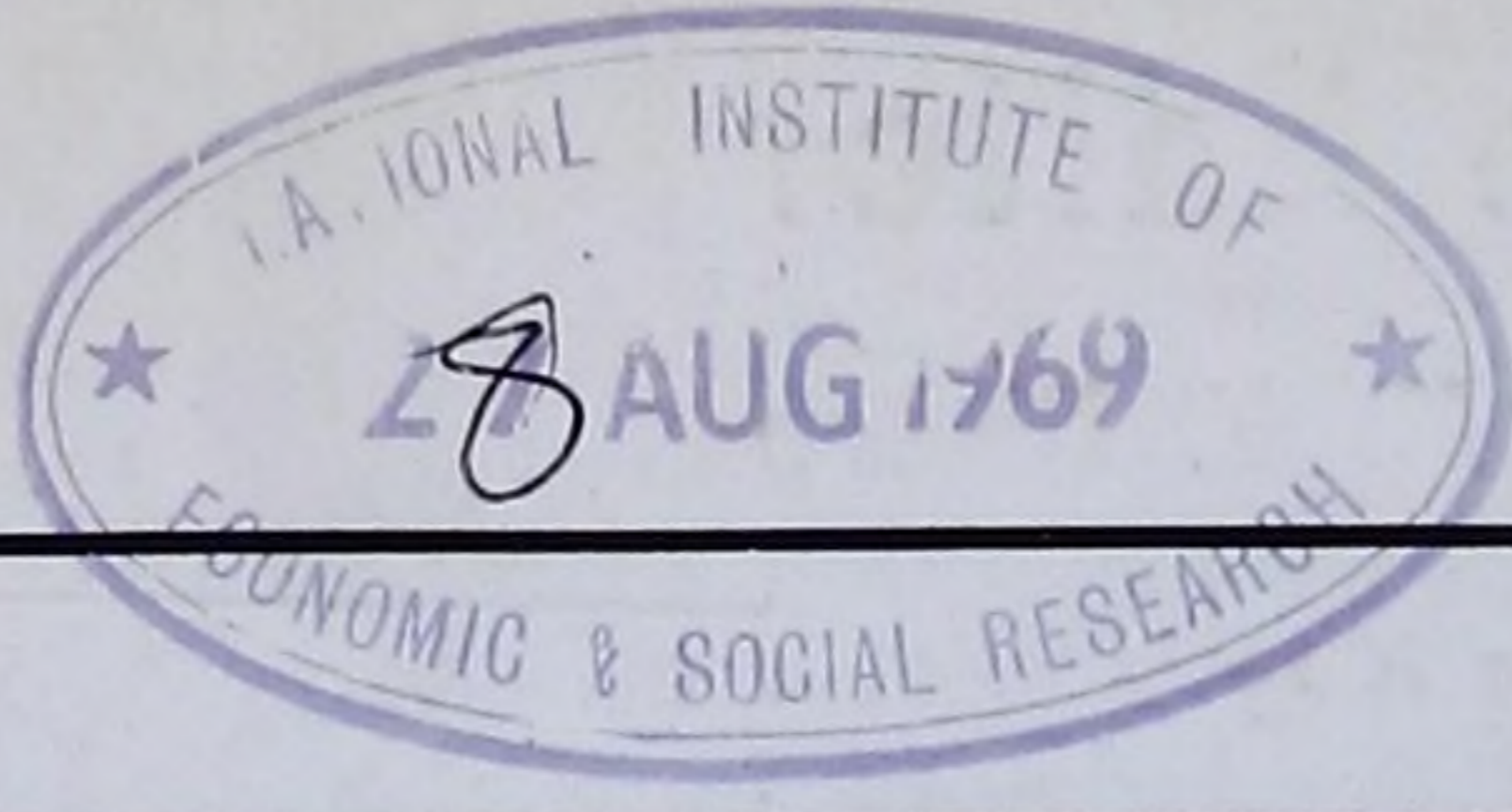


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STATISTICAL NEWS

Developments in British Official Statistics

I

Note by the Editor

H. E. Bishop

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

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

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

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

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CENTRAL
STATISTICAL
OFFICE

AUGUST 1969

Statistical News **No. 6**

**Developments
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LONDON

HER MAJESTY'S STATIONERY OFFICE

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British associations with the International Statistical Institute

Sir Harry Champion, *President of the International Statistical Institute, 1963-67*

The International Statistical Institute meets in London for its 37th Session from 3-11 September 1969 at the invitation of the Royal Statistical Society. The decision to establish an international institute was taken in London in 1885 at the time of the Jubilee celebrations of the Royal Statistical Society. Since then, British statisticians like to feel, they have played a leading part in the development of international co-operation among statisticians. In welcoming their colleagues from abroad to London in September 1969 they will feel the Institute is coming back for a reunion in its original home.

How it began

Three names stand out in the history both of the International Institute and the Royal Statistical Society - Adolphe Quetelet, the Prince Consort, Rawson Rawson. They had decisive roles in the events leading up to the forming of the International Institute.

Pride of place must go to the Belgian statistician Adolphe Quetelet. He exerted a great influence in the development of statistics, both in his own country and abroad - and particularly in England in the middle years of the 19th century. He attended the 1833 meeting in Cambridge of the Committee of the Statistical Section of the British Association for the Advancement of Science and out of this meeting came the suggestion from Quetelet to Babbage for the formation of a Statistical Society in London, eventually founded in March 1834, which later became the Royal Statistical Society. Quetelet is rightly remembered as one of the founders of the Society.

But the influence of Quetelet was felt beyond this. He had been a teacher of mathematics to Prince Albert, who later became the Prince Consort of Queen Victoria. The Prince Consort maintained and developed his own deep interest in scientific subjects and later acknowledged his debt to Quetelet for the introduction his teacher gave him to the principles of statistics as a science. The Prince became the first Patron and Honorary President of the Statistical Society, and here again history took a new turn.

At the instigation of the Prince Consort the Great Exhibition was held in London in 1851. The theme of the Exhibition was that representatives of the principal states of the world should meet together and should exchange their scientific knowledge and experience. Quetelet came to the Exhibition and took the opportunity of canvassing with foreign delegates the idea of holding an International Statistical Congress. As Babbage later recalled—

‘At length, the conviction of the importance of the value of statistical science becoming widely extended in other countries, M. Quetelet saw that a fit time had arrived for summoning a European Congress.’

Appropriately enough the first Congress was held in Brussels in 1853, and later other Congresses in other European capitals. In 1860 the Prince Consort was the President of the Congress held in London. He took part in its proceedings, and in a notable opening address which is still well worth reading said—

‘these International Congresses pave the way to an agreement between different Governments and nations to follow up these common inquiries, in a common spirit, by a common method and for a common end’.

The years which followed revealed the difficulties of obtaining effective co-operation between countries merely by holding Congresses every two or three years. There was a need for some kind of continuing organisation between sessions.

The next big step forward came in 1885, and it was then that the name of Sir Rawson W. Rawson came into the picture. In June 1885 the Jubilee celebrations of the Royal Statistical Society were held, and in the invitation to overseas guests one of the items proposed for discussion was—

‘To consider the possibility of establishing an International Statistical Association.’

The task of getting agreement of foreign and British delegates to this proposal for an international association was undertaken by Rawson Rawson, the President of the Royal Statistical Society for this Jubilee Session. He had been a Private Secretary to a Vice-President at the Board of Trade, had been Governor of the Bahamas (the main square in Nassau is Rawson Square), and had been in public service abroad in the colonies for 30

Sir Harry Champion was Director of the Central Statistical Office until his retirement in 1967.

years. He had, however, kept his interest in statistics over these years and maintained his connection with the Royal Statistical Society. He had been a member for 50 years, was one of its Honorary Secretaries in 1836 and the first editor of the Journal of the Society.

Detailed preparatory work on how this international association or institute might operate was carried out by Franz von Neumann-Spallart of Austria, and for this he is regarded as the father of the International Statistical Institute. The task of Rawson Rawson in helping to establish the Institute did not end with his duties at the 1885 Session. He became the first President of the Institute in 1885 and remained in office during its first formative years until 1899.

So under his Presidency the International Statistical Institute came into being as an independent scientific body with elected individual members from different countries. It had no official status and the object of the Institute as Rawson Rawson explained was 'to acquire and perfect statistical knowledge and to furnish information which may be useful to those Governments who may pay attention to its proceedings'.

All the problems in the early and later years of the Institute have been described in the excellent book *A History of the International Statistical Institute 1885-1960* written by J. W. Nixon, formerly of the British Ministry of Labour and later Chief Statistician of the International Labour Office.

Looking back

To present-day British statisticians who go to international meetings, maybe to New York, Geneva, Paris, Bangkok or elsewhere to discuss widely ranging topics, like the Standard International Trade Classification, the systems of national accounts and the use of computers in tabulating censuses of population, it must now seem unbelievable that in 1885, and indeed until the 1920's and 1930's, there was only one international statistical organisation to cope with international statistical matters. Most of the present specialised statistical international bodies owe their beginnings to discussions in and around sessions of the International Institute.

The first hiving off of some of the responsibilities of the Institute came with the setting up of the League of Nations after the First World War and the means thus provided for official Government statisticians to meet regularly and to agree on possible international standards for the collection and publication of official statistics. No longer were Governments only receiving recommendations from the Institute to which, as Rawson Rawson had said, 'they may or may not pay attention'. Their representatives were henceforward officially involved in making proposals for various

improvements in official statistics for adoption by Governments.

Various steps were taken in the 1920's and 1930's to evolve mutually satisfactory working arrangements between the Institute and the Committee of Statistical Experts of the League of Nations, and later with similar statistical committees being set up by international organisations like the International Labour Organisation.

When the Institute held its last Session in London in 1934 – at the time of the Centenary of the Royal Statistical Society – these arrangements were reaching completion. In different ways, prominent members of the Royal Statistical Society were involved in these arrangements. Josiah Stamp (later Lord Stamp and formerly of the Board of Inland Revenue) and Professor Bowley of the London School of Economics were concerned as members of the official Bureau of the Institute, and Alfred Flux of the Statistics Department of the Board of Trade as a member of the Committee of Statistical Experts of the League of Nations.

The second major shift in the work of the Institute came with a widening use of statistical techniques in new fields of enquiries such as demography, industrial research, social surveys, medical research and experimental sciences. The development of these could be helped by setting up special committees of members of the Institute, but later some of the work was taken over by new international organisations affiliated to the Institute, such as the Biometric Society, the International Union for the Scientific Study of Population (also meeting in London in September 1969) and the International Association for Research in Income and Wealth.

The present role of the Institute

The end of the second World War gave another opportunity for a fresh look at the past work of the Institute and to set new sights for its future developments. Its Statutes were revised and the objects of the Institute are now as follows –

'The International Statistical Institute is an autonomous society devoted to the development and improvement of statistical methods and their application throughout the world, in particular:

- a. by encouraging the international association of statisticians, the exchange among them of professional knowledge, and the growth among them of a collective interest in the advancement of such knowledge;
- b. by aiding in the establishment of such relations among statistical societies and other official and unofficial organizations having statistical interests as will further the international integration of statistics;

- c. by establishing and maintaining professorships, lectureships, and fellowships for advanced studies in statistics;
- d. by promoting the training of competent statisticians;
- e. by studying statistical theories, appraising statistical methods and practices, encouraging statistical research, and furthering the use of statistical methods in diverse subject-matter fields wherever useful;
- f. by promoting the use in all countries of the most appropriate statistical methods;
- g. by furthering international comparability of statistical data;
- h. by fostering public appreciation of sound statistical practice and the usefulness of statistical methods;

There are now three classes of individual members – honorary, ordinary and ex officio. Ordinary and honorary members are elected by name according to a carefully drafted procedure which at present limits the number to be elected from any one country to ensure its international character. Of 443 honorary and ordinary members in January 1969, 52 were from the United Kingdom. In addition there are ex officio members – usually the head of the central statistical office for each country – numbering about 100 and increasing. For the United Kingdom the ex officio members are the Director of the Central Statistical Office, the Directors of Statistics at the Board of Trade and the Department of Employment and Productivity and the Registrar General for England and Wales.

Apart from these members of the Institute, invitations are extended to other statisticians to attend sessions of the Institute.

British members of the Institute have in recent years helped the Institute to carry out the programmes of activities outlined in the revised Statutes. It would be unwise to try to list British members who have helped. Someone, or something important, might inadvertently be omitted, but mention may be made of some if only to illustrate the wide range of work the Institute is doing.

Sir Roy Allen, who was Treasurer of the Institute for a period, and Christopher Saunders have served on the Editorial Committee of the *Statistical Review* issued by the Institute. Maurice Kendall and William Buckland have prepared a multi-lingual *Dictionary of Statistical Terms* and J. W. Nixon a *Glossary of Terms in Official Statistics*. William Buckland has supervised the abstracting service *Statistical Theory and Methods Abstracts* as well as preparing, with R. A.

Fox, a *Bibliography of Basic Texts and Monographs on Statistical Methods*. British statisticians have lectured at the training centres of the Institute in Beirut and in Calcutta for training statisticians in those parts of the world and are taking part in the work of the Education Committee now examining university teaching of statistics in developing countries. Professor M. S. Bartlett has been concerned with a new affiliated Association for Statistics in the Physical Sciences. Assistance has also been given to the Institute in its work in the collection and publication of *International Statistics of Large Towns*, of interest to those concerned with problems of urban development.

British statisticians have also taken great interest in the scientific work of the Institute and in discussions of statistical techniques and their applications. The sessions of the Institute and its publications have provided the means by which new ideas and techniques cross frontiers of countries, frontiers of different subject fields and frontiers between Government and private organisations.

London 1969

And so to London in September 1969. There will again be heart-searching, as there was in 1885, whether the present system of international co-operation is good enough and should be improved. What new developments in techniques should be pushed? Is it all henceforward to be computers and data banks? Most thoughts will be on the future but, from the past, British statisticians will recall with gratitude the names of Rawson Rawson, the Prince Consort and Adolphe Quetelet for beginning what has proved for them such rewarding co-operation with statisticians all over the world.

Printing and publishing: a new inquiry

A. A. Sorrell, *Chief Statistician, Board of Trade*

The reorganization of short-period industrial statistics on which the Government Statistical Service is now engaged involves starting a number of new quarterly inquiries into sales and the substantial recasting of most of the existing series. (An outline of the reorganization was given in an article by J. Stafford in *Statistical News*, No. 1.) As a primary aim of this work is to provide a first-rate service to industry, whose needs are generally for figures of output in a good deal of detail, a substantial amount of consultation with trade associations and firms, as well as with other interests, is essential. Great care has to be taken to find out what industry wants in terms, for example, of the classification of output and the extent of detailed breakdown of it. At the same time it must be recognized that form-filling is a burden to firms, whose accounting arrangements are very varied, and equal care must be taken to see that the type and extent of information sought is what they can reasonably be expected to provide. It is not always fully appreciated what tasks are involved and how lengthy and thorough the preparatory work needs to be. Moreover, the sending out of the first set of forms for firms to complete is not, by far, the end of the road; there is then the problem of getting an adequate and timely response, estimating for missing items, assessing the real meaning of the returns on the items covered, and the analysis of the results. This article explains these processes by examining the quarterly inquiry into sales of the printing and publishing industry which was started by the Board of Trade at the beginning of this year ⁽¹⁾.

Background and origins

As there was virtually no detailed information about the industry's sales, the Board was starting almost from scratch. Short-period information was confined to summary quarterly figures of book publishers' receipts and of newspaper revenue with some product detail. Nothing at all was collected from the turnover of the general printing and publishing firms, who account for something like a half of the total turnover of

about £1,000 million.

There was thus a major gap in industrial statistics. This was of concern to the Government as there was no adequate measure of the output of the industry, needed for example for the index of industrial production. This concern was shared, and increasingly voiced, by the industry in which there was a growing demand for information for management and marketing purposes. When it was decided early in 1967 that steps should be taken to fill this gap, great importance was attached to full consultation with potential users of the figures to ensure that the needs of all users would be taken into account. For this purpose, and to bring together users and providers of the figures, an informal working party with representatives from trade associations, the National Economic Development Office and other Government Departments was set up in May 1967. The broad outline of the new inquiry was agreed and in the ensuing months numerous matters of detail were thrashed out in an extensive series of discussions between the Board and the individual sectors of the industry concerned.

Preparation of the inquiry

A primary object of the inquiry was that it should meet the essential requirements of industry as well as government. Both needed up-to-date figures on a comparable basis and it was agreed that figures should be collected quarterly in terms of value only. It became apparent, however, that there was a wide diversity in the information needed by government on the one hand and industry on the other and, indeed, by different sectors and interests within industry itself. Official requirements although real and pressing were relatively modest; summary figures for broad sections of industry would have been sufficient. Much greater detail, however, was needed if the inquiry was to be of real value to the industry. The paragraphs below outline some of the main problems that had to be resolved.

Coverage

One of the decisions that has to be made early in the setting up of a new statistical inquiry is how best its objectives can be met while at the same time limiting the burden on the firms concerned. Does the inquiry

(1) The inquiry covers the following Minimum List Headings of the 1968 Revision of the Standard Industrial Classification.

485 Printing, Publishing of Newspapers

486 Printing, Publishing of Periodicals

489 Other Printing, Publishing, Bookbinding, Engraving, etc.

need to include all firms (irrespective of size), can it be limited to firms above a certain size, or can some sampling scheme be devised which will give adequate results? As the new inquiry was to be a part of a new range of standardized and related short-period output inquiries designed to provide figures of sales in a fair amount of product detail there was no question of a sample inquiry. It was, however, practicable to exclude a great many of the smallest firms. As a high proportion of the total sales of the industry are by firms employing fewer than 25 persons, the normal cut-off point for the censuses of production, the results would clearly have been of more value if a lower cut-off point – say 10 employees – had been taken, or perhaps if all firms were included. Desirable as this would have been from a user point of view, it was clear that many of the smaller firms, particularly the small general printers, would have had real difficulties in providing the figures. Moreover, the numbers of small firms involved – some 6,000 employing fewer than 25, of which about 4,000 employed fewer than 10, compared with about 3,000 larger firms – would have added significantly to the already formidable difficulties of getting a viable inquiry working and to its processing costs. It was decided, therefore, to begin by excluding firms employing fewer than 25 people although the possibilities of lowering this limit will be considered in the light of experience when the inquiry is running smoothly.

An exception was, however, necessary in the case of book publishers, since in this section of the trade firms with very few employees can have a large turnover. Firms with fewer than 25 employees account in fact for a high proportion of total turnover. All book publishers, irrespective of size, had already been making summary quarterly returns for many years. It was decided, therefore, to include all but the very smallest book publishers in the inquiry.

Sales of products of this industry by establishments mainly engaged in other industries (the so called 'carry in') account for only a small proportion of the total sales of print and of published matter and it was decided not to include these sales initially. As other industries are brought into the new system these sales will be covered.

Reporting unit

It was essential that the reporting unit for the inquiry should be that adopted for the new system of industrial inquiries, that is, the 'establishment'. This is defined as a separate geographical production unit, but exceptionally it may have to be more widely defined in the light of firms' accounting arrangements⁽²⁾. The report-

(2) For further discussion of the definition of the establishment see the introduction to the *Standard Industrial Classification: Revised 1968*.

ing unit to be used in inquiries is important since it determines the precision of the industrial classification of employment, investment, etc. and of the regional analysis of the data.

The establishment as the reporting unit presented a particular problem in part of this industry where a fairly wide range of firms are engaged in both printing and publishing. In past censuses of production the majority of such integrated businesses had made a single return, regarding the two activities as representing a single 'establishment' rather than making a separate return for each. There was very strong pressure from the printing side of the industry for the Board to obtain separate returns so that the inquiry would provide figures of the total sales of print, as well as of sales of published matter. Those consulted believed that the firms concerned could split the figures as the two activities within a business were operated independently of each other. There were doubts, however, whether the accounting arrangements of many firms would, in fact, enable them to do this. Firstly the firms would have to provide data on the transfer of printed books, etc. to the publishing side of the business for the quarterly inquiry. Secondly they would, in due course, have to provide separate data on their other activities for the inquiries forming the integrated system of industrial statistics of which this inquiry was to be a part, for example annual figures of fixed investment, stocks, etc. To resolve the issue the Board wrote during 1968 to 42 of the largest integrated firms who had made combined returns to the 1963 census of production. Of these only 9 (accounting for a fifth of printer/publisher sales in 1963) said they would be able to make separate returns but a further 11 (accounting for a quarter) said that because of changes in their organization or functions they were now either printers or publishers only. This left 20 or more who said that it would not be possible to give separate returns.

The outcome was that the new inquiry would go some way towards providing the figures the printing industry strongly preferred. Further progress depends on whether the structure of the firms and their accounting arrangements develop in this direction. The British Federation of Master Printers is drawing the attention of those of its members concerned to the value of comprehensive statistics of print sales and urging them to provide separate figures.

Classification

A further major problem at the outset was to determine the most appropriate classification of the industry's products. Strong interest was expressed by industry in a main analysis by product type – e.g. books, advertising material, greeting cards – but with

each product classified by type of printing process, e.g. letterpress, litho, etc. It was agreed that cross-classification with this degree of detail, although desirable for some purposes, would place too great a burden on the majority of reporting firms: a choice between the two approaches had to be made. A process analysis would have maintained continuity with past censuses of production data, but for marketing purposes industry preferred a product breakdown (demand for individual products being more susceptible to short-term changes than processes) and this was the classification adopted. This greater interest in marketing data is an increasingly common feature in many industries.

Product detail

The next problem was to agree the product headings. The essential needs of the Government, as mentioned above, would have been met by relatively few headings. Different parts of the industry had different needs, but the interests of those concerned with marketing would have been ideally met only by a very extensive and detailed range of product headings. There was strong pressure for this by some of the associations and persons consulted. There were considerable doubts, however, as to the ability of many firms to analyse their sales in very fine detail without a great deal of inconvenience. Given that large parts of the industry had not previously had to make regular returns of their sales, that there was no generally accepted product classification in use by firms and that there was a very large number of small firms whose records were likely to be fairly rudimentary, the Board's view was that a more modest degree of detail was called for to begin with.

This was accepted (if rather reluctantly by some of those consulted) and after extensive consultations during the latter part of 1967 and early 1968 a set of headings was hammered out and then tested amongst their members by trade associations, particularly by the British Federation of Master Printers. The final list, even after pruning, still looked fairly formidable – over 100 headings – but given the diversity of the industry, which ranges from the ancillary process of typesetting, book, newspaper and periodical printing and publishing, greeting cards, diaries, etc. to general printing, it was not thought to be unduly so.

The round of consultations and discussions on the headings for this form had an interesting and useful by-product. The National Economic Development Office, who had taken a full part in these discussions, produced a booklet⁽³⁾ advising firms in the industry to

systematize and analyse their sales records to form a better basis for market analysis and consideration of selling policy. The booklet set out a recommended analysis of sales records in much greater detail than, but consistent with, the product headings on the quarterly form. A copy of the booklet was sent to all firms in the industry. Wide usage of this classification in their records would facilitate the collection of sales figures in the quarterly inquiry in more detail and thus make the results more useful to the industry. It would also make it more practicable to include in the inquiry some of the smaller firms initially excluded.

Export sales

In the general reorganization of short-period sales statistics, considerable attention is being paid to matching as far as possible the headings under which sales figures are collected from firms with those used by Customs and Excise in recording imports and exports. This would greatly increase the usefulness of both sets of figures and also avoid burdening firms with separate reporting of export sales. It is intended to free the quarterly forms for most industries of questions relating to export sales and to rely for the comparison of total sales of individual products or groups of products with the corresponding exports (and imports) on the figures produced by Customs and Excise. An exception was made in printing and publishing industry because a high proportion of the exports of certain products are by parcel post for which no commodity analysis is made in the overseas trade figures. This is particularly important for books, where about one-half of publishers' exports of approximately £56 million a year are by parcel post. Figures of publishers' total sales of books are being collected in the existing inquiry and as book publishers were concerned at the lack of information about the types of books exported it was decided that questions relating to export sales, in the same detail as those for total sales of published books, should be included on the form. It is less clear how important parcel post is as a channel for exporting other published and printed matter but summary headings for export sales were also included on the form.

Measurement of sales

The products of the printing and publishing industry, even when analysed in a fair amount of detail, are heterogeneous and for many of the headings finally agreed upon physical measure of sales (units, weight) had little meaning or use. It was decided, therefore, to collect only the value of sales. For this reason it was all the more important that a reliable measure of changes in the prices of the industry's products should be available so that changes in output in real terms

(3) *Look at your Sales* with a foreword by Sir Max Bemrose, past President of the B.F.M.P., issued by the Printing and Publishing E.D.C.

could be assessed. During the course of the discussions with industry about the new quarterly inquiry the opportunity was taken, with the help of trade associations and firms, to extend considerably the range of price quotations collected by the Price Statistics Section of the Board of Trade.

Compulsory inquiry

If the figures are to serve adequately the purpose for which the inquiry was designed, and if, in particular, the industry's needs for sales figures in a good deal of product detail are to be met, it is essential for all firms within the scope of the inquiry to make returns. This inquiry, therefore, like the quarterly sales inquiries for other industries that will form part of the new system of industrial statistics, has been carried out under the Statistics of Trade Act, 1947.

Launching the inquiry

The preparatory work for the new inquiry was completed by the late spring of 1968. With a major new inquiry of this type it is usually considered essential to warn the firms concerned well in advance of the sort of information that they will have to provide. Each of the establishments thought to be within the scope of the inquiry was sent a specimen copy of the questionnaire using the census of production register as a mailing list.

As it was not possible to reproduce and mail the specimen forms until well into July 1968, it was decided to start the inquiry in respect of the fourth quarter of the year. The specimen forms were thus mailed well before the beginning of the period and firms had the opportunity to arrange in advance for the required figures to be recorded. It is difficult to assess how important this factor is – and easy to take the cynical view that few firms will do much before they get the statutory form for completion. With such a formidable questionnaire, firms should be given adequate notice; this view was strongly urged by one of the major trade associations. The specimen forms were sent to some 3,500 firms.

A covering letter explained the purpose of the inquiry and stressed particularly the fact that one of its major aims was to provide the industry itself with the figures it needed. At about the same time many of the trade associations circularized their members, or included notes in their journals, supporting the inquiry and explaining the value of its results to the industry.

During the period after mailing the specimen forms there were a number of queries from firms and, inevitably, a number of complaints and protests. Reaction against the inquiry was, however, much less than might have been expected, particularly in view of

the length of the form and the very large number of small firms involved to whom the statistical detail was likely to be of modest direct value.

Nevertheless, it was expected that it would be likely to prove a lengthy and difficult process to get full and prompt returns in response to the inquiry and it was thought that it would be helpful to send with the first forms for completion further explanation and expressions of support from within the industry. For this purpose the forms were accompanied by a letter, signed jointly by the Director of Statistics and the Presidents of the two main trade associations stressing again the value of the inquiry to the industry and the fact that its setting up was a co-operative effort between the Government and industry. The forms were sent out on 1 January 1969. It thus took something over a year and a half from the start of discussions to the issue of the first forms. This delay has been inevitable in view of the extent and depth of the consultations needed.

Getting the returns in

The sooner statistics are available the more valuable they are. For this reason firms were asked to make their returns within 15 days.

It was expected that, by the nature of the inquiry, the response would be very slow in the early stages. With a quite new and detailed inquiry it takes many firms a long time – even after lengthy advance warning – to organize their records and extract the figures in the form needed. Also, of course, many firms are reluctant to take on the additional burden. These are problems common to almost all statistical inquiries. The size of the task in this case is indicated by the following outline of the pace of the response and the extent of the reminder action taken.

Within four weeks only 700 returns had been received. A first written reminder, to some 2,900 firms, was sent three weeks after the initial despatch and a second reminder (to 2,100) ten days later. The third, telephone reminder, after a further 10 days, involved nearly 1,800 calls. Some companies were telephoned two, three or even more times and in all nearly 3,000 calls were made. To supplement the routine reminder action and correspondence it was thought that a visiting programme, whilst drawing heavily on the time of senior staff, would be of value if the visiting officer was able to resolve companies' difficulties once and for all by giving advice on the completion of currently outstanding forms and future inquiry forms. This proved to be the case, and the majority of visits made to the medium and large companies in the industry were of mutual benefit.

Apart from the reminder action, there was a heavy

burden in the initial stages of answering queries from firms about the inquiry, questioning some of the returns and determining whether firms were within its scope. As well as forms, some 800 letters, for example, were received during the first three months following the issue of the forms; and some 700 incoming telephone queries. A significant load of work resulted from the inevitable imperfections of the original mailing list which was based on the 1963 census of production. Reminder action and correspondence established that some 1,000 firms were outside the scope of the inquiry because they were either too small, not trading or had gone out of existence.

By the middle of July, in spite of all the reminders, a number of the remaining firms, including some quite large ones, had still not reported. It was estimated that the employment of these firms represented about 5 per cent of the total employment of establishments asked to make returns. No adequate basis existed on which to make a sufficiently reliable allowance of the effect of non-response on individual headings – for some it could be fairly large – but in view of the interest in industry and the importance of the new information it seemed worthwhile to publish the aggregated returns received at that time. Figures for the fourth quarter 1968 were accordingly published, on a provisional basis, in the Business Monitor series on 31 July 1968.

The task of getting in the outstanding returns continues, and it is hoped progressively to speed up the publication of the results of subsequent inquiries.

Changes envisaged in the agricultural census for England and Wales

P. G. Horscroft, *Chief Executive Officer, Ministry of Agriculture, Fisheries and Food*

Since 1866, returns have been collected each year from the occupiers of land used for agriculture; and for many years there has been no major change in the general pattern of the agricultural census. It is a postal enquiry, confined to a simple record of areas and numbers, and does not call for any calculations or estimates in money terms. The resulting information on acreage of crops and numbers of livestock, of workers and of machines comprises the basic data on the development of British agriculture, and indicates what measures are needed to achieve the objectives of agricultural and food policy.

Until the introduction of automatic data processing, there was little to be done beyond sending out forms and reminders, getting the returns back and adding up the figures for various administrative areas. Only since 1963 has it been found possible to exhibit the changing structure of agriculture in terms of type and size of enterprise, using standard labour requirements as the common measure of different types of cropping and stocking.

This approach naturally led to two further proposals: that the threshold of agricultural activity which justifies the inclusion of a holding in the census should be measured in standard man-days⁽¹⁾ rather than acres of crops and grass, and that more information was needed on the actual labour force engaged in agriculture, including the farmers themselves.

Changes envisaged in the next two years are intended

- (a) to rationalize the coverage of the census;
- (b) to find out more about the total labour force;
- (c) to bring the information collected in England and Wales more into line with that already collected by Scotland and Northern Ireland;
- (d) to meet the needs of the World Census of Agriculture, 1970.

Some changes would in any case have been needed to satisfy the requirements of the decennial World Census, sponsored by the Food and Agriculture Organisation of the United Nations. The World

Census is of considerable importance as a basis for planning, especially in under-developed countries, and even in the more advanced regions it has led to considerable improvement and greater standardization in agricultural statistics. The European version of the programme was drawn up by the European Study Group on Food and Agricultural Statistics, which is responsible to F.A.O., the Economic Commission for Europe, and the Conference of European Statisticians. The programme provides for a common core of information which all participating countries should provide, together with additional items and tabulations which participants are asked to include if their circumstances permit.

For the 1960/61 World Census, special field and postal enquiries were necessary in England and Wales to obtain the obligatory information not already collected. Since then the Ministry of Agriculture's own statistics have become more comprehensive, and no such special enquiries are envisaged this time. There are in fact only five items on which no data have previously been collected except for the World Census. Three of these will be covered by 'once only' questions in quarterly sample censuses during 1970; the two most important (total area of holding and form of tenure) will in future be included in the June census.

The term *total area* has hitherto denoted the area under crops, grass and rough grazings. This does not agree with the World Census definition, and in future the June returns will include woodland and other land (under roads, buildings, etc.) the use of which is ancillary to the farming of the holding. Had this change been made in 1960, it would probably have brought an additional 600,000 acres into the census.

Questions on *tenure*, distinguishing the area of land owned and rented, will also become permanent features of the June returns. Such questions were discontinued in England and Wales (though not in Scotland) after 1922, and since then information on tenure has been obtained only in the National Farm Survey of 1941/43, which was confined to holdings of 5 acres or more, and in the last two World Censuses. The proportion of agricultural land owned by its occupier rose from

(1) A standard man-day is a measure of average labour usage. Thus, the work associated with one dairy cow is estimated to amount to 10 man-days a year; an acre of wheat needs 2 man-days, and so on.

18 per cent of the total in 1922 to 33 per cent in 1941/43, 38 per cent in 1950 and 49 per cent in 1960/61.

The agricultural labour force

The agricultural census has enumerated whole-time and part-time farm workers since 1921. A detailed age breakdown of regular whole-time workers was introduced in June 1967, and family workers were distinguished in the quarterly censuses from September 1967 onwards; but hitherto the labour questions have excluded the farmer himself, partners (other than junior working partners), directors and all office staff. From 1970 it is proposed to include those engaged in managerial, supervisory, secretarial or book-keeping activities, or in maintenance work on buildings, machinery, hedges, ditches, etc., or in marketing produce grown on the holding, and it is thereby hoped to obtain more accurate information on the numbers of self-employed persons in agriculture and horticulture. The exact form of the questions will depend on the outcome of a pilot survey, conducted to ascertain whether farmers encounter any difficulty with the new concepts.

The scope of the census

Since 1892, the agricultural returns have related to holdings of over one acre of land used for agriculture; but of the 300,000 such holdings in England and Wales, about one-sixth have very little agricultural activity. As from June 1968, some 47,000 holdings with under 10 acres of crops and grass, with no full-time labour and with cropping and stocking accounting for not more than 25 standard man-days have ceased to render returns. On the other hand, there is a substantial volume of agricultural output on holdings of one acre or less, at present omitted from the census, practising intensive forms of production, particularly in horticulture and pig and poultry farming. It is proposed to bring these holdings within the scope of the census as from 1970, and active steps are being taken to identify them. The net effect should be an increase in the proportion of total agricultural output and farm income which is covered by the census.

The changes will enable aggregate farming net income to be estimated for all holdings of more than 25 standard man-days. It is intended that this basis of estimation should be uniform for the United Kingdom, though this will not preclude Agricultural Departments from collecting information from holdings below the threshold for their own purposes.

Stratification of the quarterly sample censuses

At present all holdings are required to render two returns a year, one in June, the other in March, Septem-

ber or December. Each quarterly sample comprises all holdings (about 80,000, excluding the statistically insignificant holdings) in one-third of the parishes in England and Wales. It is hoped to reduce the sample size to about 30,000, without loss of information, by introducing stratification by farm type and size with appropriate sampling fractions. If experimental work in 1970 goes well, the occupiers of some 150,000 holdings will no longer need to render a second return from 1971 onwards.

On balance, impending developments will mean less rather than more form-filling. The booklet form of return introduced in June 1969 certainly has more questions, because of the need for more data on horticulture but the horticultural items are in a separate section and farmers without horticultural crops should find the form less formidable.

Agricultural statistics are just as accurate as farmers make them; and the need to retain the farmers' goodwill is always kept in mind. It is hoped that the 'new look' will prove acceptable to farmers individually and beneficial to farmers collectively, and indeed to the whole community which they and the Agricultural Departments serve.

Measuring self-sufficiency in food and agricultural products

A. H. J. Baines, *Chief Statistician* and L. J. Angel, *Senior Executive Officer, Ministry of Agriculture, Fisheries and Food*

About half of the United Kingdom's food requirements are home produced, or about two-thirds of the kinds that can be produced in our climate. The calculations underlying this apparently simple statement require a sequence of decisions on the methods and definitions to be adopted. This article gives indications of some of the varying approaches possible when attempting to measure the degree to which the United Kingdom is self-sufficient in food and agricultural products⁽¹⁾. The choices involved are mostly independent of one another, and the number of differing though closely related questions which can reasonably be asked and answered runs into three figures.

Coverage

Not all agricultural output is intended for food, and not all food is of agricultural origin. The question of self-sufficiency may relate to food for human consumption which is of agricultural origin, or may be widened in one direction to all agricultural produce, or in another to food of all origins. Both British and foreign fishing industries provide substantial contributions towards the nation's requirements of food and feedingstuffs.

Indigenous commodities

Whichever definition of coverage is adopted, the question of self-sufficiency may extend to all commodities or may be restricted to indigenous commodities, imports of which are in direct competition with home produced commodities of the same kind. The classification of imports into indigenous and non-indigenous raises conceptual problems. The principle which has been adopted here is that to qualify as indigenous a commodity must actually be produced in the United Kingdom on a commercially viable basis. If home production is not commercially viable, the product should be treated as non-indigenous. Items of limited

seasonality are treated as indigenous during those months when home supplies normally form a significant part (say 10 per cent) of the total supplies entering distribution.

This approach avoids the difficulty involved in attempting to assess the degree of substitutability between related products. Thus maize is, at least for the time being, classified as non-indigenous, in accordance with the principles of commercial viability and significant contribution, even though maize imported for animal feed is in competition with home grown coarse grains. Imports of sugar, on the other hand, are classified as indigenous, on the ground that, when refined, cane sugar and beet sugar are not merely related commodities but interchangeable. This does not imply that one could be freely substituted for the other; there are long-term commitments to overseas suppliers precluding the replacement of cane sugar by home produced sugar from beet.

The term 'indigenous' does not mean the same as 'temperate'. Hard wheat is a temperate product, but it is not grown commercially in the United Kingdom. Imported wheat has to be classified as indigenous or non-indigenous according to its country of origin, since hard wheat is not itemized in the *Trade Accounts*.

Although economic or technological changes may necessitate revisions in the definition of indigenous commodities, this is unlikely to happen frequently, and there is no such break in series during the period under review.

Treatment of exports

For any group of commodities which are imported but not exported, it would be possible to define self-sufficiency as the ratio of the gross UK output of those commodities to the sum of gross UK output and imports. In fact, a small but significant proportion of the output of home agriculture is exported, and some commodities such as raw sugar and tea may be imported

⁽¹⁾An article treating this topic in more detail appears in the August 1969 issue of *Economic Trends*.

for re-export after further processing. Alternative treatments of exports once again double the number of variations on the theme of self-sufficiency, since the question may relate either to the percentage of UK consumption which actually came from UK production, or to the percentage of self-sufficiency allowing exports to offset corresponding imports. 'Corresponding' has been interpreted almost but not quite as strictly as in defining indigenous imports; exceptionally, exports of barley have been set off against corresponding imports of feed maize, on the assumption that the latter would not have been needed if the barley had been retained for use in its country of origin.

Treatment of imported inputs

Home agriculture requires substantial imports of animal feedingstuffs, seed and store cattle, as well as other materials and fuel. The self-sufficiency calculation can either be gross, or net of all imported inputs, or (as is customary) net of imported feed, seed and store animals. It is, however, rather arbitrary to draw a line between these and other inputs no less necessary for agricultural production, including supplies of fuel, fertilizers and machinery. This line of enquiry has not been pursued in detail; it might provide the best set of measures of self-sufficiency for some purposes, but would take one far into the input-output field.

Prices and other units of measurement

All these calculations require a common unit which can be applied to all the commodities with which the enquiry is concerned. For obvious reasons, physical quantities do not provide such a common measure. Indeed, the only common measures applicable to agricultural products as a whole are in money terms. When the coverage is restricted to food, the energy value or nutrient content of the products can be evaluated, though there are as many such measures as there are nutrients capable of evaluation, and there appears to be no meaningful way of combining them into a single measure of nutritional value.

The choice of prices is restricted to those applicable at a well-defined point along the distribution chain where home and imported supplies retain their separate identities. In practice, this usually means the farm gate for home produced commodities and the ship's side for imports – or, more precisely, the point of first purchase, since both producers and importers may hold stocks elsewhere than on farms or in ships.

With this convention, a further choice has to be

made between the price paid by the first purchaser (the market price) and the price actually received by the producer (the market price *plus* deficiency payments) or the importer (market price *less* import duties).

Further, the price (whether at farm gate or equivalent, or at factor cost) may be current, or may relate to some other period. The choice of base period is to some extent arbitrary, and it happens that the single years 1958 and 1963 have been generally adopted for British economic series. For agricultural series, however, a three-year base period is customary and seems advisable, to even out the short-term variations in home supplies brought about by changing weather conditions.

The two examples of measurement in nutritional terms given below relate to energy value measured in (kilo-) calories and in grams of protein. It is usual to express these and other nutritional measures as averages per head per day. For energy value, this average is closely determined by human needs.

Proportion of UK food supplies derived from home agriculture and fisheries

It is not intended that all the possible series suggested above should be calculated and published *in extenso*; but some examples can be given, and further series are in course of preparation. Tables 1 and 2 give estimates of the proportion of UK food supplies (of agricultural or other origin) derived from home agriculture and fisheries, using both the value and the nutritional methods of measurement. As indicated above, it is not in general possible to distinguish between home produced and imported supplies at the point of final sale, so that, in self-sufficiency calculations, quantities have to be measured at a point much nearer the farm gate or ship's side. In Tables 1 and 2, this is the point of first purchase. For the value-based calculation, the quantities have been valued at current market prices, without adding deficiency payments or deducting import duties. The calculation was directed to UK food supplies, not to agricultural output as a whole; thus all home and imported supplies destined for any other use than consumption as food by human beings in the United Kingdom were excluded from the calculation. No deduction was made to take account of the dependence of home output on imported materials; but deductions have been made for the agricultural content of manufactured foods subsequently exported. Re-exports of food were deducted from food imports. The calculation was repeated for indigenous products using the conventions set out above.

TABLE 1

UK food supplies derived from home agriculture and fisheries valued at current market prices

Years July/June

	Value		Share from home supplies (1) per cent
	£ million	Index 1955/56=100	
All food			
1955/56	2,452	100	49.1
1962/63	2,754	112.3	51.6
1963/64	2,838	115.7	51.1
1964/65	2,940	119.9	51.3
1965/66	3,050	124.3	51.6
1966/67	3,091	126.1	52.1
1967/68	3,147	128.3	52.4
Indigenous food			
1955/56	1,875	100	64.1
1962/63	2,160	115.2	65.8
1963/64	2,237	119.3	64.8
1964/65	2,325	124.0	64.9
1965/66	2,401	128.1	65.5
1966/67	2,454	130.9	65.6
1967/68	2,474	131.9	66.7

(1) Supplies from the Channel Islands have been treated as imported.

Thus, over the past twelve years, total food supplies entering consumption in the United Kingdom, measured at the primary stage, increased in value by 28 per cent at current market prices; but within this total the value of home supplies rose by 37 per cent. The value of indigenous foods from all sources increased by 32 per cent over the same period, but imports of these foods rose by only 23 per cent (for non-indigenous foods, the increase was 17 per cent). By 1967/68 the share of UK consumption of indigenous foods met from home output had risen to almost exactly the two-thirds which has often been quoted.

If the calculation is made in terms of constant prices, with 1962/63–1964/65 as the base period, the percentages in 1967/68 are slightly reduced, to 51.7 for all foods and 65.7 for indigenous foods.

In Table 2 the quantities of food moving into consumption in the United Kingdom are expressed in terms of calories and grams of protein per head per day. The choice or unit of measurement affects the measure of self-sufficiency. In terms of energy value, the present share of home supplies appears to have halted at just over 42 per cent; in terms of protein content, the share is much higher, nearly 62 per cent, and is still rising, as it is in value terms.

Between 1962/63 and 1967/68 the average energy value of the diet per head per day fell by 3 per cent, mainly because of an increase in the proportion of children and old people in the population, but probably also because hard manual work is steadily giving way to sedentary occupations. Over the same period the population rose by 3 per cent, thus offsetting the decline in calories per head. Thus home and overseas producers were competing in a market which was almost completely inelastic in calorie terms, though not in terms of value or of those nutrients which are still moderately income-elastic.

TABLE 2

UK food supplies derived from home agriculture and fisheries

Energy value and protein content

Years July/June

	Total	Index 1955/56=100	Share from home supplies per cent
Calories per head per day			
1955/56	3,170	100	39.2
1962/63	3,175	100.2	41.1
1963/64	3,165	99.8	41.2
1964/65	3,145	99.2	42.2
1965/66	3,140	99.1	42.4
1966/67	3,110	98.1	42.4
1967/68	3,080	97.2	42.4
Protein per head per day			
1955/56	82.8	100	55.7
1962/63	86.8	104.8	59.7
1963/64	87.0	105.1	60.2
1964/65	86.9	105.0	60.8
1965/66	86.6	104.6	61.1
1966/67	86.0	103.9	61.6
1967/68	85.9	103.7	61.7

Equivalent farm gate value of imported indigenous commodities

So far, the ship's side has been equated with the farm gate; but in fact the ship's side is farther down the distributive chain. The value of imports includes both the agricultural content and the value added subsequently. Table 1 shows that in 1967/68 the value at market prices of indigenous foods moving into consumption in the United Kingdom was £2,474 million, of which £1,650 million was produced at home and £824 million was imported. (For all imports of indigenous food, feedingstuffs and live animals the total was £941 million, still below the figure of £1,000 million, which is often quoted in this context.)

The value at market prices of imported indigenous foods moving into consumption in 1967/68 was £824 million, measured at a primary stage (the point of first sale). To pass from this to the actual cost of importing indigenous foods in that year, it is necessary to add the cost during the year of the change in value of stocks held by importers (£17 million) and also the cost of imports used for the manufacture of food for export (£8 million), but to deduct the import duties (£18 million) and the Sugar Board levies (£18 million) giving £813 million. This total can then be subdivided into £443 million spent on foods imported in manufactured and semi-manufactured form, and £370 million on raw products. It is not possible however to provide an accurate estimate of the value added by overseas manufacturers but it is estimated that freight and insurance charges included in the total of £813 million amounted to about £70 million, of which some £37 million was for British shipping.

Seasonal adjustment of economic time-series

R. L. Brown, *Chief Statistician, Central Statistical Office*

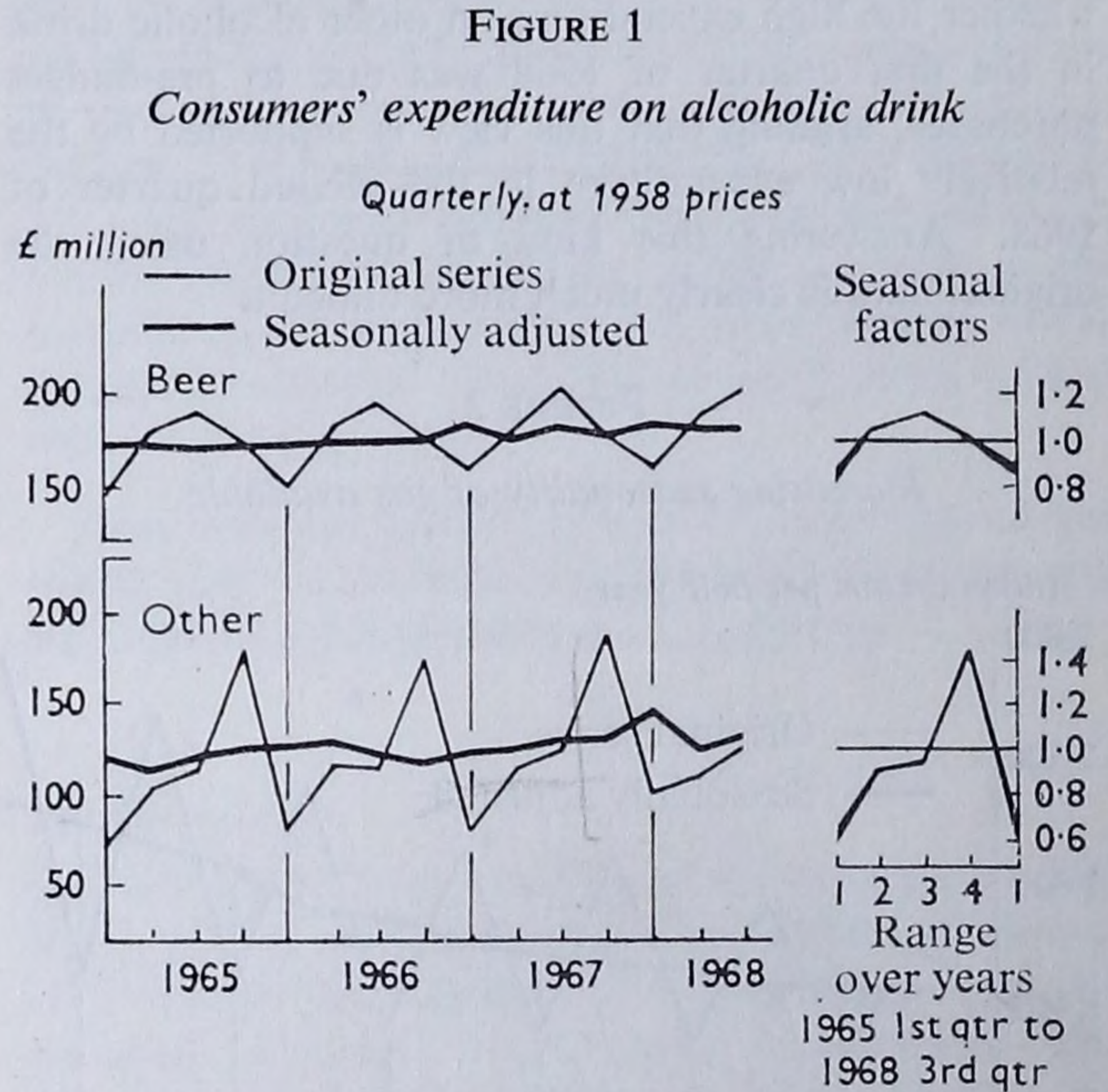
Much economic information becomes available at regular intervals of time, for example the daily takings of a dairy or the aggregated monthly series for dairy products. These time-series often have a seasonal pattern and the interpretation of their movements is often helped if the normal seasonal fluctuations are removed. Various procedures have been developed for effecting this seasonal adjustment. This article does not aim to discuss the technical statistical content of these procedures. Instead, a few simple examples are given to illustrate what seasonal adjustment is and what it is not. It is well-known that a seasonally adjusted series does not give directly the trend of the series. It is less obvious that a seasonally adjusted series can be freed from the normal seasonal fluctuations, but cannot (or at most, can only partly) be freed from newly developing seasonal factors.

Components of a time-series

The detailed up and down movements of a time-series can be resolved into the following components.

- (i) trend This is a long-term movement. In some cases it is a steady growth; with other series the trend may move downwards as well as upwards.
- (ii) seasonal fluctuations These deviations from the trend generally occur at the same period in each year.
- (iii) cyclical movements The best known example is the business cycle in economic and industrial series: the period is generally four to five years.
- (iv) irregular variations These are the chance variations arising from numerous causes which are not individually identified.
- (v) extreme movements These have immediately identifiable causes, for example, floods, severe winter weather or strikes, and can therefore be distinguished from the much smaller irregular variations.

Seasonal adjustment means removing (ii), thus leaving a seasonally adjusted series consisting of the remaining components, that is the underlying trend,



Source: *Monthly Digest of Statistics*, Nov. 1967 and Feb. 1969

the cyclical movements, the irregular variations and any extreme movements that may have occurred.

We may note here two clues on how seasonal adjustment may be effected. Firstly the seasonal fluctuations have a known period, namely a year; and secondly the pattern of normal seasonal fluctuations must be found from past experience, i.e. it must be estimated over a number of past years.

Two examples of seasonal fluctuations

Many published series are given in original unadjusted and in seasonally adjusted form. This is because neither is more correct than the other. Each has its uses.

For illustrative purposes we take two series which show quite different patterns. Expenditure on beer and other alcoholic drink is low in the first quarter of the year. Expenditure on beer is high in the third quarter, whilst that on other alcoholic drink is high in the fourth quarter. The reasons are obvious; more beer is drunk in the summer whereas, for the other alcoholic drinks, more is taken in the winter (around Christmas). This may be seen from Figure 1.

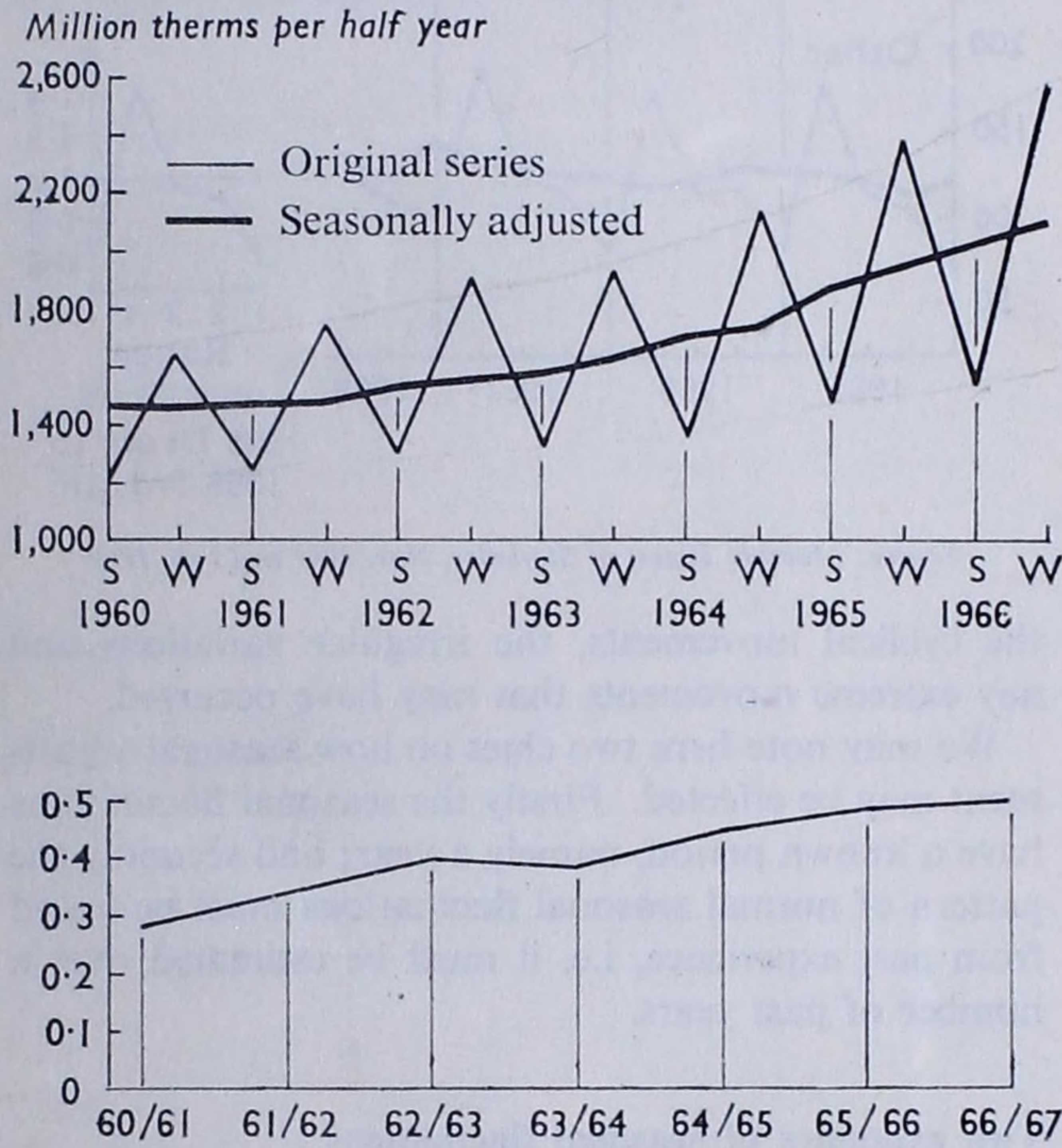
The normal seasonal fluctuations are summarised in

the form of seasonal factors, estimated for each quarter from past data. The seasonal adjustment is effected by dividing the original data by the appropriate seasonal factor. The pattern of seasonal factors, shown on the right-hand of Figure 1, does not vary much from 1965 to 1968.

The seasonally adjusted data, shown on the left-hand of the figure, are much easier to interpret than the original data. For example, it could be asked whether the high expenditure on other alcoholic drink in the first quarter of 1968 was due to pre-budget purchases, arguing that this view is supported by the relatively low expenditure in the second quarter of 1968. Answering this kind of question using the original data is clearly much more difficult.

FIGURE 2

Increasing seasonality of gas available



Ordinate: original (winter–summer values) divided by mean of seasonally adjusted values for each year

Source: Ministry of Power Statistical Digest, 1967, Table 105

Notice that neither of the two seasonally adjusted series in Figure 1 is a smooth curve such as would be expected for the trend. The small fluctuations from quarter to quarter show the irregular variations. The series as plotted are not long enough to show any cyclical movements that may be present. And for other alcoholic drink there is the unusually large fluctuation or extreme movement in the first quarter of 1968. In

order to prevent such an extreme value from distorting the normal seasonal fluctuations, there are several ways of discounting it, depending on the seasonal adjustment procedure that is used.

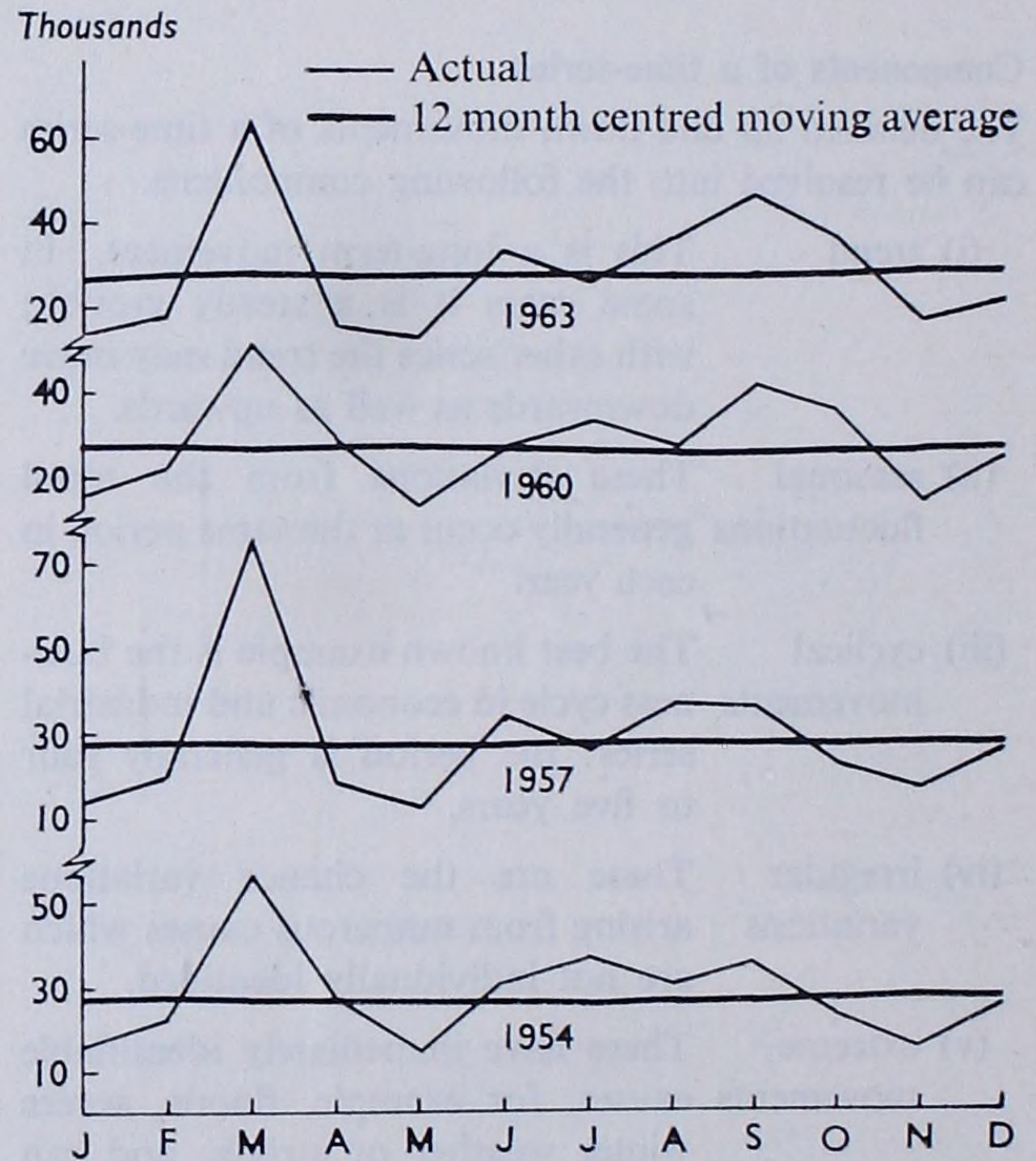
Changing seasonality

It is customary to estimate seasonal factors afresh each year. With some series the factors may show a changing seasonality over time. Figure 2 shows this occurrence for the 'gas available' series. The upper graph gives the original series and the seasonally adjusted series. (Here account has also been taken of the number of working days and of the deviations of air temperature in each period from the average for that period; see reference 3a for further details.)

The lower graph illustrates in a simplified manner the increase in the seasonal fluctuations that has taken place in the last few years⁽¹⁾. The ordinate is the ratio of the excess of the original winter availability over the preceding summer to the mean of the seasonally adjusted winter and summer values. From 1960/1 to 1966/7, this ratio has nearly doubled. This increase is attributed to the increasing use of gas for space heating.

FIGURE 3

Monthly incidence of marriage – England and Wales



Source: G.R.O. Statistical Review, 1966, Part II, Table N.1

(1) Since the seasonal adjustment of this series is effected by dividing the original series by the seasonal factors, this means that the seasonal fluctuations are increasing more than in proportion to the trend of the series.

The above change in seasonality is rather simple in that the fluctuation from summer to winter has increased in recent years. With other series the change in the pattern may be more complex. A simple and well known example is the seasonal pattern of marriages. Figure 3 shows the monthly incidence of marriage, 1954 to 1963, the heavy line being the trend which is nearly constant. The series is not seasonally adjusted, but the change in the seasonal pattern over time is clear; e.g. for the years shown, the highest figure is in March and this is greatest in 1957; the October figure moves steadily from below the trend in 1954 to above it in 1963.

We can discuss now the problem presented by newly developing seasonal factors. Consider the series for other alcoholic drink. If the high consumers' expenditure in the first quarter of 1968 were continued into the early 1970's, this would become a normal seasonal fluctuation and would be removed from the series during seasonal adjustment. Again, if the space heating load served by gas ceased to increase year by year, the relative summer to winter fluctuations would settle to a steady value.

The estimation of changing seasonality is bound up with the occurrence of extreme values and other matters such as the number of years over which normal seasonal fluctuations are estimated.

Some technical points

Considerable work has been done on seasonal adjustment procedures in statistical offices in many countries. This is not the place to report on the seasonal adjustment procedures that have been developed, but a few of the issues may be mentioned.

It is not difficult to see that some method of averaging the original data could be used to estimate the trend and cycle of a time-series. A moving average is used so as to follow the movements of the trend and cycle.

As said already, the presence of extreme values has to be allowed for so as not to disturb the estimation of the normal seasonal factors.

All of this would be very difficult to do were it not that the period of seasonal fluctuations is known in advance. Generally, it is a year. Given this information, several procedures have been developed and thoroughly tested. This is not to say that further study would not be profitable; there is room for marginal improvements and, because of the great importance of seasonally adjusted series in the interpretation of

movements of the economy, researches are currently under way in the Central Statistical Office and several Government Departments.

In watching the recent movements of a series, it is natural to look at the seasonally adjusted series and particularly at the quarter to quarter changes. This may suffice. But if the recent movement of the trend and cycle is what is of interest, it has to be remembered that the seasonally adjusted series includes the irregular variations and extreme movements of the original series, so that small quarter to quarter changes may be misleading. It is necessary to look at the run of the figures for a few successive quarters. Another approach is to reduce the relative magnitude of the influence of the irregular variation by taking a moving average of the seasonally adjusted series (or by using some similar method of smoothing).

Thus the observation made at the beginning of this article that a seasonally adjusted series does not give the trend is a simple question of definition.

Balance of risks

We come now to the meaning of the adjective normal in the phrase normal seasonal fluctuations. If seasonality were constant from year to year, there would be no great difficulty. If seasonality is changing, there are two possibilities. Someone might venture to identify a sudden change on *a priori* grounds: this hardly seems likely to be possible very often. An example relating to new car registrations is described elsewhere in this issue (reference 3 d). Such occasions are rare and mostly we have to assume that the seasonality is changing slowly and, by updating each year the base or run of years over which the seasonal fluctuations are estimated, to incorporate these slow changes progressively in the estimation. If the base contains many years, new seasonal factors would necessarily take several years to be included fully. On the other hand, too short a base would result in estimates having erratic properties. In balancing one risk against the other there is a further complication due to the presence of extreme values. The first occurrence of a new persistent seasonal factor may be judged statistically as an extreme value. As said already, at that moment in time the fact that the factor will turn out to be persistent is hardly ever known and it is preferable to discount this extreme so as not to distort the normal seasonal fluctuations. It is only when the same factor has appeared a few times that it can be incorporated in the seasonal adjustment.

When seasonality is changing, an effort can be made to project the seasonal factors into the future. But it is

inescapable that an optimal estimate of the seasonal factors for the current year cannot be made until a few years later. This is why small revisions are made from time to time in certain of the published seasonally adjusted series.

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2. The X-11 variant of the Census Method II seasonal adjustment program
Bureau of Census Technical Paper No. 15
J. Shiskin, A. H. Young, J. C. Musgrave
Published U.S. Bureau of Census, Revised Feb. 1967
(The latest version of the well known Census Method II used in many statistical offices).
3. As examples of other methods currently used, see:
 - (a) *Ministry of Power Statistical Digest, 1967, p. 28*
 - (b) *Ministry of Labour Gazette, Sept. 1965, pp. 382, 383.*
 - (c) Moving seasonal adjustment of economic time series
J. P. Burman, *Journal of the Royal Statistical Society, Series A, vol. 128, part 4, pp. 534-558.*
 - (d) Seasonal adjustment of new registrations of cars
(this issue of *Statistical News*, page 6.25)

Notes on current developments

SOCIAL CONDITIONS

Taxes and social security contributions: international comparisons

In an article published in the May 1969 issue of *Economic Trends* the Central Statistical Office gave a comparison of taxation in fourteen of the world's leading industrial countries. Tables (based on international returns made to and published by the OECD) show for each country total taxes and social security contributions as a percentage of gross national product in the years 1965 to 1967, and also the composition in 1967 of each total by type of tax. The article outlines the definitions used in calculating the figures and notes some of the problems involved in their calculation and interpretation. Similar comparisons have previously been given in answers to Parliamentary Questions.

Pensions paid abroad

Widows' benefits and retirement pensions

A person who lives outside Great Britain is not disqualified from receiving widow's benefit or retirement pension under the National Insurance Acts but the rate of benefit payable may be restricted to that for which the beneficiary was qualified when last resident in this country.

The method of payment varies according to the country involved and the intended length of absence. In some countries Overseas Paying Agents pay benefit usually by cheque at monthly intervals; elsewhere the Department's Overseas Group at the Central Office, Newcastle-upon-Tyne pays quarterly, usually in arrears. When the absence is temporary the beneficiary may let his benefits accumulate provided the absence is not expected to exceed two years; arrears will be paid on return to Great Britain.

Because of restrictions imposed by the Exchange Control Act, benefits cannot be paid in certain countries unless the beneficiary is permanently resident there. If he is not permanently resident he may either leave it to accumulate, if the absence is not expected to exceed two years, or have it paid quarterly in arrear to an agent or to his bank in Great Britain.

At 31 December 1968 there were about 102,000 retirement pensions and 12,000 widows' benefits being paid to persons overseas. The number has almost doubled since 1961 when 52,000 retirement pensions and 8,000 widows' benefits were being paid to persons overseas. The majority are paid to persons living in Australia (27,000 retirement pensions and 3,600 widows' benefits), Canada (13,000 retirement pensions, 1,700 widows' benefits), U.S.A. (10,000 retirement pensions and 1,400 widows' benefits), New Zealand (10,000 retirement pensions and 1,000 widows' benefits) and Ireland (13,500 retirement pensions and 1,500 widows' benefits).

A much smaller number of other benefits are paid abroad, such as industrial disablement and death benefit (2,900 in 1968), sickness benefit (about 1,700 in 1967), industrial injury benefit (300 in 1967) and maternity benefit (12,600 in 1967).

War pensions

War pensions for disablement or death are generally payable irrespective of the country in which the pensioner lives. The Department of Health and Social Security is responsible for the provision of medical treatment, appliances and invalid vehicles required because of their pensioned disablement by war pensioners living outside Great Britain.

The Department has offices in Northern Ireland, in Eire and in Ottawa. The latter maintains contact with United Kingdom war pensioners living in Canada and the USA. In Australia the interests of pensioners are looked after by the Repatriation Commission and in New Zealand by the Department of Social Security; the Commissioner of Pensions acts as the Department's agents in South Africa. Elsewhere appropriate government agencies act on behalf of the United Kingdom.

At the end of 1968 there were some 32,000 pensioners living elsewhere than in the British Isles. Of these about 24,000 were disablement pensioners, about 6,000 widows and the remainder other dependents including orphans. The numbers have, of course, fallen steadily over the past 20 years.

Of the total number in payment at the end of 1968 about 8,600 were to persons living in Australia, 6,100

persons living in Canada, 6,100 to persons living in the Irish Republic, 3,200 to persons living in the USA and 1,800 to persons living in New Zealand.

Figures for previous years are available from the Department of Health and Social Security.

National insurance: registrants arriving from abroad

Broadly speaking, all persons who are over school leaving age and resident in Great Britain, except certain non-employed married women, are compulsorily insurable under the National Insurance Act, which provides benefit for sickness, unemployment, maternity, widowhood, retirement and death, in one of three classes: Class 1 – employed persons, insured for all benefits; Class 2 – self-employed persons insured for all benefits except unemployment benefit; Class 3 – non-employed persons insured for all benefits except unemployment, sickness and maternity allowance. Most of these employed persons are also insurable under the National Insurance (Industrial Injuries) Act which provides benefits for incapacity, disablement or death caused by industrial accidents or prescribed industrial diseases. Employed married women, or widows in receipt of widow's benefit, may choose not to pay the main national insurance contributions but they have to be insured for industrial injuries.

The universal application of the National Insurance Acts to persons in Great Britain is modified by a residence test for a person, regardless of nationality, who arrives from abroad and is not already insured. Generally, such a person is not required to become insured until he has been resident for 26 weeks, unless he starts work as an employed person or notifies that he wishes the residence condition to be waived.

In certain circumstances a person insured under the Acts may maintain that insurance while abroad. Also there are many reciprocal agreements with other countries which determine how insurance in Great Britain and in those other countries shall be treated for people who move between them.

Anyone becoming insurable under the Great Britain Acts usually applies for a national insurance card. Among the questions on the application form, which is used either for tracing earlier insurance or setting up new insurance, are some which ask about the last address overseas and insurance in any other country. This information may be important in considering the effect of reciprocal agreements.

Registration for insurance normally takes place at a local office and the application forms are then sent to a central office. Since 1957 forms used by persons arriving from abroad have been analysed according to the last country of residence. The following table gives

a broad analysis for 1968. More detailed analyses are available and also figures for previous years.

Persons arriving from overseas and applying for National Insurance cards 1968

	<i>Registra- tions</i>	<i>Re-regis- trations</i>	<i>Total</i>
British Colonial Territories, Protectorates, etc.	4,212	2,081	6,293
Independent Commonwealth countries			
Australia, Canada and New Zealand	16,213	17,280	33,493
Others	49,006	19,863	68,869
Foreign countries	52,660	23,074	75,734
Irish Republic	30,929	13,351	44,280
Channel Isles	915	4,121	5,036
Total	153,935	79,770	233,705

These statistics are not, of course, comparable to those from other sources and cannot, for example, be matched with statistics about immigrants provided by the Home Office. Students over age 18 who stay for less than six months and do not have any employment in that time will not be known to the Department of Health and Social Security. Although, legally, all men and unmarried women immigrants should register when they have been in this country for six months there is no practical way of enforcing this. The figures are based solely on last address overseas and are not related to nationality or ethnic origin. The analysis is made according to the month in which the application form is received in the Department's central office and not according to the month of entry into Great Britain.

Further information can be obtained from Statistics Branch, Department of Health and Social Security, 1-5 Adam St., London, WC2.

LEISURE AND RECREATION

Countryside Commission

The 1968 Countryside Act provides the Commission with enabling legislation for a wide variety of research and co-ordination work on countryside recreation, and an important part of the current programme is concerned with studies involving statistics.

The Commission has become increasingly aware of the lack of any regular collection of standardised outdoor recreation data on which reliable forecasts of future conditions can be based. Moreover, although a great variety of information is being collected in numerous countryside recreation surveys, it shows little comparability, and is often of doubtful validity

because of inaccuracies in the choice and use of research methods.

The Commission are attempting in a number of ways to provide some solution to these problems, by making widely available the information that exists, and by suggesting improvements to the methods by which it is collected and classified.

A Countryside Recreation Research Advisory Group (CRRAG) has been established to improve the co-ordination of research in the field of outdoor recreation in the countryside, particularly at central government level. Permanent representatives attend from the British Waterways Board, Forestry Commission, British Travel Association, Nature Conservancy, Sports Council, Water Resources Board and Countryside Commission (who service the group) while some 20 other organisations, representing local government and university research have 'corresponding membership'. A major object of CRRAG has been the provision of an efficient research information service. To this end, the Countryside Commission, on behalf of the group, produces *Recreation News*, a monthly technical bulletin giving news of current projects, conferences and literature, which is circulated to those active in recreation planning and research. With the help of CRRAG and many other organisations, the Commission has compiled a second *Research Register* listing details of nearly 200 studies on countryside recreation and conservation. A *Data Digest* of useful national and, where available, regional statistics relating to outdoor recreation resources and activities has been prepared, and it is hoped that both the *Register* and *Digest* can be revised annually.

Recent work of CRRAG has included other studies designed to improve the quality and usefulness of the stock of statistical information on outdoor recreation. Recommendations have been submitted to the Central Statistical Office, who are considering the standard classifications used in traffic and transport surveys, on the modifications necessary to improve their value for providing information on leisure travel. A list of suggested standard definitions of recreation terms is in preparation, and work is progressing on an advisory manual of recreation survey techniques which will include recommendations on questionnaire design for recreation studies.

Through further work of this kind, and increasing liaison with all the many organisations involved, the Commission will become better equipped to fulfil its function as 'central . . . clearing house on countryside matters'.

Copies of the publications referred to above are available from the Countryside Commission, 1 Cambridge Gate, Regent's Park, London, NW1.

EDUCATION

*The impact of Robbins

An appreciation of the development of full-time higher education in Great Britain in the period 1961 to 1967 is contained in *The Impact of Robbins* by Richard Layard, John King and Claus Moser of the Higher Education Research Unit of the London School of Economics. It was published by Penguin Books in May 1969, price six shillings. Two of the authors had previously been engaged in the preparation of the statistical material in the Robbins Report (*Report of the Committee on Higher Education, 1963* (HMSO) Cmd. 2154) and the new Penguin Education Special is in the nature of a post-mortem on the developments since then up to the present time. It compares the achieved growth of higher education with what the Robbins Committee had recommended, presenting the material both in text and tables. In particular the book notes the relatively greater expansion of colleges of education and advanced further education than of universities. In a brief final chapter 'The future', the authors give their own rough estimate of the requirements for places in higher education in 1980-81, based on the assumptions in the Robbins Report in conjunction with the Department of Education and Science (1966) projection of the output of young people with GCE 'A' level qualifications; but they go on to express the hope that the government itself will produce and publish regular plans for a period of ten years ahead.

Pupils and teachers in schools

Statistics of Education 1968, Volume 1, Schools, was expected to be published in August 1969. It contains statistics of pupils and teachers in schools in England and Wales in January 1968. The main trends observed during recent years are shown to have continued; the school roll passed 8 million matched by a further increase in teaching strength; the number of comprehensive schools increased during the year by nearly a half to 745; and the continued increase in voluntary staying-on at schools beyond the statutory leaving age produced larger sixth forms. There were over 220,000 immigrant children in maintained schools, 36,000 more than a year previously and representing between 2½ and 3 per cent of all pupils.

A revision of the projections of the school population has given rather lower future estimates than hitherto for the compulsory school age groups but substantially increased figures in the higher age groups, notably at ages 17 and 18 and particularly for girls. The reduced

*Indicates that the contribution refers to work outside the Government service but is included because of its relevance to Government statistical work.

birthrate figures supplied by the Government Actuary's Department are largely responsible for the decreased numbers in the lower ages. The increased numbers in the higher ages are the result of a reassessment of the accelerating trend in voluntary staying-on at school. The net results of these adjustments give a total school population of 10.2 million in 1980 rising to 11.6 million in 1990, estimates that are respectively 0.3 million and 0.2 million less than previously published figures.

A new table gives the number of pupils in maintained primary and secondary schools analysed by age as at 1 September. The way in which a school organises its pupils into classes is usually related to the fact that the pupils who move from maintained primary schools to secondary schools at one time are those born in the period September of year X to August of year $(X+1)$. This makes age calculated at 1 September a significant basis for measuring pupils within the school system. On the other hand analysis by age at the beginning of January has importance in linking analyses of school pupils with other educational and economic data, and it is the basis of the main age analyses in the volume.

MANPOWER AND EARNINGS

New survey of earnings

Further results of the new type of survey of the earnings of employees in Great Britain (*Statistical News*, pages 1.23 and 5.26) conducted by the Department of Employment and Productivity in September 1968 have been published in recent issues of the *Employment & Productivity Gazette*. As already reported, the first instalment of results was published in the May issue, namely distributions of weekly earnings by occupation, age and region. The June issue gave distributions of weekly earnings of full-time adults, by industry group, separately for manual and non-manual workers and for men and women. Similar information was given for workers whose pay was affected by major national collective agreements and/or statutory wage orders. Subsequent issues gave the make-up of gross earnings in terms of basic pay, overtime, bonuses and other additions; the numbers who lost pay during the pay-period by reasons such as short-time working, sickness and other absences; the numbers for whom the employer provided free accommodation and/or board, the numbers who received tips or gratuities in addition to pay, and those whose pay was affected by factors such as mental or physical handicap or short experience; the distribution of hourly earnings and the relationship between earnings and hours worked.

This survey has provided much information not otherwise available. A decision will be taken shortly

on whether another survey of this new kind should be undertaken in 1970.

Employment census

Arrangements are being made by the Department of Employment and Productivity for a pilot survey to test the methods which are proposed for a full census of employment in April 1970 (*Statistical News*, page 5.24). The Finance Act 1969 enables the Inland Revenue to furnish the Department with names and addresses of P.A.Y.E. schemes for use in issuing the census forms.

Computers in offices

The Manpower Research Unit of the Department of Employment and Productivity is making a new survey of the effects of computers on office employment. This research has been requested by a number of firms and other authorities, and will update the Unit's 1965 report, published under the title, *Manpower Studies No. 4: Computers in Offices*. The survey has been designed to study the effects of computers on numbers of office workers, the nature of their work and problems of recruitment and training. It is concerned with staff on work taken over by computers as well as those needed to run the computer systems. As in the previous study, forecasts will be made of the numbers of computers to be installed and the manpower changes expected over the next five to ten years.

Computers in service bureaux, those on non-office work and very small (desk) machines are, as previously, being excluded from detailed study, but it is hoped this time to ascertain their numbers and their broad effects on manpower.

Questionnaires have been sent to all known users of computers in offices and to those who have machines on order – some 2,000 organisations in all. Different forms have been designed for installations set up before 1 January 1967 and the later ones. Visits are also being made to computer installations, machine manufacturers, government departments, professional institutions, etc.

The methods of forecasting will be based as before on projection of past trends and a close objective study of views and events from the questionnaires and visits in the field. Initial investigation shows that the forecasts made in the earlier study of the rate of setting-up new computer installations between 1964 and the present time were reasonably accurate. It was forecast that at the end of 1968 there would be at least 2,080 computers installed in offices. The number in fact turns out to be about 2,250. (Both figures exclude service bureaux machines and desk computers.) A full

report on the survey is expected to be published in the second half of 1970.

International comparisons of earnings of manual workers

A first article giving comparative statistics of average hourly earnings of manual workers in manufacturing and construction industries in the United Kingdom and the six countries in the European Economic Community was published in the *Employment & Productivity Gazette* in September 1968. For this purpose, the figures for the United Kingdom obtained in the six-monthly enquiries were converted from the United Kingdom Standard Industrial Classification to the EEC Industrial Classification (NICE). The article was prepared with the assistance of the Statistical Office of the EEC. The figures related to April and October in 1964 to 1966 and to April 1967. More recent figures on the same basis will be published regularly by the Department of Employment and Productivity as they become available.

PRODUCTION

Input-output tables for 1963

The basic 70 industry/commodity input-output tables for 1963 have now been completed. A booklet containing them and various other related tables is now being prepared, but it will be several months before this can be published. Potential users of the tables who wish to have early access to them for further analysis, or would prefer the data in computer readable form, should write to the Information Officer, Central Statistical Office, Great George Street, London, S.W.1.

Fuel and power

The *Ministry of Power Digest of Energy Statistics 1968 and 1969* continues, under a new title, the series of annual statistical publications dealing with United Kingdom energy statistics. It is due to appear in August and includes all the more important series in earlier *Statistical Digests*. There are changes in content and order so as to distinguish more clearly the sources of the constituent statistics. Wherever possible the views expressed by users in response to the questionnaire issued with the 1967 *Digest* have been taken into account in preparing the new publication.

The main emphasis in the tables in the *Digest of Energy Statistics* is now on annual statistics. Some quarterly series are included to supplement the weekly and monthly fuel statistics issued to the press by the Ministry and/or published in the *Monthly Digest of Statistics*. These, and other fuel and power statistics including a number of annual series no longer separately published, are also available on request from the Statistics Division, Ministry of Power, Thames House South, Millbank, London, S.W.1. The possibility is being examined of introducing a new regular short-

term publication devoted to statistics of energy production and demand including figures adjusted for seasonal and temperature variations as well as unadjusted data.

The new tables in the Energy section, giving a detailed analysis of energy consumption in 1968 expressed throughout in therms, trace fuel consumption from the use of primary fuels through conversions into other forms of fuel (including transfers between and use by the secondary fuel producers) to consumption by final users. A new table in this section shows the principal cash flows in 1967 in the energy economy as a whole.

Other sections of the *Digest* deal with the primary fuels – coal, petroleum and natural gas – secondary fuel production and consumption covering gas, electricity – including primary nuclear and hydro electricity – coke ovens and coke and manufactured fuel. The tables of coal and other solid fuel consumption have this year been revised to show consistent statistics for each main sector in the whole United Kingdom; hitherto consumption in Northern Ireland was not analysed by consuming sectors in most tables but was represented in total by shipments from Great Britain. Wherever possible the consumption statistics have also been presented in such a way that the derivation of the figures for the corresponding sectors shown in the Energy section can be deduced. The final sections give tables of prices and values of fuels, consumption of coal and liquid fuels by larger industrial users derived from regular returns rendered by industrial fuel consumers, data from the annual census conducted by the Ministry of Power of the four principal fuel industries and details of fuel imports and exports derived from the official trade statistics. The last section summarises production of minerals (other than coal) and employment at the mines and quarries producing these minerals.

Reference

Ministry of Power Digest of Energy Statistics 1968 and 1969, (HMSO), August 1969

Iron and steel

For many years iron and steel statistics have appeared annually in *Iron and Steel Annual Statistics for the United Kingdom* of which the volume covering 1967 was published by the British Steel Corporation on behalf of the Iron and Steel Statistics Bureau, which is jointly managed by the Corporation and representatives of the private sector of the steel industry. A similar volume covering 1968 is in preparation, and may be ordered from the Iron and Steel Statistics Bureau, 151 Gower Street, London WC1.

In addition a new publication has now been issued: *British Steel Corporation, Annual Statistics for the Corporation 1968* (28 pages. Available from B.S.C.

Statistics Division at the same address, price 10s.). For the parts of the industry that are wholly owned by the Corporation in consequence of the Iron and Steel Act 1967, this book sets out a selection of statistics compiled mostly on a similar basis to those customarily published for the whole industry. Amongst subjects covered are production of ore, pig iron and crude steel; consumption of raw materials and fuels; receipts of imported steel for further processing; deliveries of various steel products to the home market and for export (with distinction of deliveries for further processing by the private sector of the steel industry); production of iron castings; employment, hours worked and earnings. Apart from the last, the statistics are in physical units or numbers. Financial statistics should be sought in the Corporation's Annual Report and Accounts, House of Commons Paper 161 (HMSO), March 1969 (Price 9s. 6d.).

Industrial floor space

A measure of the gross additions to industrial floor space in Great Britain for manufacturing industry is available from reports made to the Board of Trade by developers who have completed projects for which industrial development certificates (i.d.c.'s) were issued. These statistics, by Standard Regions, are regularly published in the *Monthly Digest* and the *Abstract of Regional Statistics*.

More recently the Inland Revenue have begun to compile statistics of the gross additions to rated floor space in various use classes, one of which is industrial. An article in the *Board of Trade Journal* of 18 June 1969 compares these statistics with i.d.c. completions and discusses the reasons for the differences. It concludes that the main reason is that the i.d.c. completions did not include ancillary space for storage, offices, etc. in industrial buildings in the period considered, April 1964 to March 1967, over most of the country, while this space is generally included in the Inland Revenue figures.

Since August 1966 ancillary space has been included in the floor area of all i.d.c.'s issued and, as these projects come to be included in the statistics of completions, the latter will be on a basis more comparable with the statistics of gross additions to rated industrial floor space.

Reorganisation of industrial statistics

The Government Statistical Service is continuing to initiate discussions with trade associations, and other industry interests, in preparation for the introduction, industry by industry, of the new quarterly sales inquiries as part of the new system of industry statistics, which was outlined by Mr. J. Stafford, Director of Statistics, Board of Trade, in *Statistical News* No. 1.

In addition to those mentioned in previous issues of *Statistical News*, pages 4.29 and 5.34, the following industries are now under review:

Milk and Milk Products (MLH 215)

Paint (MLH 274)

Metal furniture (MLH 399/1)

Lace (MLH 418)

Clothing (MLH 441-445, 449/1, 449/3, 449/4)

Packaging Products of Paper, etc. (MLH 482)

Toys, Games, etc. (MLH 494).

AGRICULTURE

Agricultural net output

The Ministry of Agriculture and Fisheries (as it then was) first published an index of agricultural net output in *Agricultural Statistics, U.K. Part II* in 1949. This was a base-weighted quantum index, using the average prices of the year 1945/46 as weights and with 1936/37-1938/39 as the base-period for time-comparisons. Net output was defined on a rather restricted basis as gross output *less* purchased feedingstuffs, seeds and livestock, including their processing and distribution costs.

This index was replaced in 1960 by a new and more comprehensive index, using the period 1954/55-1956/57 both for price-weights and for time-comparisons. More significantly, the coverage of inputs was widened to include all non-factor inputs *plus* depreciation, in order that the resulting 'net output' should accord more closely with the concept of 'value added' used for national accounting purposes. A fuller description of this index and of how it differed from the old one will be found in *Economic Trends*, March 1960.

Because more than eleven years had passed since the end-point of the base-period of this index, a rebased index using up-dated price weights was introduced at the 1969 Annual Farm Price Review. Index numbers were calculated for the years 1964/65 to 1968/69 (forecast), and were published in March 1969 in the White Paper *Annual Review and Determination of Guarantees 1969* (Cmnd. 3965). This revised index uses the period 1964/65-1966/67 both for price-weights and time-comparisons. Conceptually and methodologically it is virtually the same as its predecessor, but the opportunity has been taken for simplifying some of the calculations, and for re-grouping some components so as to bring their accounting treatment more into line with that used for current prices. It is hoped to publish a more detailed description in *Economic Trends* later this year.

Full-time farms in Scotland

Agricultural census data have been used as a basis for classifying Scottish farms by type since 1927 and for

splitting off full-time from part-time holdings. The number of full-time farms has been estimated by applying 'standard man-day' factors to the acreages of crops and numbers of livestock on each holding and classifying as full-time those with at least 250 standard man-days. There has, however, been some doubt about the appropriateness of applying labour requirements based on farms of average size to farms near the full-time/part-time boundary.

To arrive at an alternative, and perhaps more realistic, estimate of full-time farm numbers, the Department of Agriculture and Fisheries for Scotland conducted three inquiries between 1965 and 1967. Parallel inquiries were conducted in England and Wales and Northern Ireland. Over the three years approximately one in three of the holdings which fell between the 100 man-day and 350 man-day levels were visited by field staff. (Holdings beyond these limits were assumed to be part-time or full-time.) The key question in the inquiry was 'Is the farm as it stands capable of giving full-time employment to at least one man?' This question, however, was only reached after a series of questions designed to give the Field Officer a considerable amount of background information about the status of the holding and its occupier, so that the Field Officer was in a good position to evaluate the answer to the key question on the spot. Between them the three inquiries suggested that there was an average of about 26,000 full-time holdings in Scotland between 1965 and 1967 out of a total number of holdings of about 56,500. This compares with a figure of about 25,000 full-time holdings arrived at by a simple count of labour requirements.

Additional information collected in the course of the enquiry, primarily to enable the Field Officer to exercise his judgement in dealing with the key question, also provides a useful picture of the status of holdings in this sector. The results are contained in an article in *Scottish Agricultural Economics, Volume XIX, 1969* published by HMSO, price 7s. 6d.

Cattle management and feeding practices

The results of the 1966/67 survey referred to in the first issue of *Statistical News*, page 1.29, are now available. They show, *inter alia*, the average daily intake of concentrate feedingstuffs for each class of cattle, for each quarter of the survey period, and for each region. Other tables provide information on the proportion of cattle slaughtered at different ages; breeding practices in the dairy and beef herds; and, for the first time, an estimate of the breed composition of the beef breeding herd in England and Wales.

Copies of these tables may be obtained on application

to the Ministry of Agriculture, Fisheries and Food (Publications), Government Buildings, Tolcarne Drive, Pinner, Middlesex.

TRANSPORT

Seasonal adjustment of new registrations of cars

Seasonal adjustment factors for car registrations as for many other government monthly economic series are generally calculated by a computer programme using a variant of the American Census Method II (Shiskin). (See article on seasonal adjustment on page 6.15 of this issue.) The factors this gave for the years 1966 and 1967 were unacceptable because of the effect of changes in hire purchase controls and purchase tax and the movement of the new year 'Index' letter from January to August in 1967. The factors used for the year 1965 were therefore retained up to the end of 1968 but, as this is a series which has shown considerable changes in the seasonal pattern in the past, it seemed unreasonable to use 1965 factors again for 1969. It was, therefore, decided to try to make an assessment (necessarily rather subjective) of the effect of the various non-seasonal influences on the market since 1965 and to formulate new factors for the years 1966-1969.

A detailed note of the considerations involved and the resulting factors is available from the Ministry of Technology, Industrial Statistics Branch, Room 614, Dean Bradley House, Horseferry Road, London, S.W.1 (Telephone 01-799 5688, ext. 34). In brief, the procedure was to examine the factors shown by the Shiskin method in the 1965, 1966 and 1967 analyses and those shown by a generalised exponential smoothing programme using data up to October 1968 but to modify them to allow for the various extraneous influences. For example, it was clear that there had been an upward trend in the factors for the first three months of the year but that the computer programmes considerably over-stated this because of the pre-Budget anticipatory buying which has been a feature in recent years. This upward trend was partly due to the new year index letter being in January and the factor for this month has, therefore, been reduced now that this no longer applies. July and August needed considerable modification because of the movement of the new year index letter to August which had a relatively small effect in 1967 but a much larger one in 1968. It seemed reasonable to assume that the effect would continue to increase for at least another year. It does not appear to be having a discernible effect on other months. The last four months of the year have shown a downward trend but this should now be steady and the December factor has been assumed to rise in 1968 and 1969.

Money supply

An article on money supply and domestic credit was published in *Economic Trends* in May 1969. This outlined recent developments in monetary analysis, and introduced the concept of domestic credit expansion (DCE) which is used as an indicator of total credit extended to the domestic economy. Table 48 of *Financial Statistics* was refashioned in the June 1969 issue to show the derivation of DCE and its connection with the more familiar concept of money supply.

Public expenditure

A Green Paper *Public Expenditure: A New Presentation* (Cmnd. 4017), published in April of this year, contains proposals for the future presentation of public expenditure which the Government submitted to the Select Committee on Procedure and which, it is hoped, may form the basis of wider public discussion. The Green Paper notes that hitherto White Papers setting out the Government's plans for expenditure have been occasional rather than regular or systematic and that Parliament's consideration of public expenditure has been related almost entirely to the Supply Estimates for the forthcoming year. It is now proposed that there should be published towards the end of each calendar year a White Paper giving figures for the whole public sector for a number of years and in a form which would help to show the likely claims on resources by those public outlays.

In furtherance of this objective five main changes in presentation are proposed:

Figures for the year preceding publication, the year of publication (year 1) and each of the four following years (years 2 to 5) would be shown. While the estimates for years 1 to 3 would represent the Government's plans for public expenditure, those for years 4 and 5 would be merely projections of the cost of present policies.

Capital expenditure of the nationalised industries would be brought into the annual review in order that the full range of public expenditure might be considered at the same time and in the same context. Projections of public sector receipts at constant rates of central Government taxation would be shown along with the expenditure estimates for the period up to year 3. This enables tax flow-backs and other receipts related to expenditure to be taken into account in interpreting the expenditure itself.

In order to give an indication of the demand implications of different types of public expenditure, transactions would be classified into three categories corresponding broadly to three markedly

different degrees of use of resources.

Although the expenditure figures would continue to be given at constant pay and prices an allowance (the 'relative price effect') would be made for the likely change in the real cost of public sector purchases (particularly labour).

The adoption of the new form of presentation outlined in the Green Paper, apart from its policy and administrative implications, would have far-reaching consequences for the statistical procedures followed in the annual surveys and described in the article on public expenditure statistics which appeared in the February 1969 issue of *Statistical News*. The proposals for classifying expenditure broadly by degree of resource use and for including an allowance for changes in relative prices represent a considerable technical advance, which should make possible a more sophisticated assessment of the likely effect of expenditure proposals in relation to demand management and fiscal and monetary policy. These proposals are described in detail in a technical appendix to the Green Paper.

References

Public Expenditure: A New Presentation, Cmnd. 4017, (HMSO), June 1969. (Price 3s. 6d.).

'Public Expenditure Statistics' by P. M. Rees, *Statistical News*, page 4.10.

Tourist statistics

Britain's revenue from tourism – including fares paid to British carriers – represents over 10 per cent of the country's total earnings from invisible exports according to a booklet *Digest of Tourist Statistics* published by the British Travel Association, Britain's official tourist organization.

The 68-page booklet, the first complete compilation of its kind to contain all the basic statistics relating to tourism in Britain, is primarily concerned with visitor figures in terms of numbers and expenditure. For the first time, a detailed breakdown is given of the overseas motorist traffic to Britain.

The booklet shows the vast growth potential of tourism. While it took 15 years between 1946 and 1961 to achieve an increase in the number of visitors to Britain of 1½ million, it is estimated that a similar growth will be achieved in the three-year period 1967–1970. It is estimated that tourist expenditure will be increased by over £80 million between 1967 and 1970, compared with a 10-year period between 1955 and 1965 to gain the same increase.

Digest of Tourist Statistics is available, price 11s. (including postage), from British Travel Association, 64 St. James's Street, London, S.W.1.

CONSUMERS' EXPENDITURE

Family Expenditure Survey

The *Family Expenditure Survey Report for 1968* is to be published shortly. In addition to the analyses published regularly in these annual reports, this Report will include analyses of the weekly income and expenditure of the households surveyed according to the calendar quarter in which they co-operated. Such analyses were last published for 1961 in the Report for 1960 and 1961. The larger samples in 1967 and 1968 have also enabled the regional analyses to show expenditure averaged over these two years; previously data were averaged over periods of three years.

Analyses of total weekly income and expenditure averaged over all households which co-operated in the survey in the United Kingdom in 1968 have already been published in the *Employment & Productivity Gazette* in June 1969.

The Government of Northern Ireland is also to publish a report of a survey in that country in 1968 on the same lines as the United Kingdom survey. The households in Northern Ireland included in the United Kingdom survey were a sub-sample of those in the Northern Ireland survey.

PRICES

Retail prices: special indices for pensioner households

Two new series of special indices of retail prices for one-person and two-person pensioner households, as recommended by the Cost of Living Advisory Committee in their Report dated May 1968 (Cmnd. 3677), have been introduced by the Department of Employment and Productivity. They were first published in the June 1969 issue of the *Employment & Productivity Gazette*.

For the purpose of these indices, pensioner households are defined as households in which at least three-quarters of the total household income is derived from national insurance retirement or similar pensions and/or supplementary pensions or allowances paid in supplementation or instead of such pensions. The expenditures of such households are not used in the compilation of the weights for the general Index of Retail Prices.

The indices are chain-indices constructed in the same way as the general Index of Retail Prices and are based on January 1962 taken as 100. The weights used in each calendar year are derived from the expenditures recorded by the pensioner households which co-operated in the Family Expenditure Survey in the three years ended in June of the preceding years, revalued at the prices obtaining in January.

The indices exclude housing costs. All-items indices in the two series will be published quarterly in the *Gazette*, and annual averages for 'all-items' and the major group indices will be published annually.

Fares and housing costs

When presenting its report on *London Weighting in the Non-Industrial Civil Service* in November 1967 the NPBI asked the then Ministry of Labour to publish annually indices showing the movement of public transport fares and housing costs in London and in the provinces. The *Employment & Productivity Gazette* for March 1969 includes 1968 indices of rents and other housing costs and of fares in the Greater London area and in the rest of the United Kingdom. Indices for future years will be published in the March issues of the *Gazette*.

Reference

London Weighting in the Non-Industrial Civil Service, National Board for Prices and Incomes, Report No. 44, Cmnd. 3436 (HMSO), November 1967 (Price 3s. 3d.).

Purchasing power: international comparisons

For a United Nations Statistical Office project to compare actual prices for comparable goods and services in the United States and the United Kingdom, the Department of Employment and Productivity are preparing price dispersions for a number of goods and services which are included in the United Kingdom Index of Retail Prices.

NATIONAL BOARD FOR PRICES AND INCOMES

Recent reports

Top salaries in the private sector and nationalised industries, pay and conditions in the electrical contracting industry in Scotland, pay of salaried staff in the Imperial Chemical Industries Limited, pay and conditions in the clothing manufacturing industries, prices of toilet preparations, pay and duties of light-keepers, journalists' pay, armed forces' pay, and pay and conditions of workers in the exhibition contracting industry are amongst recent reports issued by the National Board for Prices and Incomes.

References

Top Salaries in the Private Sector and Nationalised Industries, National Board for Prices and Incomes, Report No. 107, Cmnd. 3970 (HMSO), March 1969 (Price 8s. 6d.).

Pay and Conditions in the Electrical Contracting Industry in Scotland, National Board for Prices and Incomes, Report No. 108, Cmnd. 3966 (HMSO), March 1969 (Price 2s. 0d.).

Pay of Salaried Staff in Imperial Chemical Industries Ltd., National Board for Prices and Incomes, Report No. 109, Cmnd. 3981 (HMSO), March 1969 (Price 7s. 0d.).

Pay and Conditions in the Clothing Manufacturing Industries, National Board for Prices and Incomes, Report No. 110, Cmnd. 4002 (HMSO), April 1969 (Price 6s. 6d.).

Manufacturers' Prices of Toilet Preparations, National Board for Prices and Incomes, Report No. 113, Cmnd. 4066 (HMSO), June 1969 (Price 3s. 6d.).

Pay and Duties of Lightkeepers, National Board for Prices and Incomes, Report No. 114, Cmnd. 4067 (HMSO) June 1969 (Price 3s. 6d.).

Journalists' Pay, National Board for Prices and Incomes, Report No. 115, Cmnd. 4077 (HMSO) June 1969 (Price 4s. 0d.).

Standing Reference on the Pay of the Armed Forces: Second Report, National Board for Prices and Incomes, Report No. 116, Cmnd. 4079 (HMSO), June 1969 (Price 10s. 6d.).

Pay and Conditions of Workers in the Exhibition Contracting Industry, National Board for Prices and Incomes, Report No. 117, Cmnd. 4088 (HMSO), June 1969 (Price 7s. 6d.).

INTERNATIONAL

*Institute of Management Sciences

The Institute of Management Sciences will be holding its 17th International Conference in London at Imperial College on 1, 2 and 3 July 1970. The first part of the Conference will be held jointly with the Operational Research Society whose national conference will immediately precede the TIMS Conference. About 1,000 participants are expected, of whom about 50% will probably be from the UK, 30% from the USA and 20% from the rest of the world.

The Conference will consist of about 18 sessions in which there will be papers and discussions on new techniques in the management sciences and on the contribution of management sciences to:

Manpower planning	Government strategy
Productivity measurement	Public systems
Marketing	Banking and finance
Distribution	Management education
Transportation	Information systems
Law enforcement	Business strategy

In addition there will be various evening activities and addresses from Mr. Stafford Beer and Professor K. D. Tocher.

The Chairman of the Conference is Professor Samuel Eilon of the Imperial College of Science and Technology.

Any enquiries about the sessions should be sent to one of the Joint Programme Chairmen, who are Professor L. S. White, Alfred P. Sloan School of Management, Massachusetts Institute of Technology, 50 Memorial Drive, Cambridge, Mass. 02139, U.S.A. and Mr. David R. Kaye, Arthur Andersen & Co., St. Alphage House, 2 Fore Street, London, EC2.

*International Social Security Association

The Department of Health and Social Security is a member of the International Social Security Association (ISSA) which was founded in 1927 with the aim of co-operating at the international level in the protection, promotion and development of social security throughout the world, through its technical and administrative improvement. In 1954 the ISSA in conjunc-

tion with the International Labour Office (ILO) set up a committee of social security statisticians and actuaries to organise an International Conference to provide an international platform for the study, from the statistical and actuarial point of view, of essential problems arising in the field of social security. The first International Conference of Social Security Actuaries and Statisticians was held in Brussels in 1956 and was attended by the Government Actuary and by a representative of the Ministry of Pensions and National Insurance. Subsequent conferences were held in Rome (1959), Madrid (1962) and Paris (1966). The latter conference discussed such subjects as 'Social Security and the National Economy', 'Projections of Changes in Salaries Employed in the calculation of Income from Contributions and Cost of Benefit', and 'Financial System for Retirement Pension Schemes complementary to social security, particularly those on assessment bases'. In addition to these three subjects the conference received papers relating to theoretical research in actuarial science, econometrics, operational research and statistics of general interest in the field of social security. Papers are published by the International Social Security Association.

In 1957 the ISSA decided to establish a permanent Committee of Actuaries and Statisticians 'in order to enable the Association to devote part of its activity on a continuing basis for study of the technical and statistical aspects of Social Security'. This committee met for the first time in London in 1958; the permanent British representative is Mr. C. E. Clarke of the Government Actuary's Department. The Committee has had several meetings and has discussed a number of social security questions of actuarial or statistical interest such as the problems of adapting benefits to changes in economic conditions, the actuarial assumptions for long-term evaluation of the cost of old age and survivors' insurance schemes, and actuarial and statistical studies for sickness insurance.

*International Union for the Scientific Study of Population

The International Union for the Scientific Study of Population will hold its Sixteenth General Assembly at the London School of Economics between 3-11 September 1969. The meeting which it is hoped will be attended by some 500 members will discuss all aspects of population growth and demography. There will be two plenary sessions: one to be addressed by Professor A. Sauvy of the Collège de France on the Demographic Situation of the World To-Day, to be

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held at 2.00 p.m. on Wednesday 3 September, and another on the Prospects for the Next Twenty-Five Years to be addressed by Mr. Milos Macura, the Director of the UN Population Division, to be held at 2.30 p.m. on Monday 8 September. For the remainder of the time the Conference will be divided into ten sections, each of which will have approximately five meetings. The sections are: Methods, Fertility, Mortality, Population Policy and Control, Economic Aspects of Demography, Social Aspects of Demography, Historical Demography, The Teaching of Demography, International Migration, and Internal Migration. Papers contributed to the Conference will be published in one or perhaps two volumes shortly after the Conference. The registration fee for non-members of the International Union will be \$25. Further information may be obtained from the Secretary-General and Treasurer of the International Union for the Scientific Study of Population, Department of Social Studies, The University, Leeds LS2 9JT.

Telecommunications and economic development

The Statistics and Business Research Department of the GPO is an active participant in a special working party of the International Telephone and Telegraph Consultative Committee studying the relationship between telecommunications and economic development. The group which met in March 1969 is now collecting data from telecommunications administrations on which to base their work. Apart from the main study, a by-product of this will be the compilation of more comprehensive and consistent international telecommunications statistics. If the work comes to fruition the results may have interest outside telecommunications as two of the topics being considered are pricing policy and investment in public utilities under conditions of capital scarcity.

Drugs consumption: Oslo symposium

Mrs. Kay Daniels of the Department of Health and Social Security, will act as an Adviser to a Symposium in Oslo in November on the consumption of drugs and other pharmaceutical preparations which is being organised by the Regional Office for Europe of the World Health Organisation in collaboration with the Government of Norway.

Consumption of drugs is a source of increasing interest from the medical and social, as well as from the economic, point of view. The Symposium will review existing information on consumption in Europe and discuss methods of measuring consumption by routine statistics and by special studies. It is intended to examine the possibility of including data on consumption of drugs and other pharmaceuticals in

national health statistics with a view to improving and standardizing the information.

PUBLICATIONS

***National Institute Economic Review**

The May issue of the *National Institute Economic Review* includes articles on 'The diffusion of new technology' by G. F. Ray and 'The competitiveness of British exports since devaluation' by R. L. Major. (Copies of this issue can be obtained from the National Institute Economic Review, 2 Dean Trench Street, Smith Square, London, SW1.)

The article on technology gives the results of an inquiry, conducted by the National Institute in this country and by other research institutes in Austria, France, West Germany, Italy and Sweden, into the diffusion of ten of the more important new manufacturing techniques adopted in the last fifteen to twenty years. These were: basic oxygen processes and continuous casting (steelmaking), special presses (papermaking); numerically controlled machine tools (metalworking); shuttleless looms (weaving of cotton and man-made fibres); float glass (glassmaking); tunnel kilns (brickmaking); modern methods of marking and cutting (shipbuilding); automatic transfer lines (car engine production); and gibberellic acid (brewing and malting).

Very tentatively the article suggests that the three most important and general influences on rates of diffusion of new techniques are effects on profitability, the general attitude of management and access to capital. In some cases the larger companies, which play a leading role in research and development and have a relatively sophisticated managerial set-up and comparatively easy access to capital, have played an outstanding part. In other cases, however, small companies have been foremost. There is some evidence that, presumably because of teething troubles, countries which are pioneers tend to have slow rates of diffusion. But the United Kingdom comes out very well from the international comparisons, in terms either of speed of introduction or of the level of diffusion ultimately reached.

The article on export competitiveness shows that in the year or so after devaluation the United Kingdom's share of world trade in manufactures fell exceptionally fast in terms not only of dollar value but also of volume. This was partly because the change in the pattern of trade, as measured by the relative growth of demand in different areas, was unusually adverse, but not, it would appear, because exports of capital goods

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initially responded less favourably to devaluation than other manufactured exports. The replies to special inquiries from firms in Australia, New Zealand and South Africa provide conflicting evidence about post-devaluation competitiveness. But even New Zealand firms, which were the most critical, appear to have switched some of their buying from other overseas suppliers to the United Kingdom. On the whole the replies to the inquiries give a rather more favourable impression than might have been expected in the light of actual performance. They may, therefore, point to a better result in 1969.

Annual Digest of Health Statistics

The Department of Health and Social Security are publishing in August 1969 the first of a new series of *Annual Digests of Health Statistics for England and Wales* (HMSO). The series aims to give the salient statistics for the health and closely related welfare services, in the form usually of ten-year trends (together with the earliest year after the inception of the National Health Service for which figures are available) and some detailed analyses for a recent year.

The first Digest includes the following sections:

Population and vital statistics

Finance of the National Health and Welfare Services

Manpower (hospital medical and other staff, general medical practitioners, general dental practitioners)

NHS hospital administrative statistics (beds, in-patients and out-patients treated according to speciality)

Selected Executive Council services (prescribing, dental treatment)

Local Health Authority domiciliary services (health visiting, home nursing, home help)

Residential and other services mainly for the elderly and disabled

Maternity and child welfare services

Psychiatric services (hospital and local authority care)

Preventive medicine (immunisation, mass radiography)

Morbidity (infectious diseases, cancer registration, non-psychiatric hospital cases, social security records of sickness absence)

It is planned to include Summary tables for Great Britain in due course.

Export markets for electronics

This publication on the European Free Trade area is the first in a series of statistical booklets on overseas markets for the electronics industry. It has been com-

plied by the NEDO in collaboration with the Department of Economic Affairs from material made available by the Board of Trade and is obtainable free from the Economic Development Committee for Electronics, National Economic Development Office, Millbank Tower, 21/41 Millbank, London, SW1.

Report of Race Relations Board

The Race Relations Board's third annual report, covering the period 26 November 1968 to 31 March 1969 (eight months of the 1965 Act and four months of the 1968 Act), has now been published and is obtainable from HMSO bookshops.

GOVERNMENT STATISTICAL SERVICE

Professor C. A. Moser

Professor C. A. Moser, Director of the Central Statistical Office, has been elected a Fellow of the British Academy.

Professor Moser has succeeded Sir Ronald Edwards as President of the Market Research Society.

Appointments

MINISTRY OF HOUSING AND LOCAL GOVERNMENT

Dr. I. C. R. Byatt, Senior Economic Adviser, Department of Education and Science has been appointed Director of Economics and Statistics at the Ministry of Housing and Local Government with effect from 1 July 1969.

MINISTRY OF DEFENCE

Mr P. B. Kenny, Statistician, has been promoted to a new Chief Statistician post.

Reorganisation in the Department of Health and Social Security

Following the merger of the Ministry of Health and the Ministry of Social Security, there is now a single Statistics and Research Division covering both Health and Social Security interests in these fields. The Director is Mr. W. Rudoe with Chief Statisticians Mr. K. M. Francis and Mr. D. Evans dealing with Health statistics and Mr. F. E. Whitehead dealing with Social Security statistics; the officers dealing with Research are Mr. J. B. Cornish (Health) and Mr. G. G. Beltram (Social Security). At the same time 'automatic data processing' and 'organisation and methods', which were formerly part of the Statistics and Research Division of the old Ministry of Health, have been linked with Social Security automatic data processing to form 'ADP and Health Service O & M Division' under Mr. D. H. Fulcher.

The Statistician Class

The table below shows the distribution of the Statistician Class by department and grade at 1 June 1969. The professional staff of the Statistical Service also includes some 50 members of the Scientific, Economist, and Research Officer classes.

Since its inception in 1946 the numbers in the Statistician Class have grown steadily. They reached 100 by 1959, and during the 1960's the pace of expansion has been even stronger, reflecting the widening range of information collected and of the analytical work called for.

Vacancies remain both at Assistant Statistician and Statistician level. Details of entry to permanent appointments are available from the Civil Service Commission, 23 Savile Row, London, W.1. Interviews for appointment of Assistant Statisticians are now held three times a year; recruitment to the Statistician grade is on a continuing basis. Cadetships are also given for postgraduate courses in statistics prior to entry as Assistant Statisticians. Opportunities for appointments on a 'temporary' or fixed-term basis are frequently advertised by individual departments.

<i>Department or Ministry</i>	<i>above Chief Statistician</i>	<i>Chief Statistician</i>	<i>Statistician</i>	<i>Assistant Statistician</i>	<i>Total</i>
Central Statistical Office	5	8	16	8	37
Board of Trade	4	8	25	6	43
Health and Social Security	1	3	8	4	16
Defence	1	2	11	2	16
Technology	1	2	7	3	13
Post Office	1	3	5	3	12
General Register Office	—	2	6	2	10
Power	1	2	5	1	9
Transport	1	2	4	2	9
Education and Science	1	2	5	1	9
Overseas Development	1	1	5	2	9
Agriculture, Fisheries and Food	—	1	4	4	9
Employment and Productivity	2	3	3	1	9
Economic Affairs	—	1	4	2	7
Housing and Local Government	—	1	4	2	7
Inland Revenue	1	2	3	1	7
Public Building and Works	—	1	3	2	6
Home Office	1	1	1	2	5
Treasury	—	2	—	1	3
Civil Service Department	—	1	1	1	3
Scottish Office	—	—	4	1	5
Welsh Office	—	—	1	—	1
<i>Total</i>	21	48	125	51	245

These figures exclude two part-time staff, two on loan from the Bank of England and three on special leave. They also exclude six Cadets taking post-graduate courses. They include some on loan to other bodies or serving overseas.

Of the 125 statisticians and 51 assistant statisticians, 31 and 20 respectively are employed on 'temporary' conditions of service.

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 and 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.

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