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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. 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. 3

Developments in British official statistics

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Contents

NOTES ON CURRENT DEVELOPMENTS

An integrated mathematical model of the fuel economy

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The following account of the mathematical model of the fuel economy being developed in the Ministry of Power is an abridgement of a talk given by the authors to the Parliamentary and Scientific Committee (an unofficial group of members of both Houses of Parliament and representatives of certain scientific institutions).

Introduction

We begin by explaining our aims in constructing the model – what we expect it to do and what we do not expect it to do. We then say something about the general form which the model is taking at this stage, indicating how far we have got and what our ideas are for further development and conclude by describing briefly some of the technical features.

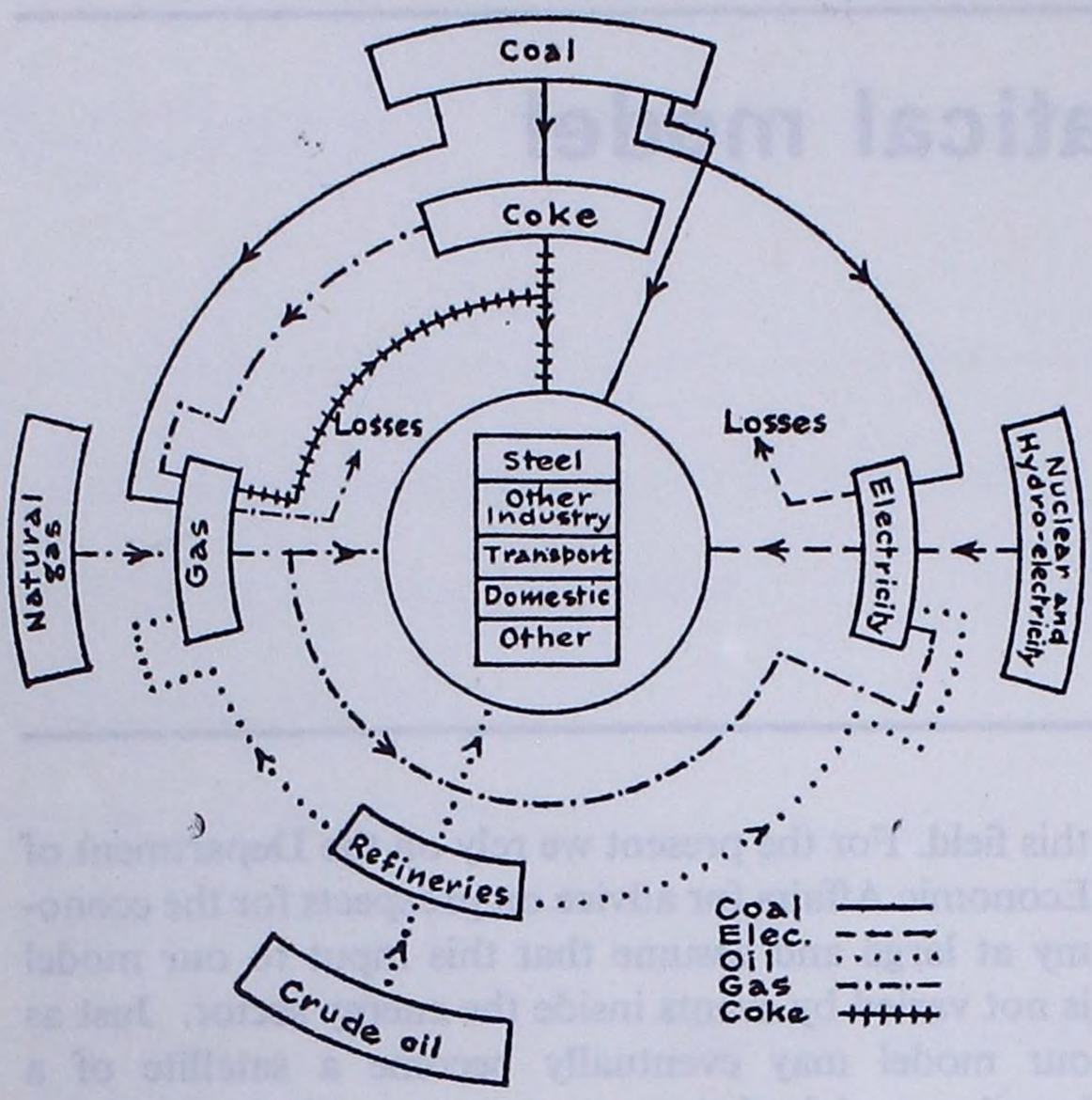
The primary purpose of our integrated model is to help in the sort of broad review of fuel policy which is represented by the 1967 White Paper.* For that review we carried out some fairly sophisticated economic analysis, designed to take into account all relevant factors of significance, both inside and outside the fuel sector, but the statistical methods available were rather crude. We badly needed a computerised model which could assess the effects of variations in policy and of variations in circumstances – which might be natural, economic or technological in nature, or might reflect changes in public taste or might stem from events occurring abroad over which we have no control – but no such model existed or could be constructed in time. We succeeded in adapting our relatively simple existing methods to get the answers we required for that particular exercise but, since fuel policy has to be kept under continuing review, it was decided to embark on the construction of an integrated model to cover the whole of the energy sector in both its supply and demand aspects.

The scope of the model is perforce limited to the energy sector of the economy. Eventually our model may become a satellite to a larger model of the economy generally and we keep in touch with those working in this field. For the present we rely on the Department of Economic Affairs for advice on prospects for the economy at large and assume that this input to our model is not varied by events inside the energy sector. Just as our model may eventually become a satellite of a broader model of the economy as a whole, so inside the energy sector there may be satellites of the principal model. These satellites will be constructed, either by the Ministry or by one of the fuel industries, whenever it is necessary to study a particular part of the field in greater detail than is done in the main model. The basic job of the main integrated model itself will be to calculate, year by year, on any particular set of assumptions, the demands for the various fuels, the use of resources (that is manpower, capital and running costs) and the resulting prices. This means that it will demonstrate the effect of varying one or more of the assumptions marginally or significantly, and show the cost of a marginal increase in production of a particular fuel. It will also provide a great deal of subsidiary information in addition to the standard output for which it is particularly designed.

General structure of the model

For the purposes of the model the supply side of the energy sector can be regarded as comprising four main industries – coal, petroleum, electricity and gas – which either individually or in combination take primary energy in the form of coal, oil, natural gas, nuclear fuel, hydro power, etc. and sell it to final consumers in the form of the fuel products that they require. The flow of fuels from their primary sources through the secondary processing industries to the final consumers is illustrated in the diagram. There the outer ring represents the primary fuels, the middle ring the conversion to products in the required form and the inner circle the final consumers. Costs can be regarded as building up in the same directions as fuel products move, whilst expenditures flow in the opposite directions.

**Fuel Policy*, Cmnd.3438, (HMSO) (Price 8s. 0d. net).



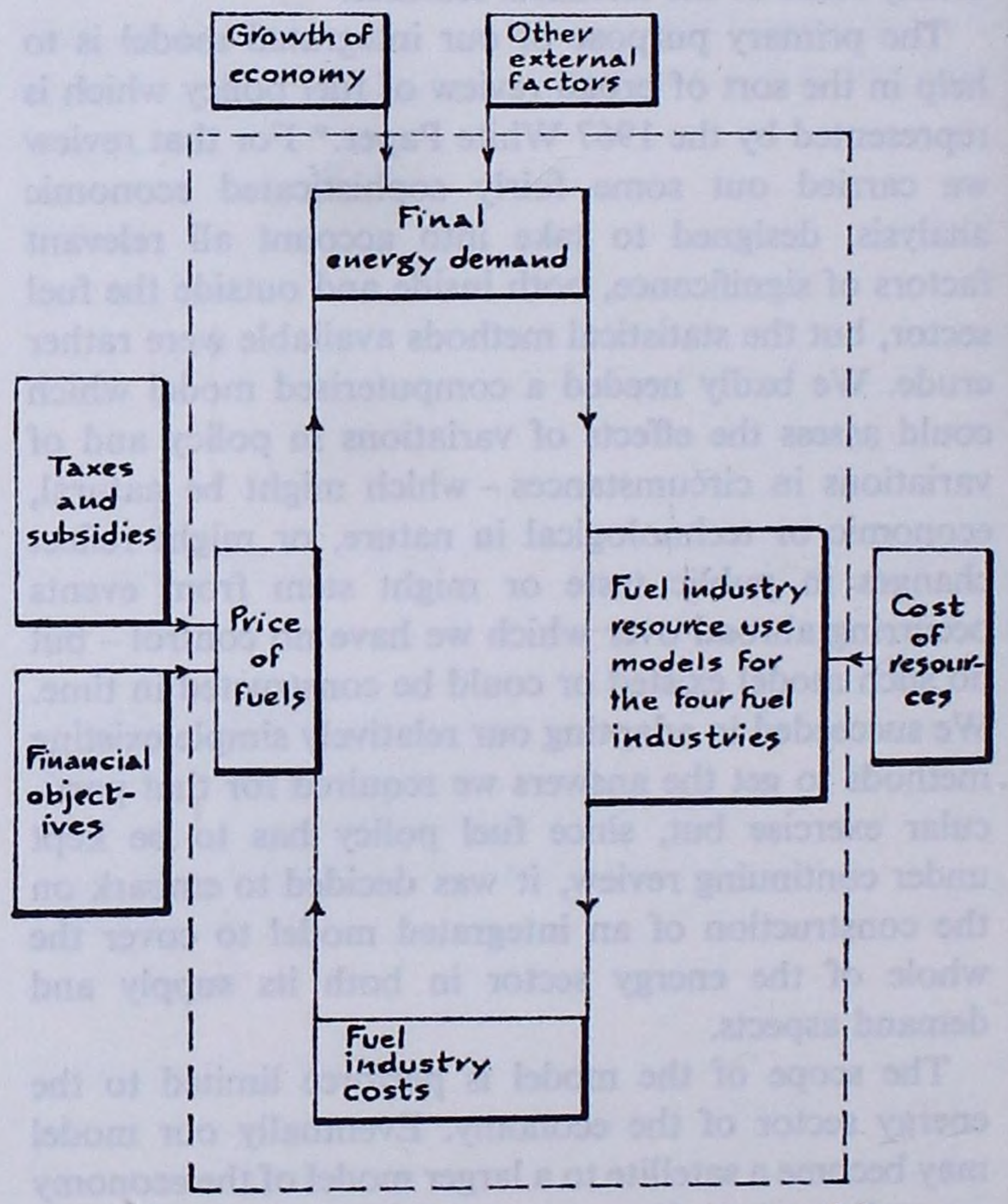
Structure of the energy sector

The integrated model of the energy economy is made up basically of 5 sub-models, that is a demand sub-model and 4 supply sub-models, one for each of the main fuel industries. The purpose of the demand sub-model, obviously enough, is to calculate the demand for each fuel. Demand depends partly on relationships outside the energy sector and partly on internal relationships. Such items as the growth of the economy and the scale of protection for indigenous fuels (taxes, subsidies and import controls) are provided to the demand sub-model from outside the main model altogether. The assumptions made can, of course, be varied at will if it is desired to test the effect of one assumption against another. The supply sub-models calculate the costs of meeting the demands, given by the demand sub-model, and the capital expenditure, manpower and so on which are required. To do this they are provided from outside the model with general information as to the prices of materials and the level of wage rates. The supply sub-models feed the resulting prices for their products back to the demand sub-model for a re-check on the demands. The electricity and gas sub-models also calculate the requirements of each primary fuel to meet the specified demand, and these are passed to the supply sub-model for the primary fuel concerned.

It will be seen that the operation of the integrated model is in the form of a loop, and this is illustrated below. The supply sub-models require information as to the demand from the demand sub-model, but the demand for the various fuels depends, in part, on their relative prices which are calculated in the supply sub-models and fed back to the demand sub-models. The final answers as to demand, costs, capital investment, manpower (which form the main output of the model) are, therefore, arrived at by a process of successive approximation.

Initially, at least, the model will concentrate on the medium and longer term up to at least 1980 and in broad terms perhaps further. Obviously the further ahead one looks the more uncertain is the picture, but such indicators as are available must be examined in case they materially affect the view as to what current policy will be best in the long run.

Our system has been to build the whole model in replaceable sections. In the first instance the model is on a national basis and the degree of detail used is being limited according to the data that can readily be made available. Any section will be able to be expanded as is found necessary in the light of experience, or to meet particular purposes. Thus if a particular relationship being incorporated in the model is open to argument, more than one relationship can be tried out to see whether the final answer is sensitive to the variation. To take a particular example, in the coal sub-model the prospective level of costs is likely to depend partly on how output per manshift (o.m.s.) develops. Differences of view among the experts as to the factors likely to be mainly responsible, and as to the possible effects of each factor, can be tested against each other. If the differences do not have a significant effect on the final answer, it may not be necessary to pursue the matter further. If they do, greater study will have to be given



Flow diagram of the energy sector model

to this particular aspect. When replacing any one section in this way it will, of course, be necessary to consider whether consequential amendments are required in other sections. In the example given manpower and wage costs per ton may be derived from o.m.s., but differences in o.m.s. may themselves be implied by greater or lesser degrees of automation involving variations in capital expenditure and in running costs other than wages. Lower wage costs per ton might, therefore, be accompanied by higher material costs and capital costs per ton.

Present position

The integrated model is now reaching its prototype stage. Most of the sub-models in their first prototype forms are being subjected to detailed scrutiny by experts in the particular sectors of the work – not necessarily experts in model construction – both in the industries and the Ministry. The staff of the industries concerned have done a lot of the work in the construction of the supply sub-models in particular and the first prototypes are, therefore, far more realistic than if this had been mainly an academic exercise. Even so we are a long way away from the time when the models can be relied on to produce an authoritative best estimate for any particular question. We have to examine all the innumerable estimates and assumptions which have gone into the component parts to see whether they are acceptable to the appropriate experts. Where differences exist and cannot easily be resolved it may be necessary to test the model on both assumptions in the way described a little earlier. Further development will certainly be necessary before we and the industries have real confidence in the results.

For all the nationalised industries fairly sophisticated production models are already completed. The fuel consumer is, however, interested in what the fuel actually costs him, including delivery charges, and the supply sub-model, therefore, needs to include a distribution element. In the case of gas and electricity, distribution is in any case part of the nationalised industry and capital expenditure, manpower requirements, etc., in respect of distribution are very much of direct concern to the Ministry. Petroleum is a case on its own because of its international nature as well as the fact that it is not nationalised. The petroleum sub-model is at present only in a rudimentary stage.

We deliberately left this until last because it is the one case where the level of U.K. demand may not have a great deal of effect on prices. For operating the model as a whole, before a fuller petroleum sub-model is constructed, we can assume that whatever oil is required will be made available at prices to be specified; alternative assumptions can be made as to these prices. We have judged it important to get the full model working quickly, even if, in some respects it is over-simplified, rather than to get the best possible representation in the first instance. Only in this way can we obtain experience in operating the various sub-models together and form a judgment as to what factors really have a significant effect on the final answers.

The model in detail

The demand sub-model

The demand sub-model draws price information from and feeds demand information to each of the four supply sub-models. It currently has a three part structure:

expanding any assumed growth in the whole economy into a comprehensive set of activity indicators such as consumers' expenditure, transport indices, outputs of individual industries, etc.;

deriving the total energy consumption in each market (such as domestic, iron and steel, road transport, etc.) from the corresponding activity indicator; and

deriving the shares that individual fuels secure of each market from their relative prices and other relevant factors.

The energy demand being covered here is, of course, that of the final consumers of energy and not that of the secondary fuel industries, such as gas and electricity, which is dealt with in the appropriate supply sub-model.

The first part of the demand sub-model does not really fall within the sphere of the Ministry of Power. It is more a matter for assessment by the central economic departments or for a model of the kind that Professor Stone has been developing at Cambridge. Close contact is, in fact, maintained with the Cambridge model project and particularly with some work being done there by Mr. K. E. Wigley on expanding the fuel and power aspects of that growth model. Where the central economic departments directly provide assumptions on the value of particular activity indicators we use them, and for the other we make use of fairly simple relationships.

The second part has been the subject of a good deal of previous study and we do not expect any particular difficulties. The Ministry's work on the energy demand sub-model has therefore been mostly concentrated on the third part, which assesses the shares that each fuel secures of the various markets.

The models which are under development to represent the market shares of each fuel in a given sector are of two types. The first makes estimates of future shares, starting from the present position, based on postulated changes in relative prices, incomes, time-trends, etc.

The second type does not itself make the basic estimates of future market shares. It starts from a given set of estimated market shares, which may be called

benchmark estimates, which correspond to a specified set of price trends. The benchmark estimates are arrived at separately from the model, for example, by the consensus of a number of alternative forecasting methods, applying informed judgement. The model restricts itself to providing a technique for modifying the given demands to correspond to other sets of future prices and possibly to variations in other factors.

We have found that the first form of market share model which we have developed has, in fact, already been widely and successfully used, particularly in America, by those engaged in the analysis of traffic flows, where the problem known as modal split is to analyse the way in which traffic on a route is shared between the different modes of transport. In the energy sector, there is the additional complication that a change in fuel normally requires first a change in appliance, and the effects of changes in the relative prices of different fuels may therefore be spread over a considerable number of years. We have, therefore, introduced time-lags into the analysis. We have derived models, incorporating appropriate time-lags, which fairly adequately account for the movements in fuel demands in a number of market sectors, but more work will need to be done in refinement.

The benchmark type of market share model has the merit that it can be used in conjunction with varied forecasting methods to provide a ready means of calculating the effect of changes in the assumptions. Also it should be possible to use it for practical work in advance of the validation of the other type.

The coal supply sub-model

The coal supply sub-model, and each of the other sub-models, is designed to show what would be the use and cost of resources in the particular industry in various alternative sets of circumstances. For coal we might have, for example,

a reduction in total output by 5%, 10%, etc., by the closure of older, less efficient collieries;
a fall in the manpower in the industry of 5%, 10%, etc.;
a rise in the wage-rates in the industry of 5%, 10%, etc.;
an increase in the effective running time of the coal-cutting and loading machinery of 5 minutes, 10 minutes, etc. in each shift;
the introduction of powered roof supports at 50 more faces, 100 more faces, etc.;
the building of a new washery at Colliery X;
the sinking of a new shaft at Colliery Y;
the amalgamation of Collieries A and B.

One of the most important decisions to be taken in the initial planning of a model is just how detailed to make that model, a major factor influencing the decision being the availability of the necessary basic data. In the case of the coal supply sub-model this factor led to the decision to make, in fact, two models.

The first was to be a simple model based on colliery data that was either immediately available or could be collected and analysed fairly quickly; the second a more detailed model for which a great deal of additional data would have to be collected colliery-by-colliery which was thought might take two years or more. The difference between the 'simple' and the 'detailed' models is that the simple model considers only the general or average changes that might take place throughout the industry as exemplified by the first few possibilities given above, while the detailed model would take into account possible changes at individual collieries as exemplified by the latter possibilities. At present the simple model is practically completed and work on the detailed model is now beginning.

For the simple model, we have been able to obtain from the N.C.B. a schedule of cumulative totals of output at ascending costs per therm for a recent base year (excluding those 'fixed' costs which are independent of changes in volume of output). From this relationship, and a knowledge of what the fixed costs are, can be obtained the cost/ton for different total outputs on the assumption that the output would be adjusted to the necessary level simply by cutting out production with the highest level of costs per therm. For the future, this is adjusted by taking into account the effect on colliery output and cost of various alternative and realistic possibilities of the kind given earlier, such as a productivity improvements from increased utilisation of machinery, etc.

This simple model is being split into regional models and into separate models for the main types of coal, but this does not involve any new point of principle.

In the detailed model each colliery or group of collieries would be considered not only as it is now but also in terms of its future potential measured by the changes in cost and output expected to result from various changes in the scale and methods of working the colliery. Such changes would alter the cost order of the collieries and the model would evaluate not only which collieries are needed to produce any given total national output but also just which changes at those collieries will enable this output to be obtained at least cost. The work has only just started and it is too early to prophesy its success or otherwise.

The gas supply sub-model

With the discovery of natural gas under the North Sea the gas industry is undergoing revolutionary change. In attempting to represent the way in which the industry will develop over the next 20 years to meet the demands forecast by the demand sub-model, the

principal factors which have to be considered are:

the rates at which consumers' appliances will be converted to burn natural gas;

expansion of the delivery capacity of the natural gas transmission grid;

the quantities of new gas making plant of various types that should be installed;

the building of liquefying and storage facilities and the manner of running the future system.

The Gas Council already have in regular use a computable model of the industry which considers these factors Area Board by Area Board. However, for the time being at least, it goes into too much detail and consumes too much computing time for it to be incorporated directly into our model.

Two alternative models have therefore been developed and are currently being validated. One uses the Gas Council model but treats the whole country as though it were one large Area Board. The other is a completely different approach using linear programming which is a technique for examining systematically a large number of alternative systems which would meet requirements, and choosing the one with least cost.

Each of the gas models discussed here evaluates the most economic course in choosing what plant to construct and operate for the manufacture and bulk transmission of gas, including the supply of natural gas. But these only account for part of the industry's total accounting costs, and estimates of the costs of distribution, services (showrooms, meter reading, accounts, etc.) and overheads have to be added. These estimates are made by relating the costs concerned to the gas industry's activity and adjusted in the light of expected future trends.

The electricity supply sub-model

The electricity industry may be regarded as having two more or less distinct functions. First the Central Electricity Generating Board converts primary fuels to electricity at power-stations and transmits it through the high-voltage grid. Secondly the Area Boards distribute and sell the electricity to consumers at lower voltages.

The economic planning problems on the generation and transmission side are those associated with the selection, timing and siting of large capital-intensive projects. Considerable choice is possible among the available primary fuels and there is scope for balancing the capital and running charges between different types of new investment.

The generation model has to represent for future years the new capacity required to meet the growth of peak demand, specifying the type of fuel to be used and the ways in which the system would operate when the new capacity was in operation – that is to say the extent to which each type of plant would be used, and the resulting fuel consumption. These would give the total capital and running costs associated with generation.

The computational technique being used is, like the corresponding model for gas, based on mathematical programming. This technique makes it fairly straightforward to incorporate such considerations as the special assistance being given to coal, alternative rates of oil tax, and practical or imposed limitations on the rate of installation of nuclear power stations. To complete the part of the model relating to the C.E.G.B., estimates are added of those capital and running costs which fall outside the generation model.

On the distribution side there are not the same elements of choice and we are not constructing a model of an optimising nature. Instead, for the present, we are using simple direct relationships between various items of distribution costs and the corresponding peak demands and units sold; for the future we are working on a more detailed approach which involves looking separately at the magnitude and cost of each of the major individual types of equipment which make up the distribution system.

The oil supply sub-model

This sub-model is not nearly at such an advanced stage of specification and development as are the other four sub-models. As we have indicated there are reasons why this could be conveniently left till last, but its construction also raises certain problems which are not shared by the supply sub-models for the other industries.

The oil industry in the U.K. refines and markets a wide range of petroleum products. It is carried on mainly by international privately owned companies competing with each other and it is a relatively small part of the world-wide operations of these companies. The picture is complex and so, at least in its early stages, an oil supply sub-model will inevitably be more generalised in its representation than the sub-models for the other industries.

Three alternative forms of oil industry supply sub-model are being considered for development, firstly relatively simple 'tap' models; secondly models representing U.K. operations in detail, with the rest of the world in broad terms; thirdly a detailed international model.

The tap model at its simplest would assume that the U.K. could obtain whatever oil was wanted by consumers and that the average price would not depend on the total quantity required, but would be determined outside the model (with alternatives, if necessary). A possible development of this approach would be to ascertain, by means of econometric research and technical knowledge the elasticities of supply (i.e. supply curves) for the various petroleum products.

The second type of sub-model which would represent

the U.K. picture in greater detail, might attempt to reflect the choices that the industry as a whole would make in given circumstances as regards demand and supply. The choices might include how much crude oil to import from various producing centres, how to refine this crude oil, how much additional refinery capacity should be built and what refined products should be imported and exported, and in making these choices certain constraints (such as maximum and minimum use of certain kinds of crude, and refinery balances) would need to be satisfied. This more detailed model might develop from the type of tap model described earlier or proceed by assuming that, in some defined way capable of mathematical calculation, the industry model would make the best choice from the point of view of the oil industry.

A fully international model of the oil industry would take into account the operations of individual oil companies, all the sources and markets for petroleum and would endeavour to represent all the flows and other interactions between them. This would be a very big undertaking. We have doubts whether it would be worth doing just to get answers for the U.K. – the object of the exercises – or even whether better answers would be obtained by this method than by less comprehensive methods, since the U.K. is a relatively small part of the world market.

The 'tap' type of model will be used at first. Further development will probably be concentrated on a model of the second type which combines an adequate degree of detail and accuracy of representation on the one hand with practicability on the other.

What the model will do

However sophisticated the methods used the model will remain essentially an additional tool for the policy maker. As at present designed, the integrated energy sector model is not capable of determining what policy is 'best'. In order to be so capable it would be necessary to have completely quantified all the various objectives of fuel policy and to include in the model all the variables relevant to these objectives. This is not at present practicable. The integrated model as a whole has been designed therefore as representational rather than optimising in character though, as indicated, some of the parts are of an optimising nature. It aims to produce a representation or statistical picture of what the future might look like under a number of assumptions and if certain actions were taken. The questions which would be put to it would not ask for the best policy or for a decision but would ask 'what would be the likely outcome of . . . ?' or 'how much difference would it make if . . . ?'.

The policy problems for which the model would be particularly useful would be of a global kind, requiring a broad but comprehensive view of the whole energy sector, and their solution would probably be its main application initially. It is not designed for use in examining the detailed individual decisions which are taken within a fuel industry, although it should prove of value in providing the necessary background material against which the individual decisions are examined.

Conclusion

There is little doubt that the construction of an integrated model of the type in view is perfectly possible. Models of a broadly similar nature have already been built for the economy as a whole, but it would not be unfair to regard these other models as still at an experimental stage. What we do not yet know is how realistic a representation the new model will be able to achieve, bearing in mind the great changes which take place in the fuel sector, so making flexibility an essential ingredient. The work of constructing the model will certainly improve understanding of many parts of the field – indeed it is already doing so – and parts of the model will enable certain aspects to be quantified much better than before. Whether the integrated model can be expected to replace completely other methods of forecasting in the foreseeable future is still undecided.

At this stage there are a vast number of component items on which there is scope for disagreement and uncertainty but we are reasonably confident that as the work progresses the area of uncertainty will steadily diminish to manageable proportions.

The model should become more and more useful as time passes, though for some time to come, measured in years rather than months, it will probably be used to supplement our older methods of forecasting rather than to replace them. We are particularly conscious that the outlook in the fuel sector can change rapidly and the model must be readily capable of reflecting such changes and, so far as possible, of foreseeing them.

Developments in input-output statistics

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Background

The United Kingdom was among the first of the countries to produce input-output tables and to use them for analytical purposes. They have been produced by private investigators, research institutions and by government departments. Detailed tables with 30 or more industries, have been published for the years 1935, 1948, 1954 and 1960 and the Central Statistical Office is now in the process of producing a set of detailed tables for the year 1963.

The first official table appeared in the first National Income Blue Book in 1952. This was a 'summary' table consisting of only eight industry groups. Somewhat larger summary tables have appeared in subsequent Blue Books. The first really detailed official input-output table, relating to 1954, was published early in 1961 in *Input-Output Tables for the United Kingdom, 1954*. This consisted of 46 industry groups. The first 'inverted' input-output table for the United Kingdom was published in the National Income Blue Book in 1955.

It should be noted that in order to produce a firmly based input-output table it is necessary to have a census of production, which provides detailed information about both sales and purchases for the manufacturing industries and for the mining and quarrying, construction and the gas, electricity and water industries. Such censuses have been taken in respect of the years 1948, 1954 and 1963. Detailed censuses have also been taken for the years 1951 and 1958, but these asked firms to provide detailed figures of their outputs and not of their inputs. When the census of production for 1958 was being planned in the mid-1950's an important consideration was to cut down the burden of form filling. At that time a considerable effort was being made to develop the quarterly national income accounts, and private industry and trade were being called upon to make new quarterly returns of their fixed capital expenditure, stockbuilding and trading profits. Industrial firms find it particularly difficult to provide detailed figures of their purchases of goods and services, and it was thought that it would be sufficient to ask for this kind of information in every other detailed census of production. Furthermore, there was no demand for detailed input-output tables for use within the government service or elsewhere. (In contrast, considerable use has always been made of the summary input-output tables pioneered by the Central Statistical Office.) Looking back now, I think it is unfortunate that firms were not asked to provide details of their purchases in the census for 1958.

Towards the end of 1962, Professor Stone and others of the Department of Applied Economics, Cambridge, published an up-dated table for the year 1960, consisting of thirty-one industry groups. (An up-dated input-output table is one which is not based on detailed information about industrial inputs for the year in question, but on projections from a firmly based table – in this case 1954 – for an earlier period.) This up-dated table provided the statistical basis for the input-output tables used in the National Plan.

The most up-to-date input-output tables relate to the year 1963 and consist of twenty-eight industry groups. They appeared in an article by Mr. D. C. Upton, Central Statistical Office, published in the August 1968 issue of *Economic Trends*.

The input-output tables for 1963

Plans for producing a detailed set of input-output tables for 1963 were laid down as soon as the tables for 1954 were completed in 1961. The design of the census of production for 1963 took account of the needs of input-output analysis. Firms were asked to provide details of their purchases of commodities (including fuel) and also of certain other business expenses, such as expenditure on repairs and maintenance, rates, market research and advertising. Questions about these business expenses were not included in the census of production for 1954. Unfortunately, the timetable for producing the input-output tables has been upset because processing the basic census of production results by the Board of Trade Census Office has been delayed by computer problems and programming difficulties. However, these have now been sorted out and the bulk of the census of production results will be available before the end of this year.

Because of these difficulties we have taken, as it were, several bites at producing the input-output tables. In the August 1966 issue of *Economic Trends*, we published a small input-output table for 1963 consisting of fifteen industry groups. This was based

Note.—This paper was presented to a conference on input-output held at Manchester University, October 30–November 1, 1968.

partly on the provisional summary results of the census of production and on other information relating to 1963, but for the most part it represented an up-dated version of the detailed table produced for 1954. Its purpose was to help bridge the gap between the taking of the census and the completion of the detailed input-output analysis. In the August 1968 issue of *Economic Trends*, this provisional analysis was carried further and a 'stretched' version of the up-dated table with twenty-eight industry groups was published. An important feature of this somewhat larger table is that it provides a disaggregation of the services industry group which until then had always appeared as a single row and column in the tables produced by the Central Statistical Office. In this new table Road transport, Rail transport, Other transport, Communications, Distribution and Other services are shown as separate industries.

Another new feature of the table is that an import matrix is superimposed on the inter-industry matrix. This import matrix provides a classification of imports by commodity group analysed according to consuming industries and final demand. The estimates are provisional until the results of the census of production are fully analysed and must, in any case, be very approximate. But despite this limitation they have been published in response to numerous requests.

The detailed input-output tables which are being compiled for 1963 consist of about seventy industry and commodity groups. A list of these is given at the end of this paper. The list is based on the Standard Industrial Classification, which is essentially a classification of statistical units by principal product or process. We hope that the classification will satisfy most users; but we recognise that it cannot satisfy them all. In particular, it will not meet the needs of those who are interested in a purpose, or functional, classification of activities, for example, those who are interested in sales and purchases of fuel, packaging materials, advertising, entertainment, durable goods, capital goods, and so on. These functional headings straddle a number of quite different industry groups. For example, packaging materials are produced, *inter alia*, by the paper, timber, glass, metal and plastics industry groups. Furthermore, within each of these industries, factories manufacturing packaging materials (e.g. paper bags and wrapping paper) also manufacture other products (e.g. toilet rolls). To attempt to meet the needs of all possible users of input-output tables, the industry classification adopted needs to be very fine; not so much because there might be an interest in each of the very large number of separate industries specified (these could number several hundred) but to permit the user to regroup the data to meet his own particular needs.

We propose to compile two basic input-output tables consisting of about seventy industry/commodity groups for the year 1963. The first of these is a matrix providing a classification by commodity group of the output of each industry group and of imports. This table will be similar to Table C of *Input-Output Tables 1954*. It will show for each commodity group how much is produced by the industry group for which they are principal products, how much is produced as secondary products by each of the other industries and how much is imported. The second basic table is the 'absorption matrix', which provides a classification by commodity group of each industry group's purchases. In this matrix no distinction will be made between whether the commodity purchased is home-produced or imported, or whether it is purchased from the industry producing it as a principal product or as a secondary product. This table will be similar to Table B of *Input-Output Tables 1954*.

In addition to these two basic tables, three other flow (or transactions) tables will be compiled. First, an import matrix providing a commodity classification of imports purchased by each industry group and by each component of final demand. To make this table more useful, it is proposed to divide the commodity classification of imports into more than 70 groups in order to distinguish the more important agricultural and mining products which do not have a counterpart in U.K. production or, which are for the most part, imported. Examples are imports of tobacco, raw cotton, raw wool and crude oil. The second and third matrices are the industry/industry and the commodity/commodity flow tables.

The industry/industry table is the traditional inter-industry transactions table, which sets out the pattern of sales and purchases of each of the different industry groups, and will follow the lines of tables previously published by the Central Statistical Office (e.g. Table A of *Input-Output Tables 1954*). This table can be used for assessing the relationship between the outputs and inputs of different industry groups, for calculating the primary input contents (e.g. the import content and the labour cost content) of the outputs of different industries and of various forms of final expenditure, for tracing the effects of price changes in one industry on other industries and for considering the manpower requirements of different industries, and so on. The commodity/commodity flow table is considered by many to be more suitable for projection work at a detailed level because it is said that the technical coefficients are more stable. Commodity matrices of this kind were used in compiling the National Plan.

In addition to these matrices of 70 industry and commodity groups, it is intended to produce a commodity classification by 70 groups of the inputs into each of the 119 separate manufacturing industries dis-

tinguished in the census of production for 1963. This rectangular matrix should be compiled fairly readily from the worksheets used in producing the 70 industry square matrix. However, expanding the 70 industry matrix into a larger one in which each of the separate industries distinguished in the census are shown separately – in other words into a square matrix of the order of 130 separate industry groups – is a problem of a different order of magnitude. Only limited resources are available for this kind of work in the Central Statistical Office and it is not certain whether constructing this very large table should be given priority over other input-output work discussed below.

In the 'stretched' 28 industry matrix published in the August 1968 issue of *Economic Trends* the services industries (other than Public administration, etc.) were divided into six separate categories. It is hoped to do the same thing again when the 70 industry table is compiled, but until the work is further advanced it is not yet certain whether it can be done. Although interest in the various services industries in the United Kingdom economy is steadily increasing, the information available about their purchases of goods and services and on the allocation of their sales is generally inadequate. Although very rough estimates of expenditure by the 28 broad industry groups on road, rail and other transport have been made, it is not certain whether existing information really justifies the extention of these estimates to cover as many as 70 industry groups. One difficulty is that in the census of production the valuation of goods sold is not uniform. The sales value is essentially the invoiced value – the amount charged to the customer – which can be either the delivered price, including transport paid by the manufacturer, or the ex-works price where the transport is paid for by the purchaser. In the case of exports the delivered price would be the f.o.b. value. From the point of view of each reporting establishment this is the most sensible treatment, but from the point of view of input-output analysis it is not. Another difficulty is that, in the census, firms are not asked to distinguish the amounts they pay for the different kinds of transport.

Work on compiling the detailed tables for 1963 is now going ahead rapidly, but a great deal remains to be done. At the end of September one-third of the census industry reports had still to be analysed, and when this is completed the important problem of balancing estimates of the total supply of each commodity group against the estimated total demand on the commodity group will have to be tackled. A major difficulty is that so little is known about distributive channels and margins, particularly on inter-industry transactions. If we find we are unsuccessful in matching total demand against supplies we will have to consider introducing an 'unallocated' column into the transaction tables, but we would prefer not to do so. Experience in compiling the 1954 tables suggests that this process of balancing could take two or three months of concentrated effort. If all goes well we expect to complete the detailed input-output tables by the middle of next year.

More up-to-date tables

The next detailed census of production will relate to the year 1968. In this census the number of separate census industries to be distinguished will be 154 compared with 128 for 1963, as some of the census industries are to be sub-divided. For example, metal furniture, metal holloware and manufactured stationery will be distinguished as separate census industries. Past experience suggests that detailed input-output tables based on the census are unlikely to become available before 1972. We recognise that a delay of four years between the year of the census and the year when the full results of the input-output work become available is too great for most purposes. To overcome this we intend to produce up-dated tables projected forward from the latest basic detailed table, which up to 1972 will relate to 1963. Once the detailed tables for 1963 have been compiled we propose to up-date them to the year 1966 or 1967. We hope that the up-dated tables will consist of something like 70 industry groups corresponding to the basic table for 1963. But it is not certain how much work this would involve, whether they would be sufficiently reliable and whether such detailed tables are really required. What may be done is to produce the information in two stages. First, an up-dated table consisting of something like 30 to 40 industry groups and, at a later stage, the more detailed tables with up to 70 industry groups. An important consideration here is how successful we will be in constructing a reasonably reliable 70 industry matrix for 1963 to provide the jumping-off point for the up-dated tables for subsequent years. A difficult problem to be faced is the reconciliation of the detailed figures of final expenditure given in the National Income Blue Book, which are based mainly on surveys of expenditure, with the detailed figures of final output, based on output data, which will emerge from the input-output exercise.

We propose to publish classification converters for each of the main items of final expenditure (e.g. consumers' expenditure, public authorities' current expenditure on goods and services, gross domestic fixed capital formation, etc.) which will show the relation between the functional classifications of final expenditure given in the national income accounts and the commodity classifications used in the input-output tables.

The gradual introduction of a new system of production statistics following the census of production

for 1968 will greatly facilitate the calculation of up-dated tables. A description of the proposed scheme was given in an article by Mr. J. Stafford (Director of Statistics, Board of Trade) in the first issue of *Statistical News*. The intention is that the new Business Statistics Office, which will be developed out of the existing Board of Trade Census Office, will collect detailed information on sales by manufacturing industries on a quarterly basis. This will be supplemented by annual inquiries which will collect information on total sales and purchases, changes in stocks and work in progress, wages and salaries and certain other data necessary to compile census net output and gross output. The quarterly inquiries will produce up-to-date figures of sales by different industry groups which, when combined with the annual information, will provide the kind of information which is now only obtained in a full and detailed census of production. Under the proposed new arrangements the detailed results will become available very much more quickly than hitherto. In addition to this regular information, it is intended to collect from industry, at periodic intervals (perhaps once every 3 or 4 years) detailed information about goods and services purchased. For the years in which this information is collected, it will be possible to produce firmly based detailed input-output tables, which in turn will provide the benchmarks from which more up-to-date tables can be derived.

Further work on input-output analysis

Input-output analysis is potentially a very powerful tool and, if it is to be exploited to the full, a considerable amount of research and analysis needs to be done. Among the first things to look at are the technical coefficients to see whether they have changed between 1954 and 1963, the two years for which we will have firmly based tables.

Comparing the technical coefficients (or the input-output relationships) in 1963 with those in 1954 can be done broadly speaking in two different ways. First, what may be called the superficial approach could be adopted. Using this approach, the 1963 input-output flow table would be reduced in size and made as far as possible comparable to the table for 1954. (It will be remembered that the 1954 table comprises 46 industry groups whereas the 1963 table will consist of about 70 industry groups.) This procedure is not as simple as it may look at first sight. The first problem is to convert the two tables to the same price basis, which means that each cell will have to be revalued by the price index appropriate for the transaction. A major snag with this calculation is that the errors involved may be large in relation to the changes in technical coefficients which the analysis is seeking to measure. There are other problems. For example, the 1954 tables were based on the old 1948 Standard Industrial Classification, whereas the 1963 tables will be based on the 1958 Classification. A further difficulty is that sales of merchanted goods were largely excluded from the census of production for 1954, whereas in the 1958 and 1963 censuses they are specifically included and shown separately. In the 1963 input-output analysis these distributive activities are being treated systematically as secondary output, whereas in the 1954 tables they were not. Furthermore, in order to get the tables out as quickly as possible, the input-output analysis for 1954 concentrated on the flows between the industries covered by the census of production leaving the services industries to be shown as one large aggregate. This meant that the estimates of purchases and sales by the Services industry group were obtained in many cases as residuals. In compiling the 1963 tables a more thorough analysis of the services industries has been carried out and, even though the results obtained so far are provisional, it is becoming clear that some of the estimates of inputs into the services industries shown for 1954 may be too high. Another difficulty is that since the tables for 1954 were compiled, the estimates of national income and expenditure to which they are related have been revised, which means that the published tables for 1954 need to be adjusted before valid comparisons can be made with 1963. There is also the very important human element to be considered. The people compiling the 1963 tables are not the same as those who constructed the 1954 tables. Inevitably, different assumptions and estimates will have been made in the two exercises.

It should be clear from this that any comparison of the two tables using this superficial method will certainly be subject to doubt. Also, it is arguable whether any useful conclusions about changes in technical coefficients can be drawn from considering input-ouput tables with as few as 40 or so industry groups. For many purposes these industry groups are rather wide and apparent changes in technical coefficients may reflect shifts in the product mix within the industry groups. A further point is that 1954 and 1963 are two isolated years on different points in the business cycle. It is statistically unsatisfactory to attempt to derive a trend from two observations.

The alternative approach is to carry out a detailed systematic analysis of changes in technical coefficients by analysing the original material which is being published in the 1963 census of production industry reports. These give an analysis of materials and fuel purchased by establishments employing twenty-five or more persons in 1963 with comparable figures for 1954. However, a detailed and comprehensive comparison of the input-output coefficients in the two years would mean virtually reconstructing the 1954 input-output matrix from scratch. Maybe this is what should be

done; I do not know. But it would certainly use up a large amount of resources. If the comparison were to be carried out by research workers outside the Central Statistical Office who did not have access to the work-sheets used in compiling the 1963 tables, it is quite likely that they would make different assumptions and take different decisions and they could very well end up with different results. Any detailed work on comparing the 1954 and 1963 data needs to be done in consultation with the Central Statistical Office. It is clear that to make useful comparisons of the input-output relationships in 1963 and 1954 will require a major effort.

It might be useful to carry out an intensive study of a limited number of industries from the published material given in the census of production. In this case it is for consideration whether the analysis of purchases of goods and services should be valued at purchaser's prices and not at seller's prices, which is the usual and most useful way of recording transactions in input-output tables. If we are concerned only with the purchases of an industry in two different periods, I think it would be more appropriate to consider the actual prices paid rather than the prices at which the goods and services were sold.

Another approach would be to make a cross-section study of the variations in technical coefficients by size of establishment within a number of selected industries. This analysis might throw some light on the rate of technical progress and efficiency in the various industries. To carry out such an analysis, detailed tabulations of inputs for establishments grouped by size would need to be made available from the census. Another line of approach would be to make comparisons of individual establishments making returns in both the 1963 and 1954 censuses. Naturally, much of the work would have to be done within the Board of Trade Census Office in order to avoid disclosing the activities of particular firms.

I have the impression that in macro-economic work and in building micro-economic models of the national economy, input-output tables of much less than 70 industry groups are required. For these purposes input-output tables of the order of 30 or 40 industry groups are considered adequate. But in view of the developments in other countries, in particular in the United States, careful consideration needs to be given to the construction and to the use of very large matrices consisting perhaps of three or four hundred industry groups. This is the kind of detail which many large firms seem to require for their management and market research purposes. If this is the case, the information made available for each census industry would need to be expanded. We would need to have details of inputs and outputs for the various sub-divisions of each census industry. Such information would permit the user to consider and investigate rather narrowly defined industries and also groups of industries which straddle across the Standard Industrial Classification.

Careful consideration needs to be given to the problem of up-dating, a subject which has been touched upon already. Some people believe that annual input-output tables should be prepared by up-dating the benchmark data for a previous year. But if they are interested in measuring changes in technical coefficients, there would seem to be little purpose in providing annual up-dated tables with say 30 industries. On the other hand, an annual up-dating of a more detailed table of the order of 70 industries would require relatively large resources and pose considerable data problems.

The signs are that the business world is becoming interested in input-output analysis. This interest will almost certainly increase as more and more people become familiar with the technique and with its possibilities. There are also signs that research workers at the universities and research institutions are wishing to carry out more input-output studies. In order to avoid the possible duplication of research on input-output, the Central Statistical Office has undertaken the responsibility for co-ordinating this work.

Classification of industry and commodity groups for the input-output tables for 1963

Industry or commodity group	*Standard Industrial Classification 1958 Minimum List Heading*
1. Agriculture	001
2. Forestry and fishing	002, 003
3. Coal mining	101
4. Other mining and quarrying	102, 103, 109
5. Grain milling	211
6. Other cereal foodstuffs	212, 213, 219
7. Sugar	216
8. Cocoa, chocolate and sugar confectionery	217
9. Other food	214, 215, 218, 229
10. Drink	231, 239
11. Tobacco	240
12. Mineral oil refining	262
13. Paint and printing ink	274
14. Coke ovens	261
15. Pharmaceutical and toilet preparations	272
16. Soap, oils and fats	275
17. Synthetic resin and plastics materials	276
18. Other chemicals and allied industries	263, 271, 273, 277
19. Iron and steel	311 to 313
20. Light metals	321
21. Other non-ferrous metals	322
22. Agricultural machinery	331
23. Machine tools	332
24. Engineers' small tools	333
25. Industrial engines	334
26. Textile machinery	335
27. Contractors' plant and mechanical handling equipment	336, 337
28. Office machinery	338

Industry or commodity group	*Standard Industrial Classification 1958 Minimum List Heading*
29. Other non-electrical machinery	339
30. Industrial plant and steel work	341
31. Other mechanical engineering (including machinery repair)	342, 349
32. Scientific instruments, etc.	351, 352
33. Electrical machinery	361
34. Insulated wires and cables	362
35. Radio and telecommunications	363, 364
36. Other electrical goods	365, 369
37, Cans and metal boxes	395
38. Other metal goods	391, 392, 393, 394, 396, 399
39. Shipbuilding and marine engineering	370
40. Motor vehicles (including tractors)	381
41. Aircraft	383
42. Other vehicles	382, 384, 385, 389
43. Production of man-made fibres	411
44. Cotton, etc. spinning and weaving	412, 413
45. Wool	414
46. Hosiery and lace	417, 418
47. Textile finishing	423
48. Other textiles	415, 416, 419, 421, 422, 429
49. Leather, leather goods and fur	431 to 433
50. Clothing	441 to 446, 449
51. Footwear	450
52. Cement	464
53. Other building materials, etc.	461, 469
54. Pottery and glass	462, 463
55. Furniture, etc.	472, 473
56. Timber, and miscellaneous wood manufactures	471, 474, 475, 479
57. Paper and board	481
58. Paper products	482, 483
59. Printing and publishing	486, 489
60. Rubber	491
61. Other manufacturing (including plastics moulding, etc.)	492 to 496, 499
62. Construction	500
63. Gas	601
64. Electricity	602
65. Water	603
66. Railways	701
67. Road transport	702, 703
68. Other transport	704, 705, 706, 709
69. Communication	707
70. Distributive trades	801, 802, 831, 832
71. Miscellaneous services, including insurance, banking and finance	871, parts of 872 and 874 873, 875, 879, 881 to 889 and parts of 891, 899 and 860
72. Public administration and defence and public health and educational services	901, 906 and parts of 872 and 874
73. Domestic services to households,	891 part
Private non-profit-making organisations serving households	899 part
74. Ownership of dwellings	860 part

Civil aviation statistics

B. F. Middleton *Chief Statistician, Board of Trade*

The need for statistics

The Government, as the United Kingdom civil aviation authority, needs information about the civil aviation industry so that it may understand the structure and problems of the industry, how it is developing and the part the Government should play in this development. The Government also has executive responsibility for some activities within the industry. It owns some airports – at one time the major international airports, now vested in the British Airports Authority, were government-owned – and is directly responsible for their management; the expansion of existing airports and the development of new airports under other ownership impinge on government planning responsibilities; the Government assists the financing of development at airports owned by municipal authorities and other owners; the Government provides the air traffic control services at British Airports Authority aerodromes and many others in the country; and the Government negotiates with other countries for traffic rights that permit United Kingdom airlines to operate international services. For all these purposes the Government needs quantitative information for the formulation of its policies and the discharge of its responsibilities.

Outside Government and the air transport industry itself, both airlines and airports, a number of other authorities and organisations have a keen interest in information about civil aviation. The Air Transport Licensing Board (A.T.L.B.), in particular, needs to be fully informed of all appropriate circumstances when issuing licences and fixing tariffs. There are also many businesses and organisations which need, in the course of their affairs, information of various kinds about the state of development of civil aviation. These include aircraft manufacturers, shippers and other actual or potential customers for passenger and cargo services, and all other concerns engaged in activities ancillary to civil aviation. The public too have a right to be kept informed on matters of economic and social importance, the more so in the case of civil aviation where they have a large financial stake in British aircraft, airlines and airports.

The statistics collected

There are two major sources from which the Government derives statistics about civil aviation activity:

The statutory licence returns made each month by United Kingdom airlines

These returns include details of the operations mounted under each of the licences issued to airlines by the A.T.L.B. They show the number of flights made, the total mileage flown, the type of aircraft used and the traffic carried.

Voluntary airport returns

The airports supply to the Board of Trade details for each air transport flight originating or terminating at the airport. Details of time of movement, the type of movement, the operator, the type of aircraft, the traffic carried, the next (last) stop and the ultimate destination (origin).

A considerable volume of material is collected by this means. For many years this material has been processed on punch card machines that are flexible enough to permit the material to be arranged and analysed in a variety of ways. The processing is now being transferred to a computer.

Additional information (e.g. revenue, costs and profit for route groups and aircraft types) is provided to the Government by the Air Corporations and by the British Airports Authority and some of it is published in their annual reports. The audited accounts of these public corporations are published and companies operating private airlines are required, by the Companies Acts, to deposit financial information with the Companies Registry. The Companies Act, 1967, extended the range of Companies required to deposit information and the scope of that information.

Some statistics which include activities of British airlines and airports are collected and some are published by other organisations. Important sources of statistics are the International Civil Aviation Organisation and the European Civil Aviation Conference. These official organisations normally publish the statistics they obtain. Private associations, like the International Air Transport Association and the European Aeronautical Research Bureau, collect statistics from their members and circulate aggregates to them for their own use. Some global totals, for instance North Atlantic passenger traffic and total European air transport activity are generally released. This article, however, is concerned mainly with the official British civil aviation statistics.

Publication

It is the general policy of the Board of Trade to publish the economic statistics that it compiles as fully as possible within the constraints imposed by questions of national interest, and commercial confidentiality. Better decisions will be made by Government and businesses if they are made with knowledge of all the relevant facts. The publication of statistics about an industry, by documenting the performance of the industry and by giving a yardstick by which individual managements can compare their own performance, can assist the search for efficiency, especially, perhaps, in industries with some of the features of monopoly or where there are constraints on competition.

The civil aviation statistics published by the Government fall into three main groups:

Activity at airports

Information is given monthly in three publications in the Civil Aviation series of *Business Monitor* with data for about 45 airports in the United Kingdom and Channel Islands.

C.A.1. *Airport Activity* records aircraft movements and analyses them by category of flight within the main classification of commercial and non-commercial movements. The most important flight category is air transport and there are separate figures for scheduled services and charter flights which are further sub-divided into flights by United Kingdom operators (Corporations and others) and overseas operators. Details of air transport movements diverted to United Kingdom airports are also included.

C.A.2 *Air Passengers* analyses figures for air passengers according to whether they were starting or finishing their journeys at the reporting airport or in transit through it. A breakdown of passengers carried on scheduled services and charter flights by United Kingdom operators (Corporations and others) and overseas operators is also given.

C.A.3. *Air Freight and Mail* analyses freight by direction of flow and whether carried on scheduled services or chartered flights by U.K. operators (Corporation and others) or overseas operators.

Activity of United Kingdom airlines

Two further publications in the *Business Monitor* Civil Aviation series give details of the activity of U.K. airlines.

C.A.4. *Airlines* (monthly) gives a number of indicators of the activity of the three sectors of the industry – B.O.A.C., B.E.A. and the independent operators including aircraft miles flown; passengers, freight and mail carried; capacity offered and taken up.

C.A.5. *Airlines* (quarterly) presents information about operations for each airline under each of the types of licence granted by the Air Transport Licensing Board. Details of fleet utilization are also given by aircraft type and operator.

Passenger origin and destination

Quarterly figures of passengers travelling by air between the United Kingdom and abroad, both in total and for a selected list of countries, are published in the *Monthly Digest of Statistics*. The selection is designed to limit the size of the table and only countries for which the numbers are substantial are shown; figures for other countries can be obtained from the Board of Trade on request.

Further developments

The Board of Trade are consulting with all British airlines about the possibilities of extending the published civil aviation statistics and have sought their views on some specific suggestions about the publication of traffic statistics, the provision of financial information and of information about the operating costs of aircraft. As a result of this exchange of views some specific proposals for extensions to the published statistics are being considered.

Invisible earnings and payments

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It is commonplace that a surplus on Britain's 'visible' trading account with the rest of the world (exports and imports of goods) has hitherto been unusual, but that a surplus could be counted on in the balance of 'invisible' transactions with the rest of the world. Yet the size and composition of this surplus has been less certain. The balance on the invisibles account is the net result of a wide range of international transactions, few of which can be measured by relatively straightforward processes like traders' declarations to Customs of their exports and imports of goods. The three main categories are sales and purchases of services (referred to as 'exports' and 'imports' of services), receipts and payments of investment income, and transfers (legacies, gifts, etc.). The variety of services exported and imported is considerable, including travel and tourism, shipping, civil aviation, financial services, royalties and licence fees, construction work, government expenditure overseas, and many others. The total of earnings and payments, now approaching £7,000 million in a year, is well over half the corresponding total for visible trade. Since the estimates of many components of the total of 'invisible' earnings and payments have to be based on the transactors' financial accounts, and often require special efforts to distinguish domestic from overseas transactions, the estimates for invisibles are bound to take longer to appear than the visible trade figures, to appear less frequently, and to be subject to error particularly when they are first produced. By the same token more accurate and detailed figures are likely to confer considerable benefits in the shape of improved understanding of the nation's external economic relationships and problems.

History of the figures

In the early post-war years there was an apparatus of detailed control of payments to foreign countries, and of certain receipts, from which statistics on invisible transactions could be derived. Even so the administrative processes of the control were much less concerned, in authorising payments, with distinguishing between the various types of transaction (which might have been necessary if quotas had been applied) than in establishing that a payment was being made as part of a normal commercial transaction. Knowledge about the precise purpose of payments was therefore limited, and was even less complete in the case of receipts. Soon relaxations were applied to small payments, and authority was delegated to commercial banks.

It is worth noting at this point a general difficulty about statistics of international transactions derived from information on receipts and payments reported through banks: to find out the commercial purpose of a payment the bank may need to approach its customer and even then knowledge of the precise nature of the underlying transaction may be lacking in a firm, at the point where payment is made or proceeds are banked. And information on individual banking payments required purely for statistical purposes raises the difficulty (more acute in Britain than in other countries) that it is necessary to identify for the statistics all remittances to or from non-residents – and these are not merely the payments at present subject to exchange control, but also payments to sterling area countries and all receipts, in each case involving transfers directly to or from abroad and transfers to or from bank accounts held in this country by non-residents. For these reasons it became clear in the late 1950's that the measurement of Britain's invisible transactions (together with long-term capital flows) would need to proceed largely by direct enquiry or survey of the transactors. This would enable the information to be tapped at the point where income and expenditure accounts were compiled and would limit, though not avoid completely, the difficulty of distinguishing between transactions with non-residents and those with residents.

Surveys of this kind were not completely lacking. At the Government's request the Chamber of Shipping had launched before the war a series of surveys into its members' overseas earnings, and a further full-scale census was conducted for 1952. Additional surveys were launched progressively and their results incorporated into the published estimates of total invisible earnings and payments. The main ones were the responsibility of the Board of Trade, covering income from direct investment (from 1958), receipts and expenditure for overseas travel and tourism (from 1962), civil aviation transactions (from 1963) and royalties, licence fees, etc. (from 1964). Other information enabled separate figures to be published on income from overseas portfolio investment (from 1958) and on the detailed composition of earnings and payments in

respect of miscellaneous services (from 1964). Many of the results were published in the *Board of Trade Journal*, and they were brought together in the annual 'Pink Book' on the balance of payments. When a survey had initially covered complete accounting years (e.g. income from direct investment), it was often later supplemented by a smaller scale sample survey relating to calendar quarters, and the results published as part of the quarterly series of figures on the balance of payments. In other areas, however, quarterly surveys were lacking and indirect methods of estimation continued to be used.

Recent developments

In 1967 there were two reviews of the state of information on invisible transactions. First, an inter-departmental review of the timeliness and accuracy of the whole range of balance of payments statistics concluded that further efforts should be made to fill in gaps in the quarterly estimates of invisibles, to widen the coverage of some existing surveys and to consider launching some new ones where indirect methods of estimation had proved inadequate. Secondly, an independent review by a Committee of people distinguished in the world of commerce, set up by the British National Export Council, reported[1] on ways of promoting further increases in invisible earnings but also documented the whole field very thoroughly and in doing so inspired a number of new enquiries into the earnings of various City institutions which had been previously covered by indirect methods of estimation. The report included many recommendations on statistics, particularly about improvements in the measurement of the overseas earnings of City institutions. In the light of these two reviews, government departments and the Bank of England have drawn up a programme of action, and this has been presented to the Committee on Invisible Exports (now established permanently with official participation in succession to last year's Committee). Some additional information has already been published[2] and more is planned. In the following paragraphs the recent and forthcoming developments are listed in the order of the standard headings in the balance of payments statistics, followed by a section on alternative methods of classification and other related topics.

Work in hand

Government expenditure and transfers

This is well documented as part of the normal processes of control of public expenditure. Some monthly data are now being obtained which later may enable provisional quarterly estimates to be produced rather earlier than at present.

Private services – shipping

The Chamber of Shipping's periodic censuses and sample annual enquiries are the main source of annual estimates, covering earnings of UK-operated ships and providing a basis for estimates of freight payments for imports carried in foreign operated ships. The coverage of the Chamber's sample annual enquiry has recently been extended, particularly for tanker transactions.

Quarterly estimates have hitherto been indirectly based. The Chamber is now examining the possibility of obtaining quarterly information from a sample of companies on the earnings of dry cargo vessels, though for speed and simplicity this may not include all types of revenue and expenditure and would probably relate to revenue and expenditure on completed voyages. In conjunction with information on tonnage of cargo imported and exported analysed according to flag of carrying vessel, it would provide improved quarterly estimates of the freight earned by UK vessels from the carriage of UK exports and imports, and (by residual) on cross voyages.

A good deal of quarterly information on expenditure in respect of tankers is already being provided by the oil companies. On the earnings side, at present annual estimates are separately provided, as part of the Chamber of Shipping's enquiries, but the earnings form part of the known total proceeds of selling oil abroad. An improved allocation of oil companies' revenue between freight and other components is being separately examined.

Private services – civil aviation

The estimates are based on quarterly returns by the air corporations, returns (at present mainly annual) by the principal foreign airlines and independent UK airlines, the Board of Trade's international passenger survey and a variety of traffic statistics. The coverage of the estimates for the independent UK airlines has recently been improved, leading to an upward revision of the total earnings of UK airlines. In general the quarterly estimates are as firmly based as the annual.

Shipping and civil aviation – passenger revenue

Separate estimates were published in the 1968 Pink Book of receipts of UK operators from visitors to the UK and of payments to foreign operators by residents making visits abroad – in each case part of a wider total published previously. This will display that part of the transport concerns' revenue which is associated with these visits, which can be set alongside the figures in the travel account – relating to expenditure by tourists and other travellers within the country visited (including internal fares).

Private services – travel

The quarterly and annual travel estimates are based very largely on the results of the Board of Trade's International Passenger Survey, a sample survey of passengers passing through the ports which obtains information on the numbers and expenditure of overseas visitors to the UK and of UK residents making visits abroad. (Information on migration is also obtained.) The coverage of air and sea routes to and from the UK is virtually complete except for the routes between the UK and the Irish Republic, for which estimates provided by the Irish Central Statistics Office are used.

Provisional estimates of credits and debits for the latest quarter have for some time been made on the basis of partial information, and as they have proved reasonably reliable have been published separately as from the second quarter of 1968.

Other private services

Most recent and projected developments are in this category, which shows a large surplus and covers a wide range of transactions totalling about 30 per cent of turnover on all private services, and over 15 per cent of turnover on the invisibles account as a whole. An itemised table of annual figures was first introduced in 1966 and the following sections deal with the main subheadings.

Financial and allied services

The credit entry represents the earnings from the export of services (as distinct from profits of overseas branches or subsidiaries or other income from overseas assets) which are traditionally regarded as being centred on the City of London. The 1968 Pink Book has introduced a further breakdown into the three main components (insurance, banking and merchanting) together with a single figure for the remainder, covering the earnings (mainly from brokerage) of the Stock Exchange, the Baltic Exchange and various other institutions. The *insurance* figures in this category relate mainly to Lloyd's underwriters and brokers, and are based on a quarterly enquiry conducted by the Board of Trade. A fair degree of estimation is however involved in assessing the quarterly contribution of Lloyd's underwriters to current earnings (as opposed to financial balances). The *banking* figures make use of the results of a survey on 1965 earnings conducted by the first Committee on Invisible Exports, together with other information available to the Bank of England. The Bank will conduct further surveys, probably at three-yearly intervals, the first relating to the year 1969. The *merchanting* figures cover the profits on 'third-country' trade (that is, international trade other than UK exports and imports) of the commodity markets and export houses; these are derived from information available to the Bank of England, supplemented when possible with the results of the first Committee's surveys. Improved methods of regularly measuring these earnings are being planned in consultation with the institutions concerned. A new quarterly survey is now in operation on the *brokerage* earnings of the Stock Exchange. In the case of the Baltic Exchange, information is at present partial, but a periodic survey is planned starting from 1969.

The first Committee on Invisible Exports pointed out that the existing system of classification did not permit total figures to be brought together of all the receipts of the financial institutions. To give further detail of earnings from financial services would still exclude other income, such as the profits derived from overseas branches and subsidiaries, which are treated as investment income, together with income from portfolio assets overseas. This year's Pink Book on the balance of payments[2] introduces an Annex giving these total figures for the various groups of financial institutions. This also shows separate figures for the total overseas earnings of various insurance institutions – the British Insurance Association (mainly classified as investment income in the standard tables), Lloyd's underwriters and insurance brokers.

Royalties, licence fees, etc. and headquarters services

Annual information based on a survey by the Board of Trade is now published in the *Board of Trade Journal* and brought together in the balance of payments Pink Book. Quarterly figures are at present projected (with the aid of some information on payments derived from exchange control) but separate figures are not published.

Miscellaneous services

Some components, e.g. *construction work overseas*, *advertising*, *films and television earnings*, are based partly or wholly on regular surveys. It is planned to widen the ambit of these surveys. The first Committee on Invisible Exports obtained information by direct enquiry on various types of *professional earnings*; it is proposed to continue and develop periodic surveys in this area.

The present base of the estimates of *commissions earned* by UK selling agents on imports is outdated and it is planned to bring the estimates up to date. More precise estimates of commissions payable by exporters to their foreign agents is being sought as part of a general investigation into the basis of valuing exports.

A fine degree of analysis has been made of a sample of payments recorded through exchange control with a view to identifying areas in which more precise information should be sought on the corresponding earnings. The 'rag bag' of *miscellaneous earnings* is at

present very roughly assessed in relation to the corresponding payments. As progress is made in improving the basis of the estimates for the more important components, it will become possible to devote more attention to refining estimates of the remaining miscellaneous earnings.

Investment income

Direct investment

The statistics of earnings on direct investment (due to the UK and due abroad) are being developed along two lines. First, efforts are being made to speed up the processing of the Board of Trade's full-scale annual surveys, and to improve methods of predicting final results from the early returns. Secondly, the coverage of the Board of Trade's quarterly sample has been widened; but information here will always be partial (viz. dividends and the cash element of capital flows) since quarterly profit and loss data are frequently lacking.

Portfolio investment

The estimates of credits are firmly based on Inland Revenue data, though the method of assessing the overseas income of financial institutions leaves some room for doubt as to the extent to which these institutions' income from overseas portfolio assets is identified. At present an estimate is made for the likely deficiency. The estimates of debits are based on two separate approaches; information from exchange control or from 'partner' countries; and estimates of the income payable on the stock of liabilities in the form of overseas holdings of British government stocks, local authority securities and companies' securities. As the information from the second source becomes more nearly complete it is compared with that from the first source and discrepancies are investigated.

Oil earnings

The present estimates, merged in the published statistics with miscellaneous investment income, are the residual obtained by adjusting the known cash outcome of all external transactions by UK oil companies for items included elsewhere in the balance of payments accounts, i.e. for imports and exports of oil (valued at f.o.b. posted prices *less* standard discounts), for other imports and exports of goods, for freight earned by the oil companies' tankers (valued at an average rate for charters compiled by a panel of London brokers), and for inward and outward oil investment. The estimates thus broadly represent the overseas component of the oil companies' total profits, together with the earnings of their UK headquarters or subsidiaries from services provided to overseas subsidiaries or affiliates. They are, however, subject to residual error and, particularly over short periods, tend to be affected by timing differences between the record of cash receipts or payments and the accrual of revenue and costs; being residual estimates they are affected by revisions to the items included elsewhere in the balance of payments accounts.

Possible improvements to limit the scope for error are now being considered, with particular reference to the allocation of transactions to the various categories of the balance of payments. Some time, however, is likely to elapse before any actual changes in method come about.

Miscellaneous investment income

Estimates of income on official and banking assets and liabilities are based on their known value and on information available on the rates of interest earned or paid on the various classes. Interest on outstanding suppliers' trade credit is similarly estimated, but there is some uncertainty about the extent to which interest is compounded in export valuations, so that improvements can be expected from the investigation mentioned above into the basis of valuing exports. Income on non-commercial real estate owned abroad and on miscellaneous overseas assets presents difficult problems of measurement, but is kept consistent with the capital stock implied by the cumulative estimates of net purchases which have been included in the capital account of the balance of payments.

Systems of classification

The existing classification of current account transactions depends primarily on a distinction between goods, services, investment income and transfers. The classification of services in long-standing international use is mainly 'functional' in character; e.g. all services in connection with the transport function are brought together. There have recently been two sets of proposals for further refinements or alternatives to this system of classification.

Revised U.N. System of National Accounts

The United Nations Statistical Commission gave general approval this year to a revision to international concepts and definitions for national accounts statistics. The repercussions upon the International Monetary Fund's recommendations for balance of payments concepts are still under consideration. It is possible that the existing classifications within the services category will be supplemented, but not altered, for purposes of the international system of national accounts; the main changes for this system would involve a more rigorous classification by economic sector, which would mean, for instance, segregating as household expenditure certain components now classified to the government account (personal expenditure by armed forces and

diplomats), to the shipping account (crews' expenditure) and to the travel account (tourists' expenditure as opposed to expenditure on business travel). Other possible changes for the national accounts system affect the boundaries between goods and services (transferring oil bunkers from transport services to goods), between services and investment income (transferring royalties and licence fees from services to a widened category entitled 'property and entrepreneurial income'), and the ambit of investment income (the proposed exclusion in international standards for national accounts statistics of the undistributed profits of overseas subsidiaries).

Report on Britain's Invisible Earnings

This report [1] suggested that the existing classifications within the goods, services and investment income categories should be supplemented by what might be called an 'industrial' classification applied to total current account debits and credits. This proposal has a similar tendency to those being considered for the international system of national accounts, but in practice it is most important in respect of the activities of financial and allied institutions, where credits and debits appropriate to the 'goods' category are small but others tend to be split between two sub-headings of services and two sub-headings of investment income. A start has been made in the Annex mentioned above to this year's Pink Book, bringing together totals of the credits and (where appropriate) the debits for banking, insurance, merchanting and brokerage activities. Further extensions are possible, e.g. construction work overseas. In other cases the 'industries' are amorphous, e.g. 'tourism', and activities continue to be allocated to the primary organisers of services (e.g. transport services) with an additional split between those connected with tourism and the rest, as described above.

Other developments

Sources and methods

The sources of the statistics and methods of estimation are described in the Notes and Definitions section of the annual Pink Book on the balance of payments. Rather more detail has just been published in the International Transactions chapter of *National Accounts Statistics: Sources and Methods* [3].

Reliability gradings

Rough reliability gradings for invisible transactions, introduced in *National Accounts Statistics: Sources and Methods*, will be reproduced and kept under review in the annual Pink Books starting with the 1968 Pink Book published this September.

Seasonally adjusted estimates

Seasonally adjusted figures for all main components of debits and credits in the invisibles account were introduced with an explanatory article in the January 1968 issue of *Economic Trends*, and now appear regularly as part of the quarterly article on the balance of payments. This has enabled more attention to be devoted in commentary to the gross figures of credits and debits (previously only published on an unadjusted basis). The adjustments are reviewed each year after figures are prepared for the annual Pink Book and the results are incorporated in the September issue of *Economic Trends*.

Estimates at constant prices

Estimates of goods and services exported and imported, revalued at constant prices and seasonally adjusted, are included in the quarterly articles on national income and expenditure. These estimates are described in *National Accounts Statistics: Sources and Methods*. They have hitherto been based on 1958, but are now being re-based on 1963. Consideration is being given to publishing separate estimates of exports and imports of services at constant prices.

Analytical work and forecasts

The developments mentioned above in the basic statistics for the UK and in the derived estimates are aimed to improve the foundation of economic forecasts. Work on assembling world aggregates of invisible transactions (in the standard classification) is also under way (International Monetary Fund and Committee on Invisible Exports). Similar aggregates for the overseas sterling area countries are regularly published in the September issue of *Economic Trends*. The econometric relationships at present used in forecasting invisibles are of a relatively simple kind, being based on data for which the time series is frequently short and being necessarily confined to relationships with those determining variables which can be forecast with some measure of confidence. As work on formulating relationships progresses, it should become possible to publish some of the results.

References

(1) *Britain's Invisible Earnings*, British National Export Council, October 1967 (Price 45s. 0d. net).

(2) *United Kingdom Balance of Payments 1968* (the Pink Book), (HMSO), September 1968 (Price 12s. 6d. net).
This contains notes on the estimates, and references to more detailed descriptions in the *Board of Trade Journal* and elsewhere.

(3) *National Accounts Statistics: Sources and Methods*, prepared by the CSO, (HMSO), September 1968 (Price 45s. 0d. net).

Standard industrial classification, 1968

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United Kingdom

The Standard Industrial Classification was first issued in 1948 with the aim of presenting industrial statistics produced by different government departments on a consistent basis. This classification was later revised by an inter-departmental committee in the light of experience in use, and as a result of changes in the organisation of industry, and a new edition was published in 1958. A few amendments were incorporated in 1963, but major revisions cause difficulty in maintaining the continuity of historical series, and ten years seemed a reasonable period for an edition to be in use before changes in the structure of industry made another complete revision desirable. The 1968 Standard Industrial Classification is the result of this second revision.

The revision was carried out by an inter-departmental committee, under the chairmanship of the Central Statistical Office, which held about 50 meetings. In considering the need for changes in the classification the Committee took account of the information available from the Censuses of Production and Distribution, and from short-term enquiries, about the size and rate of growth of various activities and the ways in which they were typically combined in establishments. In a number of cases further information and advice on these points was obtained from trade associations. The Committee also received many suggestions for changes in the classification from trade associations, from individual firms and from some of the Economic Development Committees. All these suggestions were carefully considered and some were adopted, but a number of them were clearly motivated by a hope of avoiding liability to Selective Employment Tax rather than by purely statistical considerations.

The 1968 Classification will be brought into use as soon as possible; for most statistics this will be some time in 1969. It will be used for the detailed Census of Production for 1968, which will be taken in 1969, and for the index of production when it is re-based during 1969 on the year 1963. It will probably be adopted for the industrial analysis of employees, the unemployed, and vacancies from mid-1969 and for wage rates, the monthly index of average earnings and the earnings and hours enquiries from the beginning of 1970. Industrial statistics in the 1969 issue of *National Income and Expenditure* will be on the revised basis. It will also be used in the Census of Population, 1971.

Form of the classification

The general form of the classification remains unchanged. As before, it is based on industries, not occupations, and without regard to who owns or operates them. The unit is again taken to be the 'establishment'. The definition of an establishment in the 1958 edition was found in practice not to be sufficiently clear, and has been considerably expanded. In particular, there had been some doubt about the treatment of ancillary activities, and the classification of central offices at separate locations from the establishments they serve, and these points have been clarified in the 1968 definition. It was decided that if departments carrying on ancillary activities for a firm could supply separate information on those activities such as that required for an economic census, they should be classified according to their own activity, and not the major activity of their firm. In order to facilitate the provision of industrial statistics at a local level, a new concept of 'local unit' has been introduced. Where one business is carried on at a number of addresses, separate data on some subjects may be available for each address, although it cannot be regarded as a separate establishment. It is then identified as a local unit, for which statistics can be separately provided for certain purposes.

Some difficulty has been found in the classification of different types of installation work by specialists, and a note giving guidance on this subject has been added to those on merchanting activities and repair work in the Introduction.

Various changes have been made in the Orders and Minimum List Headings of the Classification; the number of Orders has been increased from 24 to 27, and the number of Headings from 152 to 181. As far as possible the 1958 M.L.H. numbers have been left unchanged, but some changes have been necessary to accommodate the new Headings. The increase in the number of Orders is the result of

separating products of coal and petroleum from the chemical industries;

dividing the very large engineering Order into three – Mechanical, Instrument, and Electrical Engineering.

Additional detail

Although a number of extra Minimum List Headings have been added for industries that have increased in importance in recent years, it was only in the chemical and allied industries that a major re-arrangement of Headings was needed. In particular, MLH 271 – Chemicals and dyes – has been split up, separate Headings being raised for dyestuffs and pigments, and for fertilizers, while pharmaceutical chemicals have been included in a Heading with pharmaceutical preparations. In the Order for Insurance, banking and finance, each sub-division has been made a Minimum List Heading, and the Order has been enlarged to include business services and the central offices of firms operating abroad or with mixed activities, all of which were previously included in the Order 'Miscellaneous services'. The creation of separate Minimum List Headings for insurance, banking and finance will facilitate the use of the classification in financial statistics. Other examples of the introduction of new Headings because of increasing importance are: a Heading for petroleum and natural gas in the Mining and Quarrying Order; the replacement of the Heading for scientific, surgical and photographic instruments etc. by three separate Headings, and of the Heading for radio and other electronic apparatus by four separate Headings, and a separate Heading for pumps, valves and compressors, in the Engineering Orders. The sub-division for research and development services in the Heading 'Other professional and scientific services' has increased in importance, partly because the change in treatment of ancillary activities (see above) means some research departments attached to establishments in other industries are classified here. It has therefore been made a separate Heading in the Order 'Professional and Scientific Services'. Many of the other new Minimum List Headings had also been shown as sub-divisions in the previous classification and used in some statistical enquiries though not in others.

Some Minimum List Headings have been added in sectors where, although it has been recognised as desirable to collect separate statistics, the practical difficulties (e.g. of overlapping activities) have previously prevented this being done. It was considered, in spite of these difficulties, that the attempt should be made for certain industries, of which the following are examples:

Wheeled tractor manufacturing, which had been included with motor vehicle manufacturing. The difficulty here is to separate the manufacture of parts and accessories for these two types of vehicle.

In the Paper, printing and publishing Order; manufactured stationery; printing, publishing of newspapers; and printing, publishing of periodicals. One difficulty here was to find a clear dividing line between newspapers and periodicals.

Wholesale distribution of food and drink, and of petroleum products, and retail distribution of food and drink. Previously, all wholesale distribution was in one Heading and all retail distribution in another.

The very large industry represented by the Heading 'Catering, hotels, etc.', has been split into five Headings – hotels, restaurants, public houses, clubs and catering contractors.

Transfers

A few activities have been transferred from one Order to another to which they seemed more appropriate. Examples of these are vegetable and animal oils and fats from Chemicals to Food, drink and tobacco; engineers' small tools and gauges from Engineering to Metal Goods not elsewhere specified; powered industrial trucks and industrial tractors from Vehicles to Mechanical engineering; and the additions to the Insurance, Banking and Finance Order already mentioned above. Much consideration was given to the classification of certain activities on the borderline between manufacturing and service industries, but very few changes from the 1958 Classification were eventually made. The most important were the transfers of milk processing, coffee blending, grinding and roasting, and tea blending from Distribution to Food, drink, and tobacco. The classification of these activities is now in line with that in the International Standard Industrial Classification.

International

The International Standard Industrial Classification (ISIC) which is published by the United Nations, was also being revised concurrently with the revision of the United Kingdom classification. The committee concerned with the latter also put forward suggestions and comments on the revision of the ISIC and members of the committee participated in the international discussions on the subject. The draft of the revised ISIC was submitted to the 15th Session of the United Nations Statistical Commission in March 1968 and was accepted with minor modifications. The 1968 revision was subsequently published in June 1968.

The ISIC is designed to promote international comparability in the reporting of data relating to manpower, production, capital formation, etc. Since it has to be suitable for use by countries throughout the world, it is essentially a compromise between the many different national classifications. On the one hand, it has to provide for the separate classification of activities which are important in the world economy but which may be non-existent or negligible in some countries;

on the other, it cannot go into as much detail as the classifications of some of the highly industrialized countries, since very few countries would be able to report in this detail and even those which could do so differ in their industrial structure. To facilitate the provision of data in summary form and to meet the needs of countries whose own classifications are not yet in much detail, the revised ISIC provides for classification at four levels. First, there are 10 'major divisions', each identified by a single digit (the digit 'O' is used for the category 'Activities not adequately defined' so that for most purposes only 9 major divisions will actually be used). The major divisions are divided into 33 'divisions' denoted by the addition of a second digit and these in turn are divided into 72 'major groups' (three digits) and 159 'groups' (four digits). Broadly, the Divisions of the ISIC correspond to the Orders of the United Kingdom classification and the Groups to Miminum List Headings.

The main changes in the structure of the ISIC introduced in the 1968 revision were an increase of about one-third in the number of groups and the introduction of four levels of classification instead of three. The former 1-digit level 'Divisions' were re-named 'Major Divisions' and the additional level was the new 2-digit 'Divisions'. One consideration in introducing this additional level was that it could be used in classifying data relating to companies or enterprises, whose activities frequently cover more than one group and which it would therefore be difficult to classify in more detail. The increase in the number of groups was due to the introduction of a more detailed breakdown in certain manufacturing industries – mainly in chemicals and allied products. engineering and metal goods and miscellaneous manufactures – and in business and personal services.

Apart from the sub-division of various groups mentioned above the revised ISIC incorporates a number of transfers of activities from one group to another resulting from suggestions made by various countries. Most of these changes are relatively small. One of the most important is in the treatment of repair work. The previous ISIC classified all establishments specialising in repair work in the same groups as the corresponding manufacturing establishments. In the present revision establishments mainly engaged in the repair of consumer goods (footwear, radios and television sets, watches and clocks, motor vehicles and cycles, etc.) are excluded from manufacturing and classified in services.

Reclassifying UK data in terms of ISIC

The ISIC and the United Kingdom classification are very similar in concept and structure and the changes made in the course of the recent revisions have brought them closer together than their predecessors. It will therefore be possible to present statistics classified according to the UK classification in terms of the ISIC without any serious differences in coverage. At the most detailed level many of the ISIC groups are identical with Minimum List Headings. In other cases the ISIC group can usually be obtained by adding two or more Minimum List Headings together. There are, however, a few points at which it is difficult to bring the two classifications together. The change in the ISIC treatment of repairs to consumer goods, mentioned above, follows the UK practice as far as manufacturing industries are concerned, but ISIC now provides five separate groups for these repairs within the division for personal services. The UK classification only provides a separate Heading for one of these – footwear repairs – the others being combined with the corresponding distributive activity. Again, the ISIC has a separate group for 'Sanitary and similar services' which combines refuse and sewage disposal with chimney sweeping, window and office cleaning, etc. None of these services are separately distinguished in the United Kingdom, some of them being part of local authority services and others being in miscellaneous services. These, however, are small points which will not have any serious effect on international comparisons of figures classified according to the ISIC.

References

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

International Standard Industrial Classification of all Economic Activities, Statistical Papers, Series M, No. 4, Rev. 2 (United Nations).

Notes on current developments

POPULATION AND VITAL STATISTICS

1961 Census of Population

The *Census 1961, Great Britain, General Report* is divided into three parts.

Part I Administrative Report includes the history and developments of taking Censuses as well as the organisation, enumeration, and the processing and publications for 1961.

Part II Statistical Assessment covers such aspects as the post-enumeration survey, the ten per cent sample (and consequent sampling errors), quality of response and the quality of the data. Also included is a chapter on comparisons between the 1951 and 1961 Censuses.

Part III Scotland deals in summary form with particular points relevant only to Scotland.

Reference

Census 1961, Great Britain, General Report, (HMSO), August 1968 (Price £2 2s. 6d.).

1966 Sample Census of Population

England and Wales

The *Migration Tables* for England and Wales are to be published in two main volumes and nine regional volumes. The *Migration Summary Tables, Part I* gives statistics of the numbers and characteristics of people who changed their usual residence in the year or in the five years before Census day with details of their sex, age, marital condition. *Migration Regional Reports* contain a limited amount of information about England and Wales, the standard regions and conurbations of England and Wales. More detailed information is given about the local authority areas in each region with 15,000 or more resident population. Each volume gives the number of migrants classified by sex, age, marital condition, occupation, socio-economic group, industry and the area within a region to which migrants moved and the areas elsewhere in the country from which the migrants to each particular region came. The inclusion of figures under any particular heading, however, is dependent upon such a figure exceeding a certain minimum level.

The publication dates and prices for the regional reports are as follows:

North Western	August 1968	(£2 0s. 0d.)
East Anglia	September 1968	(£1 0s. 0d.)
Wales	September 1968	(£1 7s. 6d.)
Yorkshire and Humberside	September 1968	(£1 10s. 0d.)
West Midlands	September 1968	(£1 12s. 6d.)
Northern	October 1968	(£1 12s. 6d.)
South Western	October 1968	(£1 12s. 6d.)
East Midland, South Eastern	Not known at present	

Scotland

The *Workplace and Transport Tables* and *Migration Tables, Part* 1 for Scotland have been published. Certain tables in these volumes were curtailed by the omission of areas with fewer than a stated number of movements. More complete unpublished versions are available.

Unpublished versions of tables published for Great Britain or regions of Great Britain in the *Economic Activity* volumes are also available for Scotland or sub-regions of Scotland.

The *Housing Tables, Household Composition Tables* and the *Economic Activity* leaflets are scheduled for publication before the end of the year.

A synopsis of the census publication programme and specifications of unpublished tables may be obtained for the cost of reproduction from General Register Office, Census Branch, Station Road, Corstorphine, Edinburgh 12.

Reports not yet published

Migration Summary Tables Part II
Economic Activity Tables Part III and IV
Household Composition Tables
Usual Residence and Birthplace Tables
Housing Tables
Parliamentary Constituency Tables
Commonwealth Immigrant Tables
Education Tables
Report on Special Study Areas (Scotland)
Commentaries

References

Sample Census 1966, England and Wales, Migration Summary Tables, Part I, (HMSO), December 1968 (Price £2 10s. 0d. net).

Sample Census 1966, Scotland, Migration Tables Part 1, (HMSO, Edinburgh), August 1968 (Price £2 19s. 0d. net).

Planning the 1971 Census of Population

A description of the first of the preliminary large-scale Census tests, carried out in April 1968, will appear in the next issue of *Statistical News*.

Mortality

The Appendix Tables in the *Registrar General's Quarterly Return for England and Wales*, No. 478 contains Abridged Life Tables, loss of expected years of life, deaths by sex and age distinguishing 36 causes (amended to 8th Revision (1965) of the International Classification of Diseases) and the number of abortions certified under the provisions of the Abortion Act 1967.

Reference

Registrar General's Quarterly Return for England and Wales, No. 478, (HMSO), September 1968 (Price 3s. 6d. net).

SOCIAL CONDITIONS

Conference on social indicators

The publication of regular statistical indicators that would provide a measure of primary social trends, analogous to the now well-established system of main economic indicators, is a subject currently being studied at the Central Statistical Office. Work of this nature has already been put in hand or is being actively considered in a number of other countries, including the United States and France; and the Social Science Research Council, which views this as a potentially valuable focus for academic social research in this country, recently took the initiative in arranging a small week-end conference to discuss the problems involved, to which officials from the C.S.O. and both the United States and France were invited. This took place at the Centre for Environmental Studies, Regent's Park, on 29 and 30 June 1968.

The French team was unfortunately unable to attend at the very last moment, but it subsequently proved possible for the American representatives to go to Paris for a mutually useful discussion. In the event the participants were:

Mr. M. Olson, Jr. and Dr. Pamela Haddy Kacser (Office of the Secretary to the U.S. Department of Health, Education and Welfare), Professor J. S. Coleman (Department of Social Relations, Johns Hopkins University), Professor C. A. Moser, Mr. T. S. Pilling, Mrs. M. Nissel and Mrs. S. Linden (Central Statistical Office), Mr. J. L. Nicholson (Ministry of Social Security), Professor M.M. Webber (Centre for Environmental Studies), Mr. A. A. Shonfield (Royal Institute of International Affairs), Dr. M. Young and Mr. D. E. Allen (Social Science Research Council).

Mr. Olson provided an opening paper for discussion, in which he outlined the background to the American work and the ways in which the various problems had been confronted. Afterwards Professor Moser described the rather different method of approach being attempted by the C.S.O. The remainder of the conference was given over to a detailed assessment of the validity and practicability of various possible statistical treatments, special attention being devoted to the degree of aggregation permissible.

A fuller account of the conference will appear in the November issue of the Social Science Research Council's *Newsletter*.

HEALTH

Nutrition of young children

A Pilot Survey of the Nutrition of Young Children in 1963 has been published by the Ministry of Health (Reports on Public Health and Medical Subjects No. 118, H.M.S.O. 6s. 9d.). The survey was carried out mainly to gain methodological experience – in the kind of response to be expected, in fieldwork techniques, in the problems of detailed diet recording – for national nutrition surveys then being planned, but some nutritional findings of interest are included.

The report describes how diet records were obtained for a week's consumption by some 430 children between the ages of nine months and five years, and the method used for converting food intakes to nutrient values. Problems raised by surveys of this kind and techniques learned are discussed. For example, the relationship of height and weight to nutrient intake proved of sufficient interest to warrant special consideration being given to ways of obtaining accurate measurements in the home. Following successful trials, in the survey, of apparatus to measure lying height, portable equipment for measurement in the home of lying height and weight of young children has been devised. A method of cumulative weighing of prepared foods (first the empty plate, then the plate with the first item of food on it and so on with the addition of each item) proved successful in practice; original procedures which had proved too complicated for mothers and coders were simplified. The national survey of the nutrition of preschool children is using both the newly devised measuring equipment and the procedure for cumulative weighing of prepared foods.

Study of health screening

A Ministry of Health study in the field of health screening for the early detection of disease is to be published shortly. Carried out by the Ministry's Social Science Research Unit, the study is a social and economic assessment of a Multiple Health Screening Clinic organised in 1966 by the Corporation, and Medical Officer of Health, of the County Borough of Rotherham.

The study began with a random survey of local people to ask whether they knew about the screening clinic

and approved of it, and whether they would attend. The random enquiry also obtained information about the health history of respondents, their work, the composition of their households, age, sex, social class, and place of birth which gave an indication of the current distributions of social and economic factors and of health characteristics over the range of possible attenders. It thus provided a control group against which the characteristics of actual attenders, obtained from a subsequent clinic survey, could be compared.

The clinic survey was carried out by randomly sampling arrivals at the clinic centre during sessions. Questions were similar to those of the field survey but also covered reasons for attending and ease of attendance. Time studies were made of attenders' progress through the tests and of time spent in queues. A review of the distribution of staff in clinic sessions was made and a stratified sample of staff was interviewed to assess the total effort contributed to the clinic by professional and other staff in relation to normal duties.

It was concluded that users of the 1966 Screening Clinic in Rotherham, who were self-selected, were not typical of the population of Rotherham in the following respects:

approximately one-third did not live in the Borough;
there were twice as many women as men;
they included slightly more, of both sexes, around middle age;
they tended to consult their G.P. less – and not to prefer screening by their G.P.;
they were more concerned with, or worried about, their health – but were better informed on health matters; they were more convinced of the value of screening;
they were of slightly higher social class rating.

A significant proportion of clinic attenders (one-fifth of the sample) were attending because some symptom was worrying them. So far as these symptoms are concerned, therefore, the clinic was serving the purpose of normal consultation rather than early detection. Choice of tests, or reasons for attending, were not significantly influenced by previous treatment by G.P. or at hospital – or by notions as to which diseases might be curable.

No reliable evidence is as yet available of the extent to which an increase in clinic facilities might be matched by a higher demand or response rate. Pressure on clinic facilities progressively increased throughout the study and was still heavy on the last day, suggesting the existence of a significant unmet demand. Against this, however, field interviews showed that the proportion of the random population who were potential clients was very nearly the same as the proportion who actually attended – suggesting that demand might shortly have been met.

Economic effects attributable to the output of the Rotherham Clinic in 1966 are as yet proportionately very small. A comprehensive screening system however, under which, if it were possible, everyone took all the screening tests for which he or she were eligible, would consume resources equivalent to a major portion of the Local Health Authority budget currently available. The cost of following up screened cases (treatment and process after referral) is likely to be a significant multiple of corresponding screening costs – whether of actual or potential clinic output.

Reference

Social Science Research Unit (Ministry of Health) Report No. 2, *The Multiple Health Screening Clinic, Rotherham 1966: A Social and Economic Assessment.*

Disease coding by computer

An article by R. W. Howell, A.M.R. (Authority Health and Safety Branch, UK Atomic Energy Authority) and Ruth M. Loy (World Health Organisation Centre, General Register Office) on Disease Coding by Computer using the 'Fruit Machine' method describes a system of computer coding in which each different word encountered in many thousands of diagnoses is stored with all the code numbers with which it has been associated, the number common to all words in the diagnosis submitted being normally the correct code number.

Reference

British Journal of Preventive and Social Medicine, Vol. 22, No. 3, British Medical Association, July 1968 (Price 18s. 6d. net).

HOUSING

New information on housing

A new constant standards cost index for traditionally built one or two storey local authority houses has been devised by the quantity surveyors of the Ministry of Housing and Local Government in co-operation with the Ministry's statistics branch. The index aims at isolating changes in costs in housebuilding work by applying appropriate weights to changes in unit prices of some 23 commonly occurring items, each representative of a particular trade or operational section of a typical traditional house. A description of the new index and some of the results obtained since the first pilot enquiry in 1964 are published for the first time in *Housing Statistics*, No. 10.

The average cost of local authority dwellings in England and Wales, including ancillary buildings, fees, site works and land acquisition has been estimated for the years 1963 to 1967 and figures are published in *Housing Statistics*, No. 10.

Some results of the house condition surveys in the West Midlands and South East Lancashire conurbations, conducted during the autumn of 1967, are also

included in *Housing Statistics*, No. 10. The tables show the estimated stock of dwellings in December 1967 by condition, tenure, age, lack of amenities and repair costs. Other tables will be given in later issues.

Other supplementary tables in *Housing Statistics*, No. 10 bring up to date information which has appeared in previous issues on the private enterprise housing enquiry, local authority dwellings completed by region and by type of authority, dwellings started, under construction and completed annually by regions and conurbations, the proportion of houses and flats in local authority and private sector completions, and the local authority housing revenue account. The issue also includes information on overspill schemes and on rent tribunal action, some of which has previously appeared in the Ministry's annual *Handbook of Statistics*. A section has been included to bring together miscellaneous statistical information given in Parliamentary answers or prepared for other official purposes and not published elsewhere.

Local Housing Statistics, No. 7 includes for the first time a table showing loans for house purchase by each local authority during the financial year 1967/68.

References

Housing Statistics, Great Britain (Quarterly), No. 10, (HMSO), October 1968 (Price 8s. 6d. net).

Local Housing Statistics, England and Wales (Quarterly), No. 7, (HMSO), October 1968 (Price 12s. 0d. net).

Housing and local government statistics

The *Handbook of Statistics 1967* is the third in an annual Ministry of Housing and Local Government series first published in 1965. Its purpose is to make available statistics relating to the exercise of the Ministry's statutory functions in the different fields of activity for which it is responsible.

The opportunity has been taken this year to include in the Handbook a number of new tables on matters not previously dealt with and to revise and in some cases expand those tables which have appeared in previous issues. Tables published for the first time include the following:

The number of local authorities, by type of authority and size of population

Alterations to local authority areas during the year ended 1 April 1967, showing the effect on acreage and on population

Smoke control orders confirmed under the Clean Air Act 1956

Local authority loan sanctions

Rate support and specific revenue grants

Rate rebates

Valuation lists: proposals and appeals

Building regulations: relaxations, appeals and determinations

Grants for repair and upkeep of historic buildings and ancient monuments

The table showing schemes for the reception of overspill population, previously confined to London overspill, has been expanded to show all agreed town development schemes in England.

Reference

Handbook of Statistics 1967, (Annual), (HMSO), October 1968 (Price 8s. 6d. net).

EDUCATION

Scottish education

Scottish Educational Statistics 1967 (August 1968) is the second edition of the annual volume of statistics produced by the Scottish Education Department.

This edition is broadly on the same lines as the first but the sections on primary and secondary education, further education, and training of teachers and teachers in service have been expanded. For instance there is a new table summarising data about pupils and teachers at different types of schools and giving the ratio of pupils to teachers in the various types of education authority and grant-aided schools at January 1967.

Also introduced for the first time are tables which give details of the numbers of new entrants to vocational further education courses and of the numbers of overseas students in attendance at establishments for further education. At October 1967 new entrants accounted for 91,321 of the total roll of 148,047. There were 460 overseas students attending various types of full-time course, of whom 291 were new entrants.

The estimates of school population have been revised in the light of the decrease in live births (partly due to migration) and the postponement of the raising of the school-leaving age until 1972/73. The school population is not now likely to reach 1 million before 1973.

During the session 1966/67 the average class sizes as taught in education authority primary and secondary schools were 32·9 and 19·0 respectively. In grant-aided schools the corresponding figures were 29·5 and 17·1. The trend for pupils to stay on after the statutory leaving age continues: at education authority schools 43·9 per cent of the 15-year-olds remained at school in 1967 compared with 31·6 per cent in 1963, an increase which is also reflected in the figures for the older age groups. Closely linked with the trend to stay on at school is the increase in the numbers of pupils obtaining qualifications in the Scottish Certificate of Education examination. Although the total numbers obtaining 5 'O' grades, or 1, 2 or 3 'H' grades have not yet reached those of the post-war 'bulge' years of 1965 and 1966, the numbers who left school in 1967 with 4 'H' grades or 5 'H' grades and better are greater than ever before.

The tables devoted to further education statistics show that the numbers of students in full-time, and day and block release vocational courses have continued to increase and that the estimated enrolments for 1967/68 are expected to exceed those of the previous session by 2,250 and 3,500 respectively. The figures of entries and successes in certain examinations reflect the growth in popularity of the courses offered for City and Guilds of London Institute and Scottish Council for Commercial, Administrative and Professional Education awards. Successes in City and Guilds examinations have increased from 9,626 in 1963/64 to 15,874 in 1966/67 while the corresponding figures for S.C.C.A.P.E. examinations are 14,332 and 21,114.

The numbers of students attending part-time non-vocational courses offered by university extra-mural departments and courses under the auspices of the Workers' Educational Association are shown this year, in addition to those at further education centres and central institutions. A very substantial increase in the numbers enrolling has brought the total in part-time non-vocational courses to 185,000.

A considerable increase in the number of students starting courses at the colleges of education in session 1967/68 is shown – 5,260 compared with 4,604 in 1966/67. Of the students who started training in this session, 1,064 were assisted under the Special Recruitment Scheme for mature students. This compares with 808 in 1966/67.

The number of full-time qualified teachers in service continues to increase. In the further education sector this is especially pronounced, the numbers having risen from 1,600 in 1962/63 to 3,154 in 1967/68.

Over 50,000 new places were provided under the School Building Programme in 1967 bringing the total provided since 1946 to 782,731.

The number of students in receipt of financial assistance under the Students' Allowances Scheme increased from 30,937 in 1965/66 to 33,469 in 1966/67.

As with the 1966 volume a Section is devoted to a series of charts depicting trends in various parts of the educational sector over the last few years. The final Section gives statistics for the education authority and grant-aided components within each education authority area.

Finance and awards

Statistics of Education 1967, Volume 5, *Finance and Awards* was published in October 1968. It shows that, of a total educational expenditure by public authorities in England and Wales of £1,571 million in the financial year 1966/67, £1,343 million were for education proper and £228 million for related services such as school meals and milk and students' maintenance grants. Total current expenditure was £1,311 million (excluding loan charges of £124 million). Capital expenditure was £260 million, of which £113 million was financed from revenue and £147 million from loans.

New tables in the volume include one on the costs of teacher training which presents comparative figures of costs per student-year. Another table shows, for each local education authority area, numbers of new awards made by the authority to students at universities and further education establishments and numbers of students from the area entering courses of teacher training; this table previously appeared in the Department of Education and Science *List 69* which has now been discontinued. (The final issue of *List 69* in respect of 1965-66 was published in August 1968; the 1964-65 issue referred to in *Statistical News* page 2.19 was not in fact the final issue).

Reference

Local Education Authorities 1965-66; Secondary education; awards to students; entrants to colleges of education. *List 69* (1966), (HMSO), August 1968 (Price 8s. 0d. net).

MANPOWER

Employment in the public and private sectors

An article in the October 1968 issue of *Economic Trends* gives an account of changes in employment in the public and private sectors of the United Kingdom economy between 1961 and 1967. A sector analysis by industry groups is also given.

For the public sector, separate details are given for H.M. Forces and Women's Services, those in civil employment in the central government sector and employees of local authorities and public corporations.

In the first table accompanying the article, estimates are given of the total numbers employed in each sector at June in each year; these figures are also expressed as percentages of the total employed labour force. A second table shows the distribution of employees in civil employment by sector and by industry group.

Earlier articles on employment in the public and private sectors of the economy appeared in the November 1960 and December 1962 issues of *Economic Trends*. A summary of employment by sector, covering eleven years, is also now included annually in *National Income and Expenditure*.

Civil service manpower

Work on civil service manpower statistics is the responsibility of E. M. Stats. Division of the Treasury, which has become part of the new Civil Service Department.

The main source of data on civil service manpower is the Central Staff Record. This is a continuously updated record with an entry submitted by the employing

department for each permanent and temporary (except short-term) non-industrial civil servant. For each individual the information held includes personal characteristics, details of entry to the civil service, information about career and current grade and, for those who cease to be employed, the reason and information about superannuation payable, if any. The record is kept on magnetic tape and processed by computer as part of the operations of the HMSO Central Computing Bureau. It is fed by departments who notify changes affecting an individual when they occur. The data on the Staff Record is extracted in standing tabulations, at six-monthly or yearly intervals, which show numbers by department, grade, sex, age, etc.; and also by tabulations on special request from within the Treasury or from departments.

In addition returns are collected from departments concerning the total numbers of staff, both industrial and non-industrial, total salaries and wages, the numbers of civil servants who are aliens or disabled persons, etc.

Using these sources an annual booklet called *Civil Service Manpower* is produced for internal use in the Treasury and in departments. It contains tables giving strength, recruitment, wastage and promotion for staff in the civil service as a whole, in each staff group (fifteen broad groupings of grades) and in the main classes of the civil service. Copies have been made available in the past to university departments, etc. and requests to Mr. J. C. Drown, Civil Service Department, Whitehall, London, S.W.1 for the 1968 edition will be met as far as stocks allow.

A Quarterly Staff Return is also produced for internal use showing the strength of the civil service and individual departments by employment status and sex. A summary of non-industrial staff figures appears in the *Monthly Digest of Statistics* and annual figures are given in the *Annual Abstract of Statistics*. The latter also contains a staff group analysis of non-industrial staff and departmental totals of industrial staffs together with total numbers of men and women employed.

In addition to producing regular statistical information E. M. Stats. Division is responsible for the application of statistical methods to data on the civil service and to problems of staff management. Forecasts are made of the availability and requirements of staff, involving the analysis of current and past statistics to identify changing trends in the civil service and its constituent parts. The statistical aspects of sample surveys on matters affecting the management of the civil service are also dealt with, for example, in a recent 'Study of factors affecting ability, efficiency and job-satisfaction among Executive Officers and Clerical Officers' and a 'Survey of Wastage of Executive and Clerical Officers'. Interim reports on both these enquiries were published in September in Volume 3 of the Fulton Report.

In addition, a continuing survey on the amount and causes of sick leave among non-industrial civil servants has just been started. A forecast of the size and broad composition of the civil service five years ahead is produced annually, based on replies which departments give to the annual Public Expenditure Survey.

Volume 4 of the Fulton Report, *Factual, Statistical and Explanatory Papers*, contains a great deal of statistical information on civil service manpower, recruitment, structure, training, careers and career management.

Plans are in hand for adding to the Staff Record information on the two highest qualifications held by an individual. The level of qualification identified will start with G.C.E. 'O' level and equivalent qualifications. Work on manpower models is being carried on both within the department and in association with Professor Bartholomew, University of Kent.

The electronic computer for the Staff Record has only recently been installed. It will provide speedier and more sophisticated analyses of data, and permit of developments arising from the Fulton Report, involving a considerable expansion of the statistical work associated with civil service manpower, particularly as regards career planning. The possibility of a comprehensive personnel record system linked with current pay records is being studied.

References

The Civil Service, (Fulton Report), Vol. 1, Cmnd. 3638, (HMSO), June 1968 (Price 17s. 6d. net); Vol. 3 (2) *Survey of Investigations*, (HMSO), September 1968 (Price £1 17s. 6d. net); Vol. 4 *Factual, Statistical and Explanatory Papers*, (HMSO), June 1968 (Price £2 13s. 0d. net).

Employment of scientists, engineers and technologists

The report on the *Flow into Employment of Scientists, Engineers and Technologists* was published on 24th September 1968 as Cmnd. 3760. It was prepared by a Working Group of the Committee on Manpower Resources for Science and Technology; the Working Group was chaired by Professor M. M. Swann, Principal of the University of Edinburgh. The report confirms the tentative findings of the interim report published (as Cmnd. 3102) in October 1966 that there are serious imbalances between the supply of, and demand for, qualified scientists and technologists. The report highlights the concentration of scientific talent in the pure research sector, particularly universities, and the very significant movement abroad, with a consequent starving of industry and schools.

The present and prospective future flows of qualified manpower from higher education, and the ways in

which it is employed, are described. Discussion follows of the problems, firstly, of ensuring a sufficient supply of qualified manpower, particularly of the most able graduates, for industry and schools; secondly, of devising an education in science and technology suitable for a wide variety of jobs and not likely to become outdated. Short-term measures and longer-term reforms are proposed.

Statistics of science and technology

The second issue of *Statistics of Science and Technology*, for 1968, is due to appear in November 1968. It includes the results of the survey of expenditure on scientific research and development work done in the United Kingdom in 1966-67. This survey is the first in an annual series which follows the previous triennial surveys. Expenditure in 1966-67 in the United Kingdom, exclusive of expenditure overseas, is estimated at £883 million, which represents about 2·7 per cent of the gross national product at factor cost; this is the same proportion of the gross national product as in the earlier years 1964-65 and 1961-62. Even though there is some lack of comparability in the figures for the different years, they point to changes in the distribution of total research and development between the various sectors. Due to a relative decline in defence research and development, the proportion of all research and development *carried out within* the government sector has declined to 22 per cent in 1966-67, whilst the proportion carried out within private industry has risen to 63 per cent. The proportion of research and development expenditure *financed by* Government declined to one-half in 1966-67 whilst the private industry share of financing rose to 40 per cent.

Other sections of the volume deal with aspects of scientific and technological manpower, including stock and deployment, new supply and students and staff in educational institutions. Section X of the volume contains results from the 1966 survey of professional engineers who were members of institutions participating in the Council of Engineering Institutions. A selection of the results of the survey were presented earlier in *The Survey of Professional Engineers 1966* published jointly by the Ministry of Technology and the Council of Engineering Institutions – see *Statistical News*, page 2.20.

PRODUCTION

Movement of manufacturing industry

The results of Board of Trade research on *The movement of manufacturing industry in the United Kingdom, 1945-65* were published in September 1968. The report describes and analyses new data about the volume, direction, industrial composition and other aspects of the movement of manufacturing industry within, and into, the United Kingdom in the period 1945-65, movement meaning approximately the opening of a new establishment in one or other of fifty areas of the country by a non-local firm.

Only establishments employing 10 or more people were included. The results are analysed by industry and on a geographical basis. The study was summarised in the *Board of Trade Journal*, 13 September 1968.

Reference

The movement of manufacturing industry in the United Kingdom, 1945-65, (HMSO), September 1968 (Price 8s. 6d. net).

Industrial Development Certificates refused

Statistics of industrial development certificates refused, with an analysis of numbers and floor space by planning regions, were published for the first time in the *Board of Trade Journal*, 23 August 1968, and in the eighth annual report, covering the year ended 31 March 1968, by the Board of Trade under the Local Employment Acts 1960 to 1966. Industrial development certificates were first issued in July 1948 under the Town and Country Planning Acts 1947, and statistics of the floor space of industrial building approved by the Board of Trade by the issue of certificates are published quarterly in the *Board of Trade Journal*. Hitherto comprehensive statistics of applications for certificates which have been refused have not been published, largely because they are not an accurate measure of the amount of industrial building which might have taken place had there been no control. The publication of the numbers of refusals and the floor space involved meets a growing interest in regional problems and a need for additional information, despite the above reservations.

Regional analysis of public investment in new construction

The *Abstract of Regional Statistics 1968* includes estimates of public investment in new construction analysed by standard regions for the three financial years 1965/66 to 1967/68. Public investment in new construction covers capital expenditure on dwellings, other new buildings and works by public corporations, the central government, local authorities and universities.

Although the estimates for 1967/68 are based on incomplete data, and are thus less reliable than those for the earlier years, the demand for more up-to-date figures than have been published hitherto suggested that the compilation of provisional estimates would be worthwhile. In addition, it has been possible to allocate to specific regions certain expenditure by local authorities which previously could not be so allocated.

Reference

Abstract of Regional Statistics 1968, (HMSO), September 1968 (Price 12s. 0d. net).

Innovation in chemical process plant

The August issue of the *National Institute Economic Review* contained an article on 'Chemical process plant: innovation and the world market' giving the results of an inquiry into the origins of chemical process plants erected in all parts of the world between 1960 and 1966. The study, which was directed by C. Freeman of the University of Sussex, is the third of a series designed to elucidate the relationship between research, innovation and market performance in various industries. The first two studies, on plastics and electronics, were published in the issues of the *Review* for November 1963 and November 1965.

The study shows that, like many other technically advanced industries, the chemical plant contracting business is dominated by American firms, which handled an average contract size nearly twice as great as their European competitors and won nearly two-thirds by value of world export contracts. The United Kingdom's share was less than $8\frac{1}{2}$ per cent.

The competitive advantages of the United States contractors include their innovations in design, which facilitate the exploitation of economies of scale, and the flow of process innovations made available to them by the oil and chemical companies, which often work closely with them in design work and 'first plant' construction. The article suggests that other countries, including the United Kingdom, could benefit from the wider practice of such collaboration, which in the United States is seldom based on vertical integration.

Copies of the August 1968 issue of the *Review* can be obtained from The National Institute Economic Review, 2 Dean Trench Street, Smith Square, London, S.W.1; copies of earlier issues can be ordered from Wm. Dawson & Sons Ltd., Cannon House, Park Farm Road, Fokestone, Kent.

World power conference

Mr. C. I. K. Forster, Director of Statistics, Ministry of Power, was among the participants in the World Power Conference held in Moscow from 20–24 August 1968. He submitted a paper under Section B (Energy Balances) entitled 'New Developments in the Statistical Framework for Reviewing Fuel Policy in the United Kingdom' covering ground similar to Appendix I of the White Paper on Fuel Policy (see *Statistical News* No. 1, page 24), with up-to-date information on the construction of the integrated model of the fuel economy described in pages 3.1 to 3.6 of this issue.

Another paper submitted to Section B dealt with a model under construction for the energy sector of the Canadian economy closely resembling the British model.

PRODUCTIVITY

Output and labour costs

New statistical series on output per head and costs per unit of output are published in the October issues of *Economic Trends* and the *Employment and Productivity Gazette*.

In collaboration with the Department of Employment and Productivity the Central Statistical Office has produced for the whole economy an annual series from 1950 showing output, employment and output per head, together with a quarterly series for 1960 onwards. Corresponding quarterly series beginning in 1960 are given for production industries, manufacturing, engineering and electrical goods, vehicles, textiles, metal manufacture, mining and quarrying and gas, electricity and water.

New costs series also appear. These show for the whole economy total costs, wages and salaries, and labour costs per unit of output. For the same groupings as in the output tables there are series for wages and salaries, and labour costs. Corresponding to these annual series there is a quarterly table beginning in 1960 for total home costs and for wages and salaries per unit of output. Definitions and explanations are given in the article accompanying these new series.

Labour costs

The Department of Employment and Productivity has now published the full results of the survey undertaken in 1964 into employers' total labour costs. The booklet includes the tables already published in the December 1966 and March 1967 issues of the *Ministry of Labour Gazette*, and also some more detailed analyses for selected industries, with separate tables for administrative, technical and clerical workers and operatives.

This was the first comprehensive survey of labour costs to be conducted in Great Britain. A further enquiry on similar lines is being held during 1968 in Great Britain and on this occasion in Northern Ireland also. The current enquiry will provide information about the changing structure and level of labour costs since 1964, including the effect of the Industrial Training Act, the Redundancy Payments Act and the Selective Employment Payments Act. In addition valid comparisons should be practicable with the latest EEC enquiry.

Reference

Labour costs in Great Britain in 1964, (HMSO), November 1968, (Price 8s. 6d. net).

AGRICULTURE

Farm classification

A new analysis of the economic structure of agriculture, made possible by the introduction of automatic data

processing, has been published in an annual series of statistics beginning in 1963 under the title *Farm Classification in England and Wales*. The basis of the new statistics is a classification of all holdings returned in the June Agricultural Census, according to their type of farming. Thirteen types of farming are defined by reference to the percentage distribution of the activity on a holding among the various enterprises such as dairying, livestock rearing and fattening, pigs, cropping, etc. For this purpose activity is measured by the standard, or average, annual labour requirements of the items of cropping and stocking recorded for the holding on the Census returns, expressed in standard man-days (s.m.d.) of 8 hours of adult manual labour. These requirements are assessed from studies by university agricultural economists of labour usage for specific agricultural products. Standard labour requirements have also been used to classify the holdings by size of business defined as the total standard labour requirements of the cropping and stocking on the holding *plus* an addition for maintenance and other necessary overhead labour. Holdings of less than 275 standard man days, that is with a standard labour requirement amounting to less than a year's work for one man, are not classified by their type of farming. The remainder, about a half of the holdings in England and Wales, are classified by type of farming and three size-of-business groups corresponding broadly to one or two-man businesses (275 to 599 s.m.d.), two or three-man (600 to 1,199 s.m.d.), and four or more (1,200 s.m.d. and over). The statistics from 1965 onwards show the distributions among types of farming and sizes of business of holdings, crop acreages, livestock numbers and workers and of total activity in standard man days, for England and Wales and for eight regions.

Holdings in Scotland and Northern Ireland have been classified by type of farming on similar principles, although in Northern Ireland the contributions of the different enterprises are measured by their gross margins (a partial profit measure which is the output of an enterprise *less* its variable costs) instead of their labour requirements. Standard labour requirements are used in both of these countries to define sizes of business, as in England and Wales. The Agricultural Departments' annual sample surveys of farm accounts are analysed by the same methods of farm classification as the agricultural censuses. There is thus available for all parts of the United Kingdom an analysis of both the physical and financial data of the agricultural industry showing the importance and characteristics of the structural sectors which make up the whole. This comprehensive analysis was presented for the first time in 1966 in *The Structure of Agriculture* and will be developed further as more data accumulate. Such an analysis describes the structure of farming in terms of degree of specialisation or diversification; scale of operations; and the combinations in which commodities are produced. In addition it enables differences and trends to be seen in the economic performance of each sector of the industry.

This new information provides a basis for the Government's policies for agriculture in the form of the grants and price guarantees which are determined annually and the measures for improving farm structure which have been introduced recently. The classification of farms is of benefit also to the existing statistical work of the Ministry since it opens up possibilities of more efficient sampling in survey work. Another development is the study of the geographical distribution of agriculture by mapping holdings of various types and sizes. Computer analysis has enabled a start to be made and an experimental map has been published in conjunction with the Rothamsted Experimental Station and I.C.I.

References

L. Napolitan and C. J. Brown, 'A type of Farming Classification of Agricultural Holdings in England and Wales According to Enterprise Patterns', *Journal of Agricultural Economics*, Vol. XV 1963, pp. 595-616.

Farm Classification in England and Wales 1963, (HMSO), 1965 (Price 5s. 6d. net).

Farm Classification in England and Wales 1964/65, (HMSO), 1967 (Price 4s. 6d. net).

Farm Classification in England and Wales 1966, (HMSO), 1968 (Price 17s. 6d. net).

Farm Incomes in England and Wales 1966, (HMSO), 1968 (Price 14s. 6d. net).

The Structure of Agriculture, (HMSO), 1966 (Price 3s. 6d. net).

'A type of farming map based on agricultural census data'. I.C.I. *Outlook on Agriculture*, Vol. V Number 5, 1968, pp. 191-196.

A Century of Agricultural Statistics in Great Britain 1866-1966, (HMSO), 1968 (Price 17s. 6d. net).

TRANSPORT

Highway Statistics 1967

Highway Statistics 1967 is due to be published in November 1968. Among the regular features are analyses of vehicles licensed and new registrations, road traffic, road expenditure, and passenger and freight traffic by road.

New material published for the first time this year includes tabulations of private cars and vans licensed in the third quarter of 1966 and 1967 by engine size and year of first registration. These were derived from the vehicle licence censuses.

Estimates of the total vehicle mileage run on the roads of Great Britain have been revised in the light of results obtained by the Road Research Laboratory from a 1966-67 survey consisting of short-period counts at 1,300 sites. These benchmark figures are extrapolated by reference to monthly automatic and manual counts which now include manual counting at 200 sites instead of 50.

Maps have been included which give a summary picture of the volume of traffic flows passing about 700 points on the trunk road system of Great Britain. The data used were derived from the 1965 traffic census, the latest in the series of large-scale traffic census.

First results of the 1965 National Travel Survey are also given. These cover vehicles used by households and show average daily and weekly mileages, vehicle ages, engine size and estimated value of the vehicles and other analyses.

Reference

Highway Statistics 1967, (HMSO), November 1968 (Price £1 1s. 0d. net).

OVERSEAS FINANCE

Balance of payments

The 1968 issue of the balance of payments Pink Book contains a number of new tables, including material on invisibles described in the article on pages 3.15 to 3.19 of this issue. A new section in Annex 4 provides estimates of the *cash transactions in direct investment abroad.* The investment and disinvestment which go towards the net investment recorded in the balance of payments total take the form partly of unremitted profits and other transactions (e.g. the export of goods on credit) which do not involve flows of cash. Rough estimates have been made, by distinguishing between cash and other transactions, of the extent to which direct investment abroad impinges on the United Kingdom's reserves and sterling liabilities. The estimates for 1965 and 1966 taken together indicate that about a tenth of gross investment in the non-sterling area directly affected the reserves of sterling liabilities in the period and about one-third of gross investment in the overseas sterling area. An accompanying note explains and qualifies the estimates.

The notes and definitions section has been expanded to include a note (page 69) on the *effect on the accounts of the devaluation of sterling* in November 1967 and *reliability gradings* for the estimates of current account transactions (page 72).

Reference

United Kingdom Balance of Payments 1968, (HMSO), September 1968 (Price 12s. 6d. net).

Inventory of external assets and liabilities

The Bank of England have compiled a new inventory of U.K. external assets and liabilities as at the end of 1967. The new estimates, which take account of the effects of devaluation last year, are published in the September issue of the Bank's *Bulletin* alongside estimates for 1962, 1964 and 1966, some of which have been revised since they were published in earlier issues of the *Bulletin*.

An article accompanying the estimates explains how the figures are calculated, describes their limitations, and analyses the changes between 1966 and 1967.

The figures are reproduced in a slightly different form in the C.S.O. publication *United Kingdom Balance of Payments 1968*, where they are compared with overseas transactions as recorded in the balance of payments statistics.

Offprints of the Bank's article and copies of the Bank's *Bulletin* can be obtained free of charge from the Economic Intelligence Department, Bank of England, London, E.C.2.

Overseas investment and other overseas transactions

The annual reports on the inquiries into overseas investment, trade credit and royalties, etc. appeared in the issues of the *Board of Trade Journal* for 19 July, 16 August and 23 August 1968. A report on overseas earnings and expenditure for films and television programmes appeared in the issue of 3 May.

CONSUMERS' EXPENDITURE

Family Expenditure Survey, Report for 1967

The report for 1967 published recently is the first based on the enlarged sample of nearly 11,000 households. Most of the tables are similar to those in previous reports, but on this occasion there are analyses of household income and expenditure according to the type of administrative area in which the household is situated. Such tables last appeared in the report for 1964.

Reference

Family Expenditure Survey, Report for 1967, (HMSO), (Price £1 7s. 6d net).

Wine and British wine

Figures for imports of wine are published monthly in the *Overseas Trade Accounts* but many of these import consignments are delivered (for stock) into bonded warehouses. A better indicator of consumption of wine is therefore provided by the figures of quantities which have paid duty (though even these need to be interpreted with some caution as the size of duty-paid stocks, while unknown in magnitude, can undoubtedly fluctuate considerably).

Quantities of wine and British wine paying duty are shown in the *Monthly Digest of Statistics*, Table 44. Following consultations with the wine trade, H.M. Customs and Excise are now introducing regular monthly returns providing this information in considerably greater detail. The returns will be sent to subscribers about two months after the end of the month to which the latest figures relate. The subscription fee is 10s. 0d. for the first six copies, covering quantities

which pay duty during the months July to December 1968; and the subscription fee will be £1 per annum thereafter. Subscriptions to this bulletin should be sent to: Bill of Entry Section, H.M. Customs and Excise, 27 Victoria Avenue, Southend-on-Sea, Essex.

Betting and gaming duties

H.M. Customs and Excise produce regular monthly returns of receipts from the betting and gaming duties. The returns distinguish receipts of the general betting duty from on-course bookmakers, from off-course bookmakers and from totalisators on horse-racing and on dog-racing; of the pool betting duty from pool betting and from fixed odds coupons betting; of the gaming licence (premises) duty and of the gaming machine licence duty. Quarterly estimates are also given of the percentages of the general betting duty paid by on-course bookmakers on dog-racing.

The general betting duty and the pool betting duty are charged *ad valorem* on stakes and it is possible therefore to derive from these figures of duty payments the total size of stakes; though the payment arrangements can distort the receipts in a particular calendar month. Gaming is chargeable by means of annual licences at values related to the rateable value of the premises at which the gaming takes place; and the receipts of duty indicate therefore the number of premises licensed for gaming. Gaming machines are chargeable by means of annual licences at values related to the value of the coin used to operate them; and the receipts of this duty indicate therefore the number of licensed gaming machines.

The subscription fee for these monthly returns is £1 per annum. Subscriptions should be sent to: Bill of Entry Section, H.M. Customs and Excise, 27 Victoria Avenue, Southend-on-Sea, Essex.

PRICES

Retail food prices

Since the beginning of April 1968, the Ministry of Agriculture, Fisheries and Food has been issuing a fortnightly Press Notice reporting on trends in retail food prices. The information comes mainly from the Ministry's Retail Prices Survey, which was started in October 1966 to provide Ministers with frequent and up-to-date information on retail food prices.

The survey, which is dependent on voluntary co-operation, covers nearly 500 independent retailers (butchers, fishmongers, grocers and greengrocers) in 50 towns in the United Kingdom, and 15 multiple butchers with about 1,100 outlets, who report each week, by post, the most usual prices being charged in their shops on the Tuesday for a selected list of items. The prices of about 70 items are collected in this way.

In addition, fortnightly price lists are received from about 30 multiple grocery firms and co-operative societies, covering some 2,500 outlets. These give the prices of the 70 items reported by the independent shops, and also of 100 fast selling branded foods.

The survey was set up with the aid of advice from the Ministry's Advisory Group on the Retail Food Trades, and after consultations with Trade Associations. The Advisory Group meets at intervals to discuss the trends shown by the survey and other matters.

The average prices derived from the survey are not considered sufficiently accurate for publication. Average retail food prices derived from the Index of Retail Prices are, however, published monthly by the Department of Employment and Productivity – see *Statistical News* page 1.32.

Wholesale prices of fruit and vegetables

With the introduction of statutory grading for certain fruit and vegetables, it has been possible to collect and publish more detailed and accurate price statistics for these products. Statutory grading was introduced in Great Britain for apples and pears on 17 July 1967, for cucumbers on 15 January 1968, and for tomatoes and cauliflowers on 13 May 1968.

Wholesale market prices for these types of home grown produce are collected by class at nine major markets in England and Wales and at four markets in Scotland. Some of the prices are already published weekly in the *Agricultural Market Reports* issued by the Ministry of Agriculture, Fisheries and Food and the Department of Agriculture and Fisheries for Scotland; others will be published in due course. The annual volume of *Agricultural Statistics* (England and Wales) will show monthly prices for England and Wales both by class and as a single overall price, using estimates of the proportions marketed in each class as weights. There will thus be a continuous link with the series of wholesale prices published previously.

RESEARCH

Constancy of regression relationships over time

Professor J. Durbin and Mr. R. L. Brown presented a paper entitled 'Methods of investigating whether a regression relationship is constant over time' to a meeting on Statistics, Econometrics and Management Science held in Amsterdam from September 2-7, 1968. The paper, which is a progress report summarising work done to date in the Central Statistical Office, has been published in Mathematical Centre Tracts, 26, Selected Statistical Papers 1, pages 37-45.

Regression analysis of time series data is usually based on the assumption that the regression relationship is constant over time. In some applications, parti-

cularly in the social and economic field, the validity of this assumption is open to question. The authors consider a number of techniques for bringing out in a graphic way whatever departures from constancy are present in the data.

A complete account of the work, including proofs of the theorems and illustrations of the use of the methods is being prepared for publication. A computer package is also being developed.

INTERNATIONAL

U.N. Compendium of Social Statistics 1967

The *Compendium of Social Statistics 1967* is a revised and updated edition of the 1963 *Compendium.* Like the latter it comprises basic statistical indicators required for describing the major aspects of the social situation in individual countries of the world and its regions as well as changes and trends in the levels of living over the decade ending in 1964. It thus attempts to systematize the assembling of basic statistics for the U.N. Report on the World Social Situation. It is organised into eight sections each of which contains a varying number of tables dealing with subjects which roughly parallel the components and background information designed for the international definitions and measurements of levels of living. It includes 62 tables which cover as far as possible analytical rates, index numbers, ratios and similar devices: the emphasis is on trends rather than on levels. The main difference between the revised edition and that for 1963 is the omission of a section on social security benefits.

References

Compendium of Social Statistics 1967, United Nations publication (Sales No. 67 XVII 9).

Report on International Definitions and Measurements of Standards and Levels of Living, United Nations, March 1954 (Sales No. 54 IV 5).

International Definition and Measurement of Levels of Living: and Interim Guide, United Nations publication (Sales No. 61 IV 7).

International Statistical Year for Research and Development

The growing recognition of science and technology as an important factor in the economic and social progress of the OECD led the member countries to make a major effort to improve their statistics on scientific research and development. A manual of standard definitions and procedures was drawn up in 1964 (the 'Frascati Manual') and an International Statistical Year was arranged for the purpose of collecting comparable data based on this manual in respect of the years 1963 or 1964.

The results are being published in a series of OECD reports, the first being *The Overall Level and Structure of R & D Efforts in OECD Member Countries* which was published at the end of 1967. Volume 2, containing the detailed statistical tables and notes, appeared in September 1968. Other reports will be concerned with research and development in various sectors: business enterprise, government, higher education and the private non-profit sector.

Reference

International Statistical Year for Research and Development: Volume 1, *The Overall Level and Structure of R&D Efforts in OECD Member Countries*, (OECD) 1967: Volume 2, *Statistical Tables and Notes* (OECD) 1968.

United Nations regional statistical meetings

The Economic Commission for Europe (ECE), the Economic Commission for Africa (ECA) and the Economic Commission for Asia and the Far East (ECAFE) have given provisional dates of meetings of the Conferences of European, of African and of Asian Statisticians and their working groups as follows:

ECE

The following are the dates of meetings (held in Geneva except where indicated otherwise) in the programme of the Conference of European Statisticians to take place before the end of 1968:

1968	
30 September–4 October	Working Group on Electronic Data Processing (held in Bucharest)
1– 3 October	Working Group on Terminology for National Accounts, in English, French and Russian
11–15 November	Joint Ad Hoc Group of Experts on Statistical Requirements for Economic Models and Planning
25–29 November	Working Group on Industrial Statistics
16–20 December	Working Group on Statistics and Indices of Prices and Quanta

Dates have not yet been fixed for meetings to be held after 1 January 1969. The tentative plans for these meetings are as follows:

1969 (*January–June*)	
6–10 January	Group of Experts on Agricultural Producers' Prices and Related Index Numbers
3–7 March	Working Group on Statistics of Education
March	Group of Rapporteurs on Links between the U.N. System of National Accounts and the Material Product System
	Working Group on National Accounts and Balances

May — Working Group on Statistics of Scientific Research

June — Consultation with International Organisations on Current Economic Indicators

Group of Rapporteurs on Statistical Activities of ECE

Seventeenth Plenary Session

During the first half of 1969 a meeting will also be held on Energy Statistics, but it is not yet possible to indicate a date for the meeting.

1969 (*July–December*)

September — Working Group on National Accounts and Balances and related subjects (balance sheets, statistics of income distribution, general review of developments)

October — Working Group on Statistics and Indices of Prices and Quanta

November — Working Group or Group of Rapporteurs on A System of Social and Demographic Statistics

In addition, it is also intended to hold the seminar on regional statistics during the second half of 1969. Most of the other meetings included in the provisional programme of work for 1969/70 will probably be held during the first half of 1970.

ECA

The following meetings (to be held in Addis Ababa) are so far the only ones in the programme of the Conference of African Statisticians to the end of 1968.

1968

4–13 November — Seminar on the Application of Demographic Statistics and Studies in Development

9–14 December — Working Group on Income Distribution Statistics

ECAFE

A meeting of the Working Group on Migration Statistics was held in October.

The following are the dates of further meetings (to be held in Bangkok, except where otherwise indicated) in the programme of the Conference of Asian Statisticians for 1968 and 1969:

1968

25 November–2 December — Regional Seminar on Distributive Trade Statistics or Regional Seminar on Price Statistics

1969

2–16 June — Conference of Asian Statisticians (9th Session)

30 June–31 July — Seminar on data Processing of Population/Housing Census Data (to be held in Wiesbaden)

December — 5th Session of Working Group on National Accounts: Household Sector Statistics

37th Session of the International Statistical Institute

At the invitation of the Royal Statistical Society the 37th Session of the International Statistical Institute will be held in London from 3–11 September 1969 under the patronage of Her Majesty The Queen.

The Organising Committee is issuing a series of Information Bulletins and the following details are extracted from Bulletin No. 1.

The 37th Session will take place in the Senate House of the University of London, Malet Street, London S.W.1. with concurrent sessions at the adjacent School of Hygiene and Tropical Medicine. Some special arrangements for official statisticians taking part are under discussion. Details will appear in a later issue of *Statistical News*.

The Bureau of the International Statistical Institute, on the recommendation of the Programme Committee, has prepared the following provisional programme. Further particulars, including names of authors of invited papers, titles of papers and the names of those invited to lead discussions will be provided in Information Bulletin No. 2, to be issued in January 1969.

1. Uses and limitations of regression techniques
   Organiser: C. R. Rao
2. The impact of the computer on methods of statistical analysis
   Organiser: M. J. R. Healy
3. Data banks, including questions of confidentiality
   Organiser: J. Ch. W. Verstege
4. Decision problems in marketing
   Organiser: H. S. Sichel
5. Problems of capital planning
   Organiser: B. Barberi
6. Manpower projection (Joint meeting with the International Union for the Scientific Study of Population)
   Organiser: H. P. Lacroix
7. Index-number problems in the measurement of capital stock
   Organisers: K. M. Archer and F. B. Horner
8. Optimal stopping rules and sequential design
   Organiser: F. Mosteller
9. Multiple contingency tables
   Organiser: H. O. Lancaster

10. Statistical topics in operational research (Joint meeting with the Royal Statistical Society)
    Organiser: P. Whittle
11. Statistics in the physical sciences (Meeting under the auspices of the International Association for Statistics in the Physical Sciences)
    Organiser: M. S. Bartlett
12. Evaluation of social programmes
    Organiser: R. Wagenfuhr
13. Practical applications of stochastic processes
    Organiser: Elizabeth L. Scott
14. A meeting for two review papers:
    (a) Seasonal adjustment procedures by J. Shiskin
    (b) Cluster analysis by L. N. Bolshev

Correspondence
All correspondence relating to the 37th Session should be addressed to: The Secretary, Organising Committee, 37th Session of the I.S.I., 11 Whitehall Court, London, S.W.1.

PUBLICATIONS

Vital statistics (Scotland)

Publication of the first *Quarterly Return for 1968* was delayed by the change from the 7th to the 8th revision of the International Classification of Causes of Death. (See *Statistical News*, page 1.14.)

The 1967 *Annual Report of the Registrar General for Scotland* is due to be published in November or December 1968.

A review of the range and presentation of the *Annual Report* is under way, with the object of revising the contents and eliminating delays in publication. The completion of the review and the implementation of all the changes necessary will depend largely on the availability of resources in the General Register Office, but it may be possible to introduce at least a few improvements in the 1968 *Annual Report*.

Greater London

Quarterly Bulletin No. 4 (October 1968), produced by the GLC Research and Intelligence Unit, contains the following articles:

'Environmental noise in London' by Dr. R. J. Stephenson, GLC Scientific Branch

'The application of linear programming in GLC Parks Department' by B. J. Morgan and L. R. Shields, GLC Establishments Department

'Changes in the boundaries of the Metropolitan Police District and the Greater London Conurbation since 1946' by Eric J. Thompson, GLC Research and Intelligence Unit

'Analyses of census data for Great London' by Eric J. Thompson

'Progress report on the Brent information system' by John W. Fall, GLC Research and Intelligence Unit

'Urban life styles' by Professor T. Burns, University of Edinburgh

'The spatial structure of city regions' by Professor P. Haggett, University of Bristol

Reference

Quarterly Bulletin of the Research and Intelligence Unit of the Greater London Council, No. 4, October 1968. Obtainable from the Information Centre, The County Hall, London, S.E.1 (Price 5s. net).

Social Science Research Council

The May issue of the *SSRC Newsletter* contained an article on the SSRC experimental survey data bank at Essex University and notes on an enquiry into the careers of recent graduates in economics and statistics and *Forecasting and the Social Sciences*, a collection of papers on forecasting published by Heinemann Educational Books Ltd.

A list of titles and descriptions of research was published in *Research Supported by the SSRC* in June 1968.

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.

National accounts statistics: Sources and methods

National accounts statistics: Sources and methods, edited by Rita Maurice (Central Statistical Office), Studies in Official Statistics No. 13 was published on 30 September 1968 (price 45s., by post 49s. 6d.). This book brings together information on a wide range of statistical material used in compiling the national accounts and brings up to date the description published twelve years ago (see *Statistical News* No. 2, page 2.27 for a detailed note on this publication).

GOVERNMENT STATISTICAL SERVICE

Appointments

BOARD OF TRADE

The post of Director of Statistics has been upgraded to Deputy Secretary level. *Mr. J. Stafford, C.B.* will continue to hold the post.

Miss J. M. Maton, C.B.E., Deputy Director of Statistics, retired in September. She joined Statistics Division in 1946 from Cadbury Brothers Ltd. She had wide experience of economic statistics, first taking charge of the pilot Census of Distribution and the design of the first full Census for 1951. Miss Maton was responsible for many improvements in overseas trade statistics, not least the adoption of the Standard International Trade Classification, whose importance she quickly recognized. She played a major part in building order book statistics, and latterly contributed to the development of economic reporting and forecasting.

Mr. A. G. Carruthers has succeeded Miss Maton as Deputy Director of Statistics.

Two further appointments have been made at Under Secretary level. *Mr. G. Penrice*, formerly Chief Statistician in the Ministry of Housing and Local Government, has been appointed Assistant Director. *Mr. M. C. Fessey* has been promoted to the new post of Director of the Business Statistics Office. The B.S.O. will be developed out of the Census Office at present located at Eastcote, Middlesex.

CENTRAL STATISTICAL OFFICE

Dr. S. Rosenbaum, formerly a Chief Statistician in H.M. Treasury, has transferred to C.S.O.

TREASURY

Mr. A. R. Smith, formerly a Chief Statistician in the Ministry of Defence, has transferred to H.M. Treasury and subsequently to the new Civil Service Department.

MINISTRY OF HOUSING AND LOCAL GOVERNMENT

Mr. B. C. Brown, formerly a Chief Statistician in the Department of Economic Affairs has transferred to the Chief Statistician post in the Ministry of Housing and Local Government.

Survey control unit

A survey control unit has now been set up in the Central Statistical Office. Its functions include the examination of statistical forms and questionnaires sent out by government departments and other public bodies in order to eliminate unnecessary duplication between inquiries and to ensure that definitions are, as far as possible, compatible with accepted practices and standards. Comments and suggestions about these matters may be addressed to the survey control unit at the Central Statistical Office.

Computers for statistics

An appreciable percentage of the total working time of some 22 computers is now used in government for the production and/or processing of statistics. The accompanying list shows the location, type of computer and type of statistics produced (page 3.38).

Several other computer installations, shown in the second part of the list, produce or process statistics on a small scale either as a by-product of their main processes or on a bureau type service to Departments.

During 1968 five additional computer systems will be delivered and will be partly utilised for statistical processing:

Ministry of Agriculture, Fisheries and Food	ICL 1907
Department of Education and Science	ICL 1904E
Home Office and Metropolitan Police	ICL 1904E
Ministry of Social Security	ICL System 4–70
H.M.S.O. Central Computing Bureau	ICL 1904E

These systems will augment or replace the computers in the first part of the list.

Computers on which an appreciable percentage of work is devoted to the production and/or processing of statistics

Department	*Location*	*Computers*	*Type of statistics produced and/or processed*
Ministry of Agriculture, Fisheries and Food	Guildford	3 × English Electric DEUCE 1 × Elliott 803	Processing of agricultural censuses, and fishery statistics; farm incomes; National Food Survey; economic and research statistics
Department of Education and Science	London	1 × ICT 1301	Processing statistics for the annual publication *Statistics of Education*; analysis of traders' records, and a curriculum survey
Ministry of Health	Fleetwood	1 × Elliott 4120	Statistical processing of doctors' and dentists' remuneration; prescription costs analysis; mental health statistics; hospital staff statistics
Home Office and Metropolitan Police	London	2 × ICT 1301	Processing of national criminal statistics
Ministry of Social Security	Newcastle-on-Tyne	1 × LEO II	Analysis of sickness, injury and disablement benefits; analysis of pensions and family allowances; classifications of the insured population
Board of Trade	Eastcote	1 × LEO III	Processing censuses of production and distribution, the wholesale prices index, retail sales index, overseas trade enquiry: seasonal adjustments and analysis of time series
Department of Employment and Productivity	Watford	1 × ICT (EMIDEC) 1100	Monthly and annual statistics of employment, unemployment and available vacancies; statistics of earnings and hours worked; food prices; index of retail prices; Family Expenditure Survey
General Register Office	Titchfield	1 × IBM 705 1 × IBM 1401	Processing of Censuses of Population
Ministry of Public Building and Works	Hastings	2 × ICT 1301 2 × ICT 1302	Construction industry statistics
Customs and Excise	Southend	1 × LEO III	Monthly trade accounts; annual trade statistics; Import Reserve Statistics
Inland Revenue	Worthing	1 × LEP III	Analysis of major sources of revenue arising from direct taxation
Scottish Office Computer Bureau	Edinburgh	1 × IBM 360/40G	Supplies a computing service to the four Scottish Departments; covers a wide range of statistics including the fields of health, education, crime, agriculture and housing
H.M.S.O. Central Computing Bureau	London	1 × ICT 1904/3	Processes a wide range of statistics for various departments
Ministry of Housing and Local Government	London	1 × Monrobot XI	Processing of statistics for Royal Commission on Local Government

Computers used occasionally for the production of statistics

Department	*Location*	*Computers*	*Main use*	*Type of statistics produced*
Ministry of Defence (Navy)	Bath	1 × ICT 1300	Bill paying	Financial
(Army)	Worthy Down	2 × IBM 705 1 × IBM 360/30	Military pay	Manpower; seasonal adjustments
(Army)	Chelwell	1 × ICT 2400	Stock control	Storeholding
(Army)	Donnington	1 × ICT 2400	Stock control	Storeholding
(Air)	Hendon	2 × AEI 1010	Stock control	Storeholding
(Air)	Cheadle Hulme	1 × ICT 1100	Civilian pay and records	Civilian manpower
(Air)	Innsworth	1 × Univac 1107	Air Force personnel pay and records	Manpower
(Army)	Woolwich	1 × ICT 1904	Feedback of workshop information	Repair and maintenance
(Air)	High Wycombe	1 × Elliott 803	Research	Repair and maintenance
Exports Credits Guarantee Dept.	London	1 × IBM 1401G	Finance	Financial
National Physical Laboratory	Teddington	1 × English Electric KDF9	Research	General (used occasionally by three Departments)
Ministry of Technology	Farnborough	1 × ICT 1907	Research	Programme survey
,, ,,	East Kilbride	1 × Univac 1108	Research	Engineering

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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