analysis carried out for the 1966/67 Review of Fuel Policy which led up to the issue of the White Paper on Fuel Policy in November 1967 (see *Statistical News* No. 1, page 1.24) and the work now in progress on constructing an integrated mathematical model of the energy economy which was outlined in *Statistical News* No. 3, page 3.1. The paper and the discussion at the meeting will be reproduced later in the *Journal of the Institute of Actuaries*.

***Conference on input-output**

The 1968 Manchester Conference on Input-Output was held at the end of October at Holly Royde College under the joint sponsorship of the Econometrics and Extra-Mural Departments, University of Manchester, and the Manchester Business School. It was attended by 80 persons from the universities, industry and commerce and government departments. The Chairman of the conference was Dr. W. F. Gossling (University of Manchester). The proceedings of the conference, including the discussion, will be published in due course. A steering committee under the chairmanship of the director of the conference was elected to pursue the formation of an Input-Output Research Group in the United Kingdom.

An indication of the contents of the six papers read at the conference is given in the paragraphs below.

'Input-output applications in the multi-activity firm' by C. Nelson, Manchester Business School. Based on an actual industrial situation, this paper suggested that input-output analysis could be utilised for financial and resource planning and control purposes by a multi-activity firm which 'sells' to 'customers' at various stages in the production process. The approach might be used to identify bottleneck situations and to provide a systematic framework for a firm's standard costing procedures.

'A linear model of production distribution and growth' by A. Cigno, University of Birmingham. This paper presented a programming model of economic growth which emphasizes the effects of changes in technology and consumer tastes and the role of reinvested profits in financing innovatory investment. The underlying assumption was that not all firms succeed in promptly adjusting their production plans to changes in market conditions and technical know-how. The existence of this time lag is the cause of profits and losses.

The analysis first considered the position of a firm and was then extended to cover an economic system, composed of a number of industries and of a consuming sector. The complete model consisted of a set of dynamic inequalities, and it was shown that their solution was equivalent to the solution of a sequence of dual linear programming problems, where what is maximized is the rate of investment and what is minimized is the rate of saving. The programming approach adopted made this model suitable for empirical applications.

'Production models and time trends of input-output coefficients' by K. J. Wigley, University of Cambridge. The first section of this paper presented over the period 1951–1964, the actual movements of the five fuel input-output coefficients into a sector similar to U.K. manufacturing. A model was developed which combined a linear substitution schedule between fuels in producing output with a lagged relationship between relative fuel price and relative fuel consumption. The second section of the paper integrated an input-output matrix into a general theory of production for an individual branch of production. The argument was tested for a producing sector similar to U.K. manufacturing over the period 1950–1965. A model was developed which gave sensible results for a wide range of sectors. Numerical values for the capital-output ratio on new plant obtained independently in the two sections of the paper agreed surprisingly well.

'Input-output and the trading economy' by J. R. C. Lecomber, University of Cambridge. Over-simple assumptions often render input-output models unsuited to an analysis of the balance of payments or even the domestic economy of a major trading nation like the U.K. The Cambridge input-output model has been modified to include price-sensitive import and export functions and the purpose of the paper was to highlight some methodological problems. Imports of each commodity may generally be explained as log-linear functions of demand and price relative to that of home produced substitutes. Alternative forms of equations were critically examined. Similar relationships were appropriate for exports. An analysis of time series of export matrices cross-classified by commodity and destination was proposed. These, together with relationships governing final and intermediate demands, constitute a model which might be used to provide, at fixed prices, estimates of industry outputs, exports, imports and the external balance.

The paper provided one illustration of the way in which the simple proportionality assumption of input-output models might be replaced by econometrically estimated relationships of a more sophisticated type. The resultant non-linearities, which would have been a formidable obstacle in the early days of input-output, were easily handled by modern high speed computers.

'The use of input-output methods in the DEA' by B. C. Brown, Department of Economic Affairs. An input-output model is used in the Department of Economic Affairs mainly for estimating the industrial pattern of output and employment corresponding to various levels of national output in the early 1970s, and different patterns of distribution of resources between private and public consumption and investment and exports.

The model comprises four main stages: (*a*) the estimation of the commodity composition of final demand; (*b*) estimating demands on home production and imports using the input-output coefficient matrix; (*c*) converting to industry production indices; and

*Indicates that the contribution does not refer to work in the Government service, but is included because of its relevance to Government statistical work.

(*d*) estimating industries' demands for labour. Improvements are needed to all parts of the DEA model and these were explained in the paper. These improvements depend very heavily on research largely carried out outside the government. There is an immediate need for information and estimates on which to base projections of the 1963 input-output coefficients, and a need for better means of estimating the composition of final demand. A suitable set of industry production functions built into an input-output model might make a major contribution to the intractable problem of estimating labour and investment needs for varying rates of growth, as well as making the model more realistic.

'Developments in input-output statistics' by L. S. Berman, Central Statistical Office. This paper was reproduced in *Statistical News* No. 3, page 3.7.

FOOD AND AGRICULTURE

National Food Survey

The seventeenth Annual Report of the National Food Survey Committee was published on 11 November 1968. It deals with household food expenditure, consumption, prices and nutrition in 1966, with a Supplement giving some preliminary results for 1967. Since the results for a single year are subject to short-term fluctuations, including sampling variations, they are considered in the Report in the context of developments since 1960, and some emphasis is given to explaining the changes in the demand for individual foods over this period in terms of price, income and other effects. Many of the changes in average consumption per head reflect changes in consumer tastes rather than in food prices or personal incomes. Between 1960 and 1966, there were increases of 21 per cent in average food expenditure per head and of 17 per cent in food prices, so that the gain in real value of food purchases per head during this period was about 4 per cent, nearly all due to increased purchases of convenience foods.

In addition to the usual tables, showing geographical, social class and family composition differences in food purchasing habits and nutrient intake, the Report includes tables showing estimated average consumption per head of nutrients per thousand kilocalories. The Report also contains a supplementary note on the substitution relationships between the carcase meats, poultry and white fish, and estimates of the standard errors of the annual averages of expenditure, purchases and prices.

The arrangements for the early publication of summarized results of the National Food Survey, and for the supply of unpublished data which may be of interest to those concerned with the home market for food, were outlined in *Statistical News* No. 1, page 1.28.

Reference

Household Food Consumption and Expenditure: 1966 (with a supplement giving provisional estimates for 1967), (HMSO), 1968 (Price 23s. 0d., by post 24s. 2d.).

Mushroom survey, 1967

The Ministry of Agriculture, Fisheries and Food has released a report on the 1967 survey of the mushroom industry, a voluntary postal enquiry carried out in co-operation with the Department of Agriculture and Fisheries for Scotland, the National Farmers' Union and the Mushroom Growers' Association. The Ministry of Agriculture for Northern Ireland supplied additional information from a survey carried out in October 1966. The tables summarized the returns received; the effective response in Great Britain was about 60 per cent but probably approached 75 per cent in terms of cropping area. The report provides information on yields, sales, sales outlets, methods of cultivation, cropping programmes, mechanisation and technical developments, and the permanent and casual labour force. An analysis by cropping area size-group is given for area, number of holdings and sales. Ten growers each with over ½ million square feet accounted between them for almost half the area laid down in Great Britain and over half the production.

Copies of the report are available on request from Statistics Division I (Branch A), Ministry of Agriculture, Fisheries and Food, Great Westminster House, Horseferry Road, London S.W.1.

TRANSPORT

Transport for industry

The Ministry of Transport has conducted a survey of the use made of transport by a selection of establishments in manufacturing industry. The survey was an attempt to look at some features of transport from the outside, from the users' standpoint, and to discover some of the main aspects of the demand for transport of manufacturing industry. Some of the more important findings are published in *Transport for Industry* (*Summary Report*) (HMSO, price 6s. 6d.). A fuller report is to be published as soon as possible.

The inquiry was first planned in the latter part of 1965 and after preliminary investigations the main body of the data was collected in 1966 and 1967. Information was obtained in respect of some 720 establishments in manufacturing industry, including the numbers of persons employed, the nature of the business, the transport facilities at the disposal of the establishment, the tonnage shipped by the various modes of transport and the expenditure on each mode. This information was derived from questionnaires taken by interviewers to each firm or establishment.

The firms included in the survey were asked to distinguish between the several modes of transport used for the carriage of goods despatched from the establishments, namely road hauliers, road vehicles operated on own account, the General Post Office, the railways, canals and coastal shipping.

In addition to this information relating to the whole of the traffic which the selected establishments despatched, the firms were asked to complete special notes in respect of each consignment despatched in a certain period. These notes gave particulars of the type of commodity of which the consignment consisted, the weight, the destination, the mode of transport used and the charge paid in cases in which a carrier for hire was used. Firms were also asked whether each consignment had any 'special features' such as being urgent, requiring the use of the firms' own vehicle, being sent in a container or being an element in a regular flow of goods. About 30,000 consignments were covered.

To obtain additional information special postcards were despatched with each consignment to be filled in by the consignee, stating how quickly the consignment had been delivered and whether it was damaged. By inquiry after the survey it was also possible to discover how many consignments had been lost.

It was not possible to include on the special consignment notes the full range of questions about matters on which was information was desirable. Every tenth note was, therefore, returned to firms, each with a request for an assessment of the charge for sending the particular consignment by the cheapest alternative mode. Although the questions put to the firms were specifically related to the individual consignments a substantial proportion were able to quote the costs by alternative modes for some or all of the consignments concerned, and as a result a great deal of interesting material was obtained about the extent to which firms utilise modes of transport other than the cheapest, and the circumstances in which they do so.

The results of the survey are presented in two parts. Basic tabulations are given showing the general implications of the data. For example, the tables indicate the shares of each mode of transport in the numbers of consignments despatched over various distances, the part played by each mode of transport in the carriage of consignments of various weights, the extent to which consignments of the different types of goods were sent by each mode of transport and the shares of each mode in the total tonnage carried over various lengths of haul. In addition there is information about transit times, damage to and loss of consignments, the numbers of consignments with special features and the proportion of consignments in containers or on pallets.

In addition to these tabulations the report makes an experimental application of a statistical probability analysis. This analysis attempted to isolate the influence of each of the many factors affecting the distribution of traffic between the various modes of transport. The calculations indicate, for example, that on an average view, taken over consignments of all descriptions for which data were available, the effect of relative prices on the mode of transport selected was small. On the other hand the length of haul was of great importance.

Ports

The National Ports Council has published the third issue of its annual *Digest of Port Statistics*. This publication brings together each year a wide range of statistical information about the ports, including the numbers of harbour authorities and other undertakings engaged in harbour operation, the capital expenditure of port authorities, the numbers of employees at the various ports and their earnings, details of the goods passing through each port, and of the countries to and from which the cargoes are consigned, passenger traffic and the movements of shipping at the ports. Where the statistics are available they are given for the last ten years.

In addition to the information which appears regularly there are tables setting out statistics which are available on particular occasions. For example, the *Digest* for 1966 gave particulars of the inland origins of export traffic in 1964, and of the numbers of dry cargo berths at the major ports. The *Digest* for 1968 gives up-to-date information about berths, including details of container and other unit transport berths in operation and under construction, and sets out the results of an inquiry into numbers of employees in the ports in the various categories of age, salary and occupational grade.

The publication is available from Her Majesty's Stationery Office and from the Council's headquarters at 17 North Audley Street, London W.1. (Price 45s. 0d.).

HOME AND OVERSEAS FINANCE

Local authority loan debt

As described in *Statistical News* No. 2, page 2.26, an inquiry was carried out in 1968 into the amounts of loan debt of local authorities in the United Kingdom outstanding at the end of the financial year 1967/68. Results of the Survey were published as Supplementary Tables in the January 1969 issue of *Financial Statistics*, and an article describing the Survey was included in the January 1969 issue of *Economic Trends*.

Films and television material – overseas transactions

Some of the results of the statistical inquiry by the Board of Trade into overseas transactions in respect of the production and exhibition of cinematograph film and television material in 1967, the main purpose of which was to provide statistics for balance of payments purposes, were given in the *Board of Trade Journal*, 6 December 1968. The information sought was the same as in the previous inquiry for 1966, reported in the *Board of Trade Journal*, 3 May 1968.

Cinematograph film producers and distributors. The basis of the register of this part of the inquiry was described in detail in the *Board of Trade Journal*, 6 January 1967. This register was brought up to date by using a list of producers and distributors who registered British films with the Board of Trade in 1967. Completion of the forms in this inquiry was obligatory under Section I of the Statistics of Trade Act, 1947, and returns were received from virtually all of the 157 firms to whom forms were sent. Of the firms approached, 31 had no overseas transactions in the year to report.

Television material. The returns in this inquiry from the BBC and the independent television programme contractors showed a rise in the surplus of receipts over payments between 1966 and 1967 from £1·5 million to £2·7 million. Receipts rose from £5 million in 1966 to £6·2 million in 1967 while payments remained unchanged. The rise in receipts occurred in most areas, North America maintaining its position as the principal customer with just under half of total receipts coming from that area.

NATIONAL INCOME AND EXPENDITURE

Rebasing constant price estimates

The base year for the estimates of expenditure on the gross domestic product and output at constant prices is determined by the year of the detailed census of production. The detailed results of the 1963 census of production are now becoming available and preparations are being made for changing the base year from 1958 to 1963. Estimates for the fourth quarter of 1968 will probably be the last to be prepared on the 1958 base. The present intention is to publish in the April 1969 issue of *Economic Trends* revised quarterly series based on 1963 for the years 1958 to 1968, in order to provide as soon as possible a long run of figures related to the new base year. The monthly index of industrial production, which forms part of the output estimates of gross domestic product at constant prices, will be rebased at the same time.

PRICES

Wholesale price indices

A new series of wholesale price index numbers based on 1963=100 is now available and supersedes the series which has been published hitherto on the base 1954=100.

The new series was introduced in the *Board of Trade Journal*, 14 February 1969, and the annual average index numbers for each year since 1963 are given together with monthly figures from January 1968. Monthly figures prior to January 1968 will not be published but will be supplied on request so far as they are available.

Since the wholesale price index numbers are used in long term contracts to take account of changes in cost of materials, the Board of Trade will continue to publish the indices of materials purchased by broad sectors of industry on the base 1954=100, at least until December 1971. Requests for the continued publication of other series on this basis will be considered.

The new series is based on average prices in 1963 and is constructed according to the pattern of materials purchased and manufactured products sold during that year as recorded in the census of production. A detailed explanation of this rebasing is given in the *Board of Trade Journal*, 21 February 1969.

Any enquiries arising from the publication of the revised series should be sent to the Board of Trade, Statistics Division, Room 620, Sanctuary Buildings, 20 Great Smith Street, London S.W.1 (Telephone: 01-222 7877, Ext. 3411).

NATIONAL BOARD FOR PRICES AND INCOMES

Office staff employment agencies

The National Board for Prices and Incomes reported in November 1968 on *Office Staff Employment Agencies' Charges and Salaries.* The reference was confined to agencies in the London area. The Report gives the results of a sample survey covering 68 agencies. The survey was in two parts, first on the level of charges, methods of charging and accounts, and secondly on the earnings of the main categories of temporary and permanent office staff employed or placed by agencies.

Reference

Office Staff Employment Agencies' Charges and Salaries, National Board for Prices and Incomes, Report No. 89, Cmnd. 3828 (HMSO), November 1968 (Price 3s. 6d.).

London taxicab fares

The National Board for Prices and Incomes in October 1968 reported on the *Proposed Increase in London Taxicab Fares.* The Report contains the result of two surveys of London taxis conducted by the N.B.P.I. One covers the methods of operation of 78 fleet owners with 10 or more cabs. The other gives various general and operating statistics for a sample of 255 owner drivers holding 'general' licences.

Reference

Proposed Increase in London Taxicab Fares, National Board for Prices and Incomes, Report No. 87, Cmnd. 3796 (HMSO), October 1968 (Price 3s. 6d.).

Housing

In April 1968 the National Board for Prices and Incomes reported on *Increases in Rents of Local Authority Housing.* For this Report, the N.B.P.I. carried out two inquiries, a general enquiry into all authorities' rent increases and a detailed enquiry into tenants' rent and incomes in 20 of the 22 authorities named in the Reference to the N.B.P.I. for particular study. A Statistical Supplement to the Report containing the full results of these surveys was published in October 1968.

General inquiry into increases in local authority rents. The N.B.P.I.'s sample enquiry into the levels of and increases in the average rents charged by local authorities in Great Britain was carried out in January 1968 and covered 1,193 authorities with 500 or more dwellings at 31 March 1966, but excluded authorities named in the reference as these were the subject of a separate survey. In the selection of the sample the authorities were stratified by size (based on number of dwellings) within type of authority, with sampling fractions varying from complete coverage to 1 in 4. Returns were received from 365 of the 391 authorities representing 94 per cent of the dwellings in these authorities. The results published include information on the number of rent increases planned for or after 1 January 1967, the dates when authorities last increased rents, authorities policy on phasing increases, the size of rent increases, rent rebate schemes and authorities reasons for requiring a rent increase.

Survey of tenants' rents and incomes. In January 1968, the N.B.P.I. carried out a survey of tenants' rents and incomes in 20 of the 22 authorities named for the reference. Two authorities were excluded from the survey as they had recently carried out similar enquiries. Authorities were asked to select a sample of tenants from their rent roll at intervals varying from 1 in 50 in the largest authorities to 1 in 5 in the smallest. The questionnaires for the survey were in two parts. The first which asked for details of rents was completed by the local authority. The second which asked for details of tenants' current incomes and the composition of the household was completed by the tenants and returned direct to the Board. All the authorities completed the returns of rents. Usable replies from tenants totalled 61 per cent of the sample.

To examine the ability of tenants to pay rents and the need for rebates, the Ministry of Housing and Local Government illustrative rent rebate scheme was applied to each tenant with the exception of tenants receiving supplementary benefits from the Ministry of Social Security or sickness or unemployment benefits. The rebate scheme was applied both to standard rents operating at January 1968 and to an estimated historic cost rent for each tenant for the year 1968/69. The results also provide details of the composition of rent and rate payments, the characteristics of households, the make-up of tenants' incomes and its relationship to rent in the 20 named authorities.

References

***Increases in Rents of Local Authority Housing*, National Board for Prices and Incomes, Report No. 62, Cmnd. 3604 (HMSO), April 1968 (Price 8s. 6d.); Report No. 62 (Supplement), Cmnd. 3604–1 (HMSO), October 1968 (Price 16s. 0d.).**

Operatives in construction

In November 1968 the National Board for Prices and Incomes reported on three references, on Pay and Conditions of Operatives in Building, in Civil Engineering, and in other parts of the Construction Industry respectively. For the purpose of these reports the N.B.P.I. carried out a nation-wide survey of pay and conditions in both the private and public sectors of the construction industry. The results of the survey are contained in the body of the Reports and in their Statistical Appendices. The results of two separate smaller surveys into Pay and Conditions of Operatives in Sawmilling and the Thermal Insulation Contracting Industry are also contained in the third of these Reports on the Construction Industry. The N.B.P.I. is planning to publish by early March 1969 a Statistical Supplement to the three Reports showing fuller results of the survey of the Construction Industry. The main survey was in two parts: general questionnaire addressed to firms and public authorities about conditions of work and a questionnaire on hours of work and pay of operatives for a week in July 1968. Firms with fewer than two operatives were excluded from the full surveys.

The sampling frame for the private sector was provided by the Ministry of Public Building and Works who issued the forms on behalf of the N.B.P.I. Over 3,400 or 60 per cent of the 5,700 firms (or establishments) selected in the sample responded to the enquiry. The returns covered 7 per cent of all firms in the industry.

For the survey of earnings employers were asked to sample varying proportions of operatives depending on the size of the organisation and the number of establishments with separate payrolls. The returns covered 31,000 workers working a full week or 1 in 30 of the estimated total number of operatives.

A similar survey was carried out for operatives employed in local authorities, the health services, the Ministry of Public Building and Works and water undertakings. This survey covered 4,200 authorities (or depots) and 9,700 or 1/22nd of the total number of operatives.

The analysis of conditions show the type of holiday pay, the use of payment by results schemes, profit sharing schemes and the proportion of operatives covered by pension schemes. The analysis shows the number of firms or authorities by size and the number of operatives affected.

The analysis of pay provides details of the composition of hours of work and of earnings, numbers in ranges of earnings within ranges of hours and in ranges of basic pay within ranges of conditioned hours and numbers in ranges of bonus earned. There is a very full analysis by occupation and grade within industry by type of work, size of firm and region, of which summaries are contained in the Reports.

References
Pay and Conditions in the Civil Engineering Industry, National Board for Prices and Incomes, Report No. 91; *Pay and Conditions in the Building Industry,* Report No. 92; *Pay and Conditions in the Construction Industry other than Building and Civil Engineering* Report No. 93; (Cmnd. 3836, Cmnd. 3837 and Cmnd. 3838 (HMSO), November 1968 (Prices 7s. 0d., 8s. 6d. and 6s. 6d. respectively).

Distributors' costs and margins
The National Board for Prices and Incomes in December 1968 reported on Distributors' Costs and Margins on Furniture, Domestic Electrical Appliances and Footwear. The report includes a number of tables and analyses based on five postal enquiries carried out by the N.B.P.I. into the retail and wholesale trade in these products.

The sample of retailers was based on Board of Trade lists and was drawn in two parts: multiple and independent organisations. A two-stage stratified random procedure was adopted to obtain a sample of shops belonging to multiples – firstly by selecting a sample of head offices of organisations and secondly by selecting a sub-sample of shops from each organisation selected. The sampling fraction of head offices varied from full coverage to 2 in 5 according to the number of shops within an organisation and the reference product; for shops the sub-sample ranged between 2 to 5 shops per multiple according to the size of the organization. The stratified random sample of independent retailers was drawn direct from the Board of Trade lists and varied between $1\frac{1}{2}$ and 5 per cent of all establishments according to size of town and type of product.

The enquiries made of wholesalers were compatible with those in the retailing survey to enable comparisons to be made between the two sectors of the trades but since wholesaling is negligible in the furniture trade the survey was confined to domestic electrical appliances and footwear. In the absence of any reliable comprehensive lists of wholesalers the sampling frames were compiled from various sources by the Board. Sampling fractions of between full coverage and 1 in 4 were adopted for electrical wholesalers and of 2 in 3 or 1 in 2 for footwear according to size and region.

The analysis covered over 500 returns from retailers and about 90 from wholesalers. The tables show samples and response rates; average income, costs and margins, by type of organisation and type of product – with standard errors; ranges of percentage mark-ups on retailers' costs by type of retailer and by specified products; sales of products by type of outlet, by range of selling price and of recommended price; and a survey of shop rents of independent retailers. An appendix deals with a statistical analysis of margins. This tests by regression methods hypotheses about the determination of margins and individual components of costs.

Reference
Distributors' Costs and Margins on Furniture, Domestic Electrical Appliances and Footwear, National Board for Prices and Incomes, Report No. 97, Cmnd. 3538, (HMSO) December 1968 (Price 8s. 6d.).

Payment by results
The National Board for Prices and Incomes in December followed up its Report published in the previous May on *Payment by Results Systems* with a Supplement to that Report. The Supplement described in more detail the case studies conducted by the N.B.P.I. into various payment by results schemes. There are also some general chapters, which include a further note on wage drift. This note describes the history of drift measurement in Britain and Scandinavia. It also examines in more detail the appropriateness of three alternative methods of measuring wage drift and argues that this depends on the way changes in basic rates or minima affect earnings. The N.B.P.I. in the light of new information has revised its own estimate of wage drift in 1963 to 1966 from 4 per cent to $3\frac{1}{2}$ per cent, compared with the D.E.P.'s estimate (on a different basis) of 2 per cent.

Reference
Payment by Results Systems (Supplement), National Board for Prices and Incomes, Report No. 65 (Supplement), Cmnd. 3627 –1 (HMSO), December 1968 (Price 10s. 6d.).

Job evaluation
The National Board for Prices and Incomes in September, 1968, reported on Job Evaluation, and a Supplement to their Report was published in December. Job Evaluation is described as the comparison of jobs to determine their places in a job hierarchy, offering a more rational basis for a pay structure than with traditional systems; the Report describes the four main systems in use and new methods being developed.

The Report referred to the results of a nation-wide statistical survey carried out by the N.B.P.I. in addition to descriptions of certain British and foreign industry-wide schemes, two national schemes and a number of detailed case studies. The survey and these studies are described in more detail in the Supplement. The statistical survey was the first general survey of the use of job evaluation schemes to be undertaken on such a scale. The sampling frame was that of the then Ministry of Labour's monthly enquiry into earnings, and the forms were posted in June 1967 by the Ministry, on behalf of the N.B.P.I.

The sample covered 7,700 establishments, firms or other organisations in Great Britain with 25 or more employees in Index of Production industries, transport, communications and a few services (e.g. laundries, garages). Returns were received from 5,000 establishments, a response rate of 65 per cent.

After grossing to allow for the sample fractions, the coverage was about 16,250 establishments (with 6·4 million employees), of which 9 per cent (with 23 per cent of the employees) had their pay grade determined by job evaluation and a further 7 per cent of firms were considering plans for schemes which might cover a further 10 per cent of employees.

The analyses showed the classes of workers in total and within job evaluation schemes, the type of scheme used, its date of introduction, whether or not consultants had been used, the degree of success and what payments other than the job-evaluated rate determined the wage structure. The results were classified within industry and size of firm or establishment.

References
Job Evaluation, National Board for Prices and Incomes, Reports No. 83 and 83 (Supplement), Cmnd. 3772 (HMSO) September 1968 and Cmnd. 3772–1 December 1968 (Prices 5s. 6d. and 6s. 6d.).

PLANNING

Office development

A new series of statistics, derived from the administration of the Control of Office and Industrial Development Act 1965, was introduced by an article in the *Board of Trade Journal*, 27 September 1968.

Quarterly and annual figures of the number and floor area of office development permits issued by the Board of Trade since the Act came into force in August 1965 are shown. Figures are also given of the floor area of offices which applicants for permits stated were being demolished or converted from office to non-office use. An analysis by regions is shown; initially the control covered only the London Metropolitan Region but the West Midlands Conurbation was soon added and later, in July 1966, the remainder of the South East and West Midland Planning Regions, together with the East Midland and East Anglia Planning Regions were brought under control.

The statistics are consistent with and augment figures published by the Board of Trade in the three annual reports on the 1965 Act, relating to the period August 1965 to 31 March 1966 and the years ended 31 March 1967 and 1968.

Floor space in industrial, shopping and office use

The first bulletin under the general title *Statistics for Town and Country Planning* was published by HMSO in January. This bulletin is the first issue of Series II which is to deal with floor space. Series I will cover statistics of decisions on planning applications (hitherto published separately as such) and it is intended that other series covering topics relevant to planning should be published in due course.

The floor space material now published has been prepared by the Ministry of Housing and Local Government from Inland Revenue data obtained in the preparation of Valuation Lists and deals with the changes in floor space in industrial, shopping and office use which took place between 1 April 1964, when the collection of this information began, and 31 March 1967. Analysis is given by region, regional sub-division and planning authorities within England and Wales. Statistics are not available for Great Britain as a whole because of basic differences on the method of compiling valuation lists for Scotland.

The next issue in the series will include the results of a total count of floor space in selected use classes at 1 April 1967. Further bulletins in this series, presenting annual changes, will be issued as the data become available.

Reference
Statistics for Town and Country Planning: Series 11, *Floor Space,* No. 1, *Floor Space in Industrial, Shopping and Office Use: Changes April 1964 to March 1967,* (HMSO), February 1969.

The Land Commission

The First Report and Statement of Accounts presented by the Land Commission covers the period from 1 February 1967 to 31 March 1968. In addition to the Land Acquisition and Management Fund Account and the Betterment Levy Account it includes statistics of betterment levy charged, net receipts, rates of interest chargeable on unpaid amounts of betterment levy, levy overdue at 31 March 1968 and cases of disputed liability and delayed collection. A table shows the number of Land Commission staff at 31 March 1968.

Reference
Report and Accounts of the Land Commission for the year ended 31st March 1968, HMSO 358 (Price 4s. 6d. net).

INTERNATIONAL

Comparisons of public expenditure

In answer to two recent parliamentary questions, some new international comparison of public expenditure have been given in Hansard.

The definition of public expenditure used in the United Kingdom and given in the National Income Blue Book (Table 53 of the 1968 edition) covers current and capital expenditure of central government, local authorities and nationalised industries and other public corporations. Such comprehensive figures are not available for other countries and the widest definition which can be obtained from the returns made to the OECD is current expenditure of general government (equal to central government and local authorities in the United Kingdom accounts) together with capital expenditure on fixed investment and stocks by general government and public corporations. This definition excludes expenditure on capital grants, lending and purchase of company securities and other financial assets. On this basis, annual rates of growth and the size of public expenditure in relation to gross national product at factor cost were given for the United Kingdom, USA, Japan and France in Hansard, 17 December 1968 (Written answers, cols. 326 – 328). Corresponding figures for the United Kingdom and West Germany were given on a narrower basis of public expenditure, excluding capital expenditure on fixed investment and stocks by public enterprises, which was not available from the OECD return for West Germany. A still narrower basis of public expenditure, which covers only current expenditure of general government, is given in the OECD publication based on the returns, of which the latest is *National Accounts of OECD countries*, 1957–66. This edition, in two new sections, *inter alia* relates total current expenditure of general government to gross national product at market prices and gives total current expenditure of general government as an index based on 1958.

On the widest definition of public expenditure which it is possible to use for international comparisons, the figures in Hansard show United Kingdom expenditure greater in relation to gross national product than that of the USA and Japan, but less than that of France. The nearest comparable figures for West Germany exclude the important category of investment by public enterprises; on this basis the figures show United Kingdom public expenditure smaller in relation to gross national product than that of West Germany.

Even when prepared on comparable definitions, however, international comparisons of public expenditure cannot be wholly satisfactory because they are affected by institutional arrangements, and the extent to which receipts are netted off expenditure. The comparisons are affected further by differences in the importance of state ownership of enterprises, including the extent to which housing is provided by the public sector. Also, the comparison of public expenditure, covering current transfers as well as expenditure on goods and services, with gross national product gives only an approximate measure of its importance; the two aggregates are not comparable in so far as public expenditure includes expenditure on transfers which do not enter into gross national product (that is, the total value of goods and services becoming available to the nation from productive activity).

A comparison of public expenditure on goods and services only with the gross domestic product at factor cost was given for the United Kingdom, USA, Japan, West Germany, France and Italy in Hansard, 5 November 1968 (Written answers, col. 53). Because of the lack of figures in some cases for capital expenditure on fixed investment and stocks by public enterprises figures were given both including and excluding this expenditure. The OECD publication, referred to above, also gives figures for current expenditure on only goods and services by general government, relating the expenditure to gross national product at market prices and providing an index for the value of expenditure based on 1958.

OECD surveys of research and development

A meeting arranged by the Directorate for Scientific Affairs of the OECD to revise their 1963 manual *Proposed standard practice for surveys of research and development* (see *Statistical News* No. 3, page 3.34) met from the 2–6 December 1968 at Frascati, Italy, under the chairmanship of Mr. H. E. Bishop (U.K. Central Statistical Office). Experts from twenty nations were present. The United Kingdom was represented by Mr. A. J. Boreham (Ministry of Technology). Mr. C. Freeman of the Science Policy Research Unit, University of Sussex, and Mr. D. Harris (U.K. Central Statistical Office) attended as consultants to OECD.

Postal statisticians

At a meeting in September in Moscow of the Postal Studies Committee of the Universal Postal Union, Mr. S. Wood, Director of Statistics and Business Research of the British Post Office, proposed on behalf of Great Britain that an international symposium of postal statisticians be held. There was unanimous support from the countries present. The British Post Office would be the hosts; the timing and the details would be agreed with the International Bureau of the UPU and the Russian Chairman of the committee section concerned.

The British Post Office was among the first to employ professional statisticians. Now many Post Offices either have professional staff or use the consulting services of universities. Considerable experience in statistics applied to postal problems is being built up, and therefore the time for such an exchange is opportune. An article by Mr. Wood on Statistical and Business Research in the British Post Office appears on page 4.1 of this issue of *Statistical News*.

INFORMATION SERVICES

***Survey of collections of economic statistics**

A Joint Working Party of the Library Association and

*Indicates that the contribution does not refer to work in the Government service, but is included because of its relevance to Government statistical work.

the Royal Statistical Society is engaged in organising a survey of collections of economic statistics in libraries and other organisations in the U.K., supported by a research grant of £5,204 over two years from the Office for Scientific and Technical Information.

The project arose from a Conference on Librarian-Statistician Relations in the Field of Economic Statistics, arranged by the two sponsoring bodies jointly in 1965 under the chairmanship of Professor R. G. D. Allen. From this it was clear that research workers were frequently unaware of existing collections of materials in their field; and that, in the light of the concentration of collections in London, little information was available on the extent of economic statistics collections in the country as a whole, and the degree to which the existence of these could reduce the necessity for research workers to make frequent visits to London.

Preliminary analysis and a pilot survey have now been carried out and the main survey is to be conducted throughout 1968/69 at the Queen's University of Belfast by Mr. P. R. Lewis, Lecturer in the School of Library Studies and formerly Head of Bibliographical Services in the Board of Trade Library.

The end-product of the survey is to include a directory of about 3,000 companies, associations and other organisations having collections of economic statistics available for research purposes; and a 'union list' of significant serial publications containing economic statistics, giving details of their availability in about 500 libraries throughout the country.

Reference
Conference on Librarian-Statistician Relations in the Field of Economic Statistics (Library Association) 1966 (Price 40s. 0d.).

PUBLICATIONS

***National Institute for Economic and Social Research**

The November 1968 issue of the *National Institute Economic Review* included articles on 'The short-term effects of tax changes' by J. R. Shepherd and M. J. C. Surrey of the Treasury, 'Regional problems and regional policy' by Professor A. J. Brown of the University of Leeds, and 'Wage-rates, earnings, and wage-drift' by C. Gillion of the New Zealand Institute of Economic Research. (Copies of this issue can be obtained from The National Institute Economic Review, 2 Dean Trench Street, Smith Square, London S.W.1. Price 15s. 0d.)

The article on tax changes is a sequel to an earlier one by W. A. B. Hopkin and W. A. H. Godley ('An analysis of tax changes', *National Institute Economic Review*, May 1965), which dealt in some detail with the direct effects of changes in taxation on the main aggregates in the national accounts over a period of eighteen months or two years. The new article is primarily concerned with the estimation by means of a set of equations of the indirect effects which follow from the direct effects. A hypothetical example suggests that, in all, reductions of 6d. in the standard rate of income tax and 3d. in both reduced rates for the financial year 1968–69 would, if announced in April 1968, have increased gross domestic product in 1969 by about £50 million a quarter at 1968 prices, although they would have worsened the balance of payments on goods and services by between £20 million and £25 million a quarter.

The article on regional matters describes results so far achieved in the National Institute's study of regional economic development in the United Kingdom, which is supported by a grant from the Department of Economic Affairs. It is concerned with five main topics: first, the waste of human resources involved in regional differences in the labour market; secondly, regional differences in real income; thirdly, regional differences between growth rates of industrial employment; fourthly, the inter-regional movement of population and of job opportunities; and finally the effects of recent government policies on the distribution of industry and employment.

Provisional conclusions are that the greater part of the unemployment differences and probably a good deal of the differences in output per head and average hourly earnings are explained by differences in pressure of demand, which is itself largely attributable to industrial structure. The Distribution of Industry policy has probably played a major part in diverting growth from the South East and Midlands to the 'peripheral areas' of the country, and by 'bringing the work to the workers' it has certainly moderated regional differences in demand. But, because differential subsidies in the development areas have been applied much more heavily to capital than to labour, they may have tended to segregate the most capital-intensive industries in the assisted areas, where labour is less scarce, and the labour-intensive ones outside them.

The third article describes an attempt to establish by regression analysis the form of the relationships which determine quarterly changes in wage rates and average earnings in the United Kingdom. In its broad approach it follows a study – one of a number of earlier articles in this field – by L. A. Dicks-Mireaux and J. C. R. Dow ('The determinants of wage inflation: United Kingdom 1946 to 1956', *Journal of the Royal Statistical Society*, 1959), who postulated that the wage increase obtained by any group of employees was determined by the excess demand for labour at the time of negotiation, together with the change in retail prices since the previous negotiations. But it

*Indicates that the contribution does not refer to work in the Government service, but is included because of its relevance to Government statistical work.

also examines the effects of introducing an index of capacity utilization, the rate of change of unemployment and a real wage adjustment process.

As in previous studies, the level of unemployment (though not its rate of change) is found to have a strong influence on wage rates, a 1 per cent change in the unemployment rate being associated with a change of 3 per cent in the movement of wage rates. Equilibrium real wages appear to increase by about 2 per cent a year as a result of productivity changes, with actual wage rates adjusting to this equilibrium by about 25 per cent of the gap between actual and equilibrium wage rates each quarter. A fall of 1 per cent in normal weekly hours adds perhaps $\frac{2}{3}$ per cent to the increase in hourly wage rates.

A 1 per cent increase in hourly wage rates appears to lead to about a $\frac{2}{3}$ per cent increase in average hourly wage earnings and to a slightly smaller increase in total average earnings (including salaries) over the same quarter and the following quarter. In addition, however, there is evidence of a trend which adds $3\frac{1}{2}$ per cent a year to wage earnings and $2\frac{1}{2}$ per cent a year total earnings. These results are compatible with the view that in the long run a 1 per cent increase in wage rates leads to an increase of 1 per cent or more in average earnings, with some salary earners affected but, in the short run, not all wage earners. It seems that a fall of 1 per cent in unemployment adds $2\frac{1}{2}$ per cent a year to the rise in hourly wage earnings and 1·8 per cent to the rise in total average earnings, but that neither the level of unemployment nor the movement of prices significantly affects the relationship between wage rates and earnings.

Social Science Research Council

The fourth *SSRC Newsletter* (November 1968) contained a more detailed report on the June Conference on Social Indicators referred to in *Statistical News* No. 3, page 3.24. The *Newsletter* also gives statistics of the 1968 distribution of the SSRC's awards for postgraduate training in the social sciences, and two notes on the SSRC Data Bank at Essex University. The first note by Professor A. M. Potter, the Director of the Data Bank, is on safeguards for depositors and some of the benefits they may receive. The second note by Dr. D. J. G. Farlie, the Deputy Director, refers to some of the first research arising from the services to data users.

Another note, on Market research in the public sector, by Gerald Hoinville, a Director of Research Services Ltd., describes some of the market research undertaken for local and central government, nation-a'ised industries and Royal Commissions, and refers to a Conference held in November by the Market Research Society and the GLC on research for national and local government.

Reference

SSRC Newsletter is issued free three times a year and may be obtained from Publications Department SSRC, State House, High Holborn, London W.C.1.

Statistical classification for imported goods and for re-exported goods, 1969

A revised edition of the *Statistical Classification for Imported Goods and for Re-exported Goods* has been issued for the guidance of users of the statistics (and may be obtained directed from HMSO, or through any bookseller, price 14s. 6d.). This classification sets out the descriptions (and the related code numbers) under which goods imported into, or re-exported from, the United Kingdom or the Channel Islands are classified for the purposes of the published external trade statistics.

All information about statistical requirements on import entries, the forms to be used, etc., is contained in *HM Customs and Excise Tariff.*

Electronics industry

Electronics Industry Statistics and Their Sources, Economic Development Committee for Electronics, November 1968, is available free from National Economic Development Office, Millbank Tower, 21/41 Millbank, London, S.W.1. This is a continuation of the series of statistics begun by the Ministry of Aviation in their publication *Basic Statistics of the Electronics Industry* and continued by the Electronic EDC in their reports *Electronics and the Future* (April 1966) and *Statistics of the Electronics Industry* (June 1967) which was prepared by the statistics working group of the EDC. It incorporates the additional information now collected by the Ministry of Technology, and the figures will also form the basis of statistics submitted to NEDO.

Commonwealth and sterling area Statistical Abstract : last issue

The 88th issue of *The Commonwealth and the Sterling Area Statistical Abstract* was published in December 1968 for the Board of Trade by HMSO (Price 14s. 0d. net, 14s. 8d. including postage).

This publication summarizes the external trade of the Commonwealth and sterling area countries individually and as a group, showing the movement of goods to and from other parts of the world up to the end of 1967.

When it was first published, and for many years afterwards, the *Abstract* was the only compendium of international statistics of any kind, but now wide coverage contained in the *Abstract* can now be obtained from is given, particularly to trade statistics, by international bodies, and, in addition, many aspects of Commonwealth trade are covered by the Commonwealth Secretariat's publications. Because much of what is these other sources, the Board of Trade has decided to discontinue the *Abstract* after the 1967 edition.

GOVERNMENT ECONOMIC SERVICE

Head of the Government Economic Service

On 31 December Sir Alec Cairncross gave up his post in the Treasury as head of the Government Economic Service in order to take up his appointment as Master of St. Peter's College, Oxford. During his seven years at the Treasury Sir Alec has been actively interested in the development of economic statistics for the purposes of analysis and forecasting. He has also taken a great deal of interest in the development of *Economic Trends* in its present form.

Sir Alec Cairncross has been succeeded by Sir Donald MacDougall, formerly Director General at the Department of Economic Affairs, who also becomes Chief Economic Adviser to the Treasury. Mr. Bryan Hopkin of the Ministry of Overseas Development has moved to the Department of Economic Affairs in Sir Donald's place.

GOVERNMENT STATISTICAL SERVICE

Appointments

MINISTRY OF OVERSEAS DEVELOPMENT

Mr. K. V. Henderson, a Chief Statistician in the Ministry of Technology, will become Director of the Statistics Division in the Ministry of Overseas Development on the retirement of Mr. C. H. Harvie at the end of June.

BOARD OF TRADE

Mr. B. A. Wainewright has been promoted to Chief Statistician.

DEPARTMENT OF ECONOMIC AFFAIRS

Mr. J. D. Wells, a Statistician in the Ministry of Power, has been appointed to the Chief Statistician post previously held by Mr. B. C. Brown.

TREASURY

Mr. G. A. Dean has been promoted to a new Chief Statistician post concerned with statistics of public expenditure.

Business Statistics Office

The Business Statistics Office came into being on 1 January 1969 as a development of the Board of Trade Census Office.

Over the next few years the Office will be responsible for implementing the new system of industrial statistics described by J. Stafford, Director of Statistics, Board of Trade, in the first isssue of *Statistical News*, and for building and maintaining a Central Register of Businesses which will in due course replace the various registers at present held by different Departments. Eventually, it will become the main agency for collecting and publishing industrial and commercial statistics. The first task of the Office will be to conduct the Census of Production for 1968.

The Office will initially be located at Eastcote· During February it will take delivery of an ICL 1905F computer with a 48Kword core store (equivalent to 192K characters). The configuration will consist of two paper tape readers and one punch, two 1,350 line per minute printers, two exchangeable disc stores, eight 160Kc magnetic tape units, and two seven track 60Kc magnetic tape units. These latter units will provide data interchange facilities withother installations.

The Business Statistics Office will be staffed and run by the Board of Trade but will be directed by an inter-departmental committee under the chairmanship of the Director of the Central Statistical Office. Mr. M. C. Fessey is Director of the new Office and his deputy is Mr. H. E. Browning.

Reduction of form filling

As an outcome of a continuing review of its statistical returns, with the aim of reducing the general burden of form filling, the Department of Employment and Productivity has decided to suspend three particular annual enquiries during 1969. These are the surveys of numbers employed in manufacturing industries, analysed by occupation (other than engineering and other metal-using industries – S.I.C. 1958 Orders VI to IX, for which the returns will continue); the survey of numbers employed in retail establishments, analysed by occupation; and the corresponding survey of the earnings and hours of sales staff in these establishments. Whether it will be necessary to resume these surveys in 1970 will depend on whether satisfactory equivalent information can be obtained from the new earnings survey (see *Statistical News* No. 1, page 1.23), and the position will be reviewed later in 1969. If the new earnings survey is successful, it may also be possible to prune other regular surveys. Discussions to examine the possibilities have been initiated with the Confederation of British Industry, the Trades Union Congress and the National Board for Prices and Incomes.

Central Statistical Office: Ministerial responsibility

The following is extracted from Hansard, 4 February 1969, col. 64:

'*Q7. Mr. Molloy* asked the Prime Minister what consideration he has given to the question of ministerial responsibility for the Central Statistical Office; and if he will make a statement.

The Prime Minister: I have continuously re-examined this question since the Government's statement of April, 1967, on the Ninth Report from the Estimates Committee. As the House knows, there have been considerable advances in the coverage of work of the Central Statistical Office, but I am more than ever convinced that it is right that it should continue to be centrally located in the Cabinet Office, reporting to the Prime Minister.'

Alphabetical Index

The index to *Statistical News* is cumulative. Page numbers are prefixed by the issue number e.g. 1.23 signifies issue number 1, page 23.

Generally speaking articles relating to United Kingdom, Great Britain, England Wales or covering several geographical groups will not be indexed under these groups, but topics with a significant regional interest will be indicated e.g. regional earnings. Articles and notes dealing particularly with Scottish statistics will be indexed under 'Scotland' as well as the topic, e.g. 'Scotland, population projections', and similarly for Wales and Northern Ireland.

The following conventions have been observed in printing this index: capital letters are used when referring to articles appearing in *Statistical News*; italics are used for the titles of published books or papers.

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Posts in the Government Statistical Service

Posts are available at Assistant Statistician and Statistician level in a number of Departments. The arrangements for appointments in 1969 are:

Assistant Statisticians

Appointment by interview through the Civil Service Commission. The main selection boards are held in March/April (closing date for application 3rd March), but further boards will be held in the summer and late autumn. Age: 20–27. Qualification: first or second class honours degree in statistics or in another subject with substantial statistical content, or other statistical qualification of equivalent standard. Salary scale: £1,145–£1,865 with starting point according to age and experience.

Cadet Statisticians

Honours graduates interested in statistical work may be selected as Cadet Statisticians and take a one-year diploma or Master's course in statistics. On satisfactory completion of the course they are appointed as Assistant Statisticians. Age: 20–26. Salary during Cadet year £830 (outside London) plus payment of course fees. Closing date for 1969 applications 3rd March.

Statisticians

Appointment by interview through the Civil Service Commission. Interviews are held on a continuing basis as necessary. Minimum age normally 28, but down to 26 in exceptional cases. Qualification: honours degree with substantial statistical content or other qualification of equivalent standard; substantial experience of statistical work. Salary: £2,600–£3,550 with starting point according to age and experience.

Full details are available from the Civil Service Commission, 23, Savile Row, London, W.1.

In addition temporary or fixed-term appointments (with the opportunity of transferring to permanent appointments at a later stage if desired) are made by individual Departments. Notices of vacancies are published in the national press.

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