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UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF  
APPLIED ECONOMICS

THIRD REPORT  
ACTIVITIES IN THE YEARS  
1951-1953



*February 1954*



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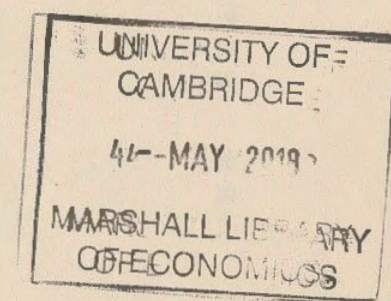
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## DEPARTMENT OF APPLIED ECONOMICS

THIRD REPORT  
ACTIVITIES IN THE YEARS  
1951-1953



February 1954





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UNIVERSITY OF CAMBRIDGE  
DEPARTMENT OF APPLIED ECONOMICS

*Director*

RICHARD STONE

*Committee of Management, December 1953*

E.A.G. ROBINSON (*Chairman*)

S.R. DENNISON

W.B. REDDAWAY

H.G. JOHNSON

Sir DENNIS ROBERTSON

N. KALDOR

J. WISHART

RICHARD STONE (*Secretary*)

Professor C. F. CARTER was also a member of the Committee of Management during the period covered by this Report. Mr J. E. G. UTTING acted as Secretary of the Committee during the Director's absence in the United States from January to June 1953.

THIRD REPORT OF THE DEPARTMENT OF  
APPLIED ECONOMICS

(covering the period July 1951 to December 1953)

I. GENERAL

1. In the years under review the Department's research programme continued to be based on the same fundamental aims that were outlined in our last Report.

2. Among the projects which were completed during this period are the inquiry into the national income of Nigeria, the results of which are contained in a Report published by Her Majesty's Stationery Office in the Colonial Research Series, and some parts of the work on demand analysis which are reported on in a volume to be published in the Department's Monograph Series.

3. The calculation of the annual index of the real product of the United Kingdom was put onto a routine basis and this part of the work may also be regarded as completed, so far as the Department is concerned. The routine calculations will in future be made by the Central Statistical Office, but we shall continue to work on certain fundamental problems concerning the construction of such index numbers.

4. Miss Deane's work on the construction of a system of regional social accounts for the United Kingdom was also completed and its main results are to be published in a volume which is now in preparation.

5. Very generous grants by the Rockefeller and Nuffield Foundations for work on the inquiry into the social accounts of Cambridgeshire enabled the Department to embark on the considerable volume of field work required in that project. Most of this field work will have been carried out by the end of 1954.

6. Work on the analysis of consumers' behaviour continued throughout the period under review although there were a number of changes in the research staff concerned. The trend towards the analysis of material derived from family budget studies and the use of post-war data, which was mentioned in our last Report, continued. The bibliography of the application of mathematical statistics to economics was brought up to date during the summer of 1951 and other projects on which work continued during the period included the studies of domestic asset formation and the balance of payments of the United Kingdom over the years 1920-38, and international comparisons of real income.

7. Early in 1953 the Government announced that it would make available, for certain kinds of economic research, funds which had been derived from United States Conditional Aid. The Department, in co-operation with the Board of Trade, submitted a proposal for an inquiry into interindustry relationships in the United Kingdom involving the construction of an input-output table for 1948 which was to be carried out jointly by the Department and the Board of Trade. This project was approved for a grant out of the Conditional Aid monies and work on it is now in progress.

8. Other projects financed out of Conditional Aid funds are being carried out under the direction of several members of the Faculty of Economics and Politics. A special group, the Industrial Research Group, has been set up for this work, and shares premises and certain other facilities with the Department.

9. Another new project which was initiated and largely completed during the period is a study of the lognormal distribution with particular reference to its applications in economics.

10. Towards the end of 1953 arrangements were made with the Social Science Research Council in the United States under which that body was to make a grant to the Department to enable Miss Deane to work on part of an international study of the growth of income and wealth which is in the charge of Professor Simon Kuznets. Miss Deane's work, which started at the beginning of 1954, is concerned with the long-term growth of income and wealth in the United Kingdom.

II. FINANCE

11. The grants made by the Rockefeller and Nuffield Foundations for the general support of the Department's work as opposed to support for specific projects came to an end in 1951 and since that time the University has made provision out of its general funds for the normal



continuing expenditure of the Department. Projects for which special funds have been received are as follows.

12. The Colonial Office and the Government of Nigeria financed the whole of the inquiry into the national income of Nigeria which was completed in 1952 and published in 1953.

13. Arrangements were made in 1951 under which the University receives special grants from the Rockefeller and Nuffield Foundations for the inquiry into the social accounts of Cambridgeshire. These grants of £19,500 by the Rockefeller and £6500 by the Nuffield Foundation are for the years 1952-55 and are primarily intended to cover the costs of the field work involved in the inquiry and of the tabulation and analysis of the considerable volume of material which is being collected. The Department is extremely grateful to these two Foundations for their generous assistance without which this collection of data would not be possible and to the many individuals and organizations in Cambridgeshire which have made the basic data available.

14. Since the reorganization of the London and Cambridge Economic Service at the end of 1951 the Department has provided clerical, computing and secretarial services for which it is reimbursed by the Service.

15. In 1953 the Treasury undertook to meet expenditure up to £9816 over the years 1953-56 in connexion with the inquiry into interindustry relationships which the Department has undertaken in co-operation with the Board of Trade and in which many Government departments are co-operating.

16. Finally, the Social Science Research Council of the United States made a grant to the Department in 1953 to enable the work on long-term economic growth, mentioned in paragraph 10 above, to be undertaken by Miss Deane.

### III. RESEARCH ACTIVITIES, 1951-53

17. In the paragraphs which follow, the Department's research programme during the period July 1951-December 1953 is described under five heads:

- (a) Studies and surveys in economic theory.
- (b) The collection of data.
- (c) Statistical and other methods of analysis.
- (d) Applied analysis.
- (e) Miscellaneous.

18. A number of the research projects could, of course, be classified under more than one of these heads, but such work has been described in that section where its main emphasis seems at present to lie.

#### (a) Studies and Surveys in Economic Theory

##### *The Theory of Consumers' Behaviour*

19. Most of the work on this subject has been undertaken as a basis for empirical work and is described in section (d) below. The following subjects, which have been studied intensively, may be mentioned here: quality variations in the consumption of individual households as reflected in the prices paid for the commodities; the form of the Engel curve; specific and general scales of equivalent adults; consistent systems of demand relationships; changes in tastes and habits; and irreversibility of demand relationships.

##### *Social Accounting*

20. Work on the concepts and classification systems involved in social accounting was continued during the period of this Report. In September 1951 the Director, in company with Mr Kurt Hansen, presented a paper at the Royaumont meeting of the International Association for Research in Income and Wealth on 'Inter-Country Comparisons of the National Accounts' (Reprint Series, No. 73); this was published in *Income and Wealth*, Series III. In company with Mr Utting he presented a paper at a conference on interindustry relationships held at Driebergen in September 1950 on 'The Relationship between Input-Output Analysis and National Accounting' (Reprint Series, No. 70) which has been published in a volume entitled *Input-Output Relations*. The Director also contributed an essay on 'The Use and Development of National Income and Expenditure Estimates' (Reprint Series, No. 47) to *Lessons of the British War Economy* which was published for the National Institute of Economic and Social Research in 1951.

21. Professor F. Sewell Bray (who now holds the Stamp-Martin Chair of Accounting at Incorporated Accountants Hall) has continued his work in the Department on the accounting basis for the classification and measurement of transactions. His papers on 'Accounting Principles' and 'Company Accounting' have appeared in *Accounting Research* and the *Journal of the Statistical and Social Inquiry Society of Ireland* (Reprint Series, Nos. 59 and 61 respectively). Among his other publications in this period mention may be made of *The Accounting Mission* (1951) published by the Melbourne University Press and *Four Essays in Accounting Theory* (1953) published by the Oxford University Press. His paper on 'The Formal Principles of Company Accounting' is to appear in *Accounting Research*.

22. In 1951-52 work was undertaken by the Director and Dr Prais on some of the problems involved in constructing consistent systems of price and quantity index numbers. The results were published in the *Economic Journal* in a paper on 'Systems of Aggregative Index Numbers and their Compatibility' (Reprint Series, No. 65).

23. In 1953 Mr Milton Gilbert of the Organization for European Economic Co-operation and the Director undertook a survey of 'Recent Developments in Social Accounting' which was presented at the meeting of the International Statistical Institute in September of that year. This will appear in the proceedings of the conference and is reprinted in *Accounting Research*.

##### *Models of the Economic Process*

24. In July 1951 the Director presented to a conference on Automatic Control held at Cranfield a paper on the mathematical form of a number of simple models of the economic process. This work was followed by a paper on 'Model Building and the Social Accounts: a Survey' presented in 1953 to the Castelgandolfo meeting of the International Association for Research in Income and Wealth which is to appear in *Income and Wealth*, Series IV. More recently he has been concerned with problems of formulating and applying systems of demand relationships which possess certain theoretically desirable properties.

#### (b) The Collection of Data

##### *National Income of Nigeria*

25. Dr A. R. Prest and Mr I. G. Stewart completed their work on this inquiry during October 1952 and their Report, entitled *The National Income of Nigeria, 1950-51* was presented to the Colonial Office shortly afterwards. The Report was published by Her Majesty's Stationery Office in the Colonial Research Series in 1953 and an abridged version will be printed as an official pamphlet in Nigeria.

26. Active work on the inquiry, which was financed jointly by the Colonial Office and the Nigerian Government, was begun at the Department in September 1950. Dr Prest and Mr Stewart visited Nigeria in December 1950 to establish contacts and to arrange for the collection of information during 1951 by Mr Stewart and an African assistant, Mr G. Lardner, who was seconded from the Lagos Secretariat from February 1951 until August 1952. Dr Prest returned to Cambridge in January 1951 but spent almost two months in the colony during the summer vacation when he reviewed the progress of the field work and intensified the work being done on a wide range of problems, notably those raised by the manner in which the Nigerian Government accounts were cast.

27. Mr Stewart returned to Cambridge in December 1951 and the next stage, that of piecing together the relevant data to provide useful estimates, was begun in 1952. During the work of analysis Mr Lardner acted as the inquiry's liaison in Lagos, dealing with the many queries that inevitably arose as the work neared completion.

28. As a result of the inquiry it has been found possible to provide not only detailed estimates of the total domestic product and gross national income of Nigeria but also output and expenditure figures for each of the three main regions, information likely to be of particular use now that the Nigerian constitution is essentially federal. More important, the Report opens with a discussion of the conceptual difficulties attending the evaluation of the domestic product in an unspecialized economy, and describes how these and other practical problems can be resolved. In addition, the central, regional and local government accounts have been reformulated so as to distinguish more clearly current and capital transactions, estimates of the balance of payments and capital formation have been made, and much specific information on Nigerian internal trade has been included in an Appendix to the main work.



29. This project had the benefit of the advice of a committee comprising Professor Robinson, Professor Fortes of the Department of Anthropology, Mr Bauer, Miss Deane, a representative of the Colonial Office and the Director. The Department would like to express its gratitude to those not otherwise connected with its work who gave their assistance in the inquiry.

#### *Real Product of the United Kingdom*

30. The main calculation of this annual index of production, which is an estimate of the real gross domestic product and a measure of the production of the whole economy, was completed in 1951, and full details were published by Professor Carter in the *Journal of the Royal Statistical Society* in an article entitled 'Index Numbers of the Real Product of the United Kingdom' (Reprint Series, No. 52). In 1952 the index was revised and carried forward to 1951. This work was done by Miss S. Y. Mallett and Mr A. A. Adams under Mr W. B. Reddaway's direction, and the results were published in the *London and Cambridge Economic Service Bulletin* for September 1952.

31. In 1953 further calculations were made to bring the series up to 1952. This work was carried out in very close co-operation with the Central Statistical Office so that the results might be as comparable as practicable with its real expenditure estimates. A table of indices was published by the Central Statistical Office in the national income Blue Book 1946-52, and fuller results were given in the *London and Cambridge Economic Service Bulletin* for September 1953 (Reprint Series, No. 76).

32. These calculations are now on a routine basis and will, in the future, be taken over entirely by the Central Statistical Office. Work will however be continued in those parts of the field where there is still need for research and in particular on the more extensive use of Geary indexes.

33. A comparison with some pre-war years has been made by Professor Carter since he left Cambridge and appears in the *London and Cambridge Economic Service Bulletin* for December 1952.

#### *Regional Social Accounting*

34. The main object of this study is to construct and to apply to United Kingdom data a system of social accounts appropriate to regional economic analysis. Generally speaking the inquiry has taken the form of an attempt to break down the published social accounts of the United Kingdom into the twelve standard regions with special reference to the year 1948. For some components, however, independent estimates of the national totals can be reached and the results can be extended to other years.

35. Special attention has been given to the problems involved in constructing a formal system of regional accounts designed to extract the information which is of most interest in principle from the records which are in practice available or accessible. The published data provided by the 1948 and 1949 Censuses of Production, the 1949-50 earnings inquiry of the Board of Inland Revenue and the 1950 Census of Distribution have been supplemented by detailed inquiries into the following regional analyses: (1) the industrial breakdown of the wage and salary bill, (2) the account of local authorities, and (3) the net output of the agricultural and fishing industries. The co-operation of the relevant Government departments and of research institutions in these detailed inquiries is gratefully acknowledged and the Department is particularly indebted to the Ministries of Labour, Housing and Local Government, Agriculture and Food, to the School of Agriculture of the University of Cambridge, and to the National Institute of Economic and Social Research for making unpublished data available.

36. A paper on the regional breakdown of the United Kingdom wage and salary bill was read by Miss P. M. Deane to the Royal Statistical Society on 28 January 1953 and subsequently published in the Society's *Journal* (Reprint Series, No. 75). The main results of the inquiry are to be included in a volume on regional social accounting which is now in active preparation.

#### *The Social Accounts of Cambridgeshire*

37. Towards the end of 1951 the Rockefeller and Nuffield Foundations made grants, referred to in paragraph 13 above, for work on this inquiry. These sums, together with a contribution from normal Departmental funds, are estimated to be sufficient to cover the cost of the field work and tabulations for the construction of the social accounts of Cambridgeshire for one year, together with a number of associated pilot studies which are preceding the main investigation. The year chosen for the main study is that commencing 1 April 1953; but the collection of information, particularly from businesses, will continue for a large part of the following year.

38. A major part of the field work so far carried out has been concerned with the estimation of household income and expenditure. Three pilot studies, each using a sample of about 300 dwellings, were conducted in the city of Cambridge in February and June/July, 1952, and in parts of the South Cambridgeshire Rural District in November/December, 1952. In addition a smaller scale study of incomes and saving in Ely, using the methods employed by the Oxford Institute of Statistics in their national survey, was carried out in July/August, 1952. A paper based on experience of the first two of these studies and entitled 'Sample Surveys for the Social Accounts of the Household Sector', by Mr Utting and Mrs Cole, was read at the Cambridge meeting of the Econometric Society in September 1952, and appeared in the *Bulletin* of the Oxford Institute of Statistics for January, 1953 (Reprint Series, No. 72).

39. The main household inquiry began in April 1953 and continued for twelve months. During that period information was sought from just over 4000 addresses in Cambridgeshire. A detailed account of the methods of this inquiry is given in a further paper by Mr Utting and Mrs Cole, 'Sampling for Social Accounts—Some Aspects of the Cambridgeshire Survey', which was read at the 1953 session of the International Statistical Institute and will be published in the proceedings.

40. A feature of special interest in all these household inquiries is the high response rate which has been achieved. The second and third pilot studies and the main inquiry to date have all secured the co-operation of all adults at some 75-80 per cent. of all dwellings visited.

41. In co-operation with the Farm Economics Branch of the School of Agriculture, information about farm incomes and expenditure was sought from a random sample of 197 farms in Cambridgeshire during the winter 1952-53. The method employed was very similar to that used by the Farm Economics Branch of the School of Agriculture in their annual studies of farm incomes in the Eastern Region; but ours was a random sample whereas theirs is not, and we obtained certain additional information. This too was in the nature of a pilot study, which has been used in planning a further farm survey for the winter 1953-54. Information was provided by about 75 per cent. of the farms in the original sample.

42. A preliminary investigation of methods of collecting accounting information from small shopkeepers has been made, and three small-scale studies of particular trades have been carried out. The study of the larger businesses is proceeding by way of personal contact. It is hoped to obtain the co-operation of a number of the largest concerns operating in the county, both manufacturing and distributive, before attempting a general inquiry in this field.

43. Some first results of the farm and shop inquiries are also given in the International Statistical Institute paper referred to above.

44. The analysis of College accounts by Mr A. A. Garrett has continued. This work is now at the stage of consultation with certain College Bursars. Work on the University accounts is still in its initial stages.

#### *Interindustry Relationships in the United Kingdom, 1948*

45. The Department is collaborating with a number of Government departments in a study of interindustry relationships in the United Kingdom. The work has as its object the construction of a more detailed input-output table for the United Kingdom in 1948 than has yet been compiled, and also the further development of the theoretical background of input-output analysis.

46. The first task to be undertaken is the construction of the input-output table. The basic concepts have been examined and preliminary plans for this work have been made. A note on the procedure for the extraction of Census of Production material has been submitted to the Board of Trade, and a further paper on outstanding problems is under discussion by the Cambridge committee. It is hoped that the detailed extraction of information for Census of Production trades will be carried out at the Board of Trade, while other sectors will be covered by the Cambridge staff in co-operation with the Government departments concerned.

47. The general direction of the project is being undertaken by a steering committee representative of the Central Statistical Office, the Department of Scientific and Industrial Research, the Board of Trade, the London School of Economics and the Department. Government departments particularly concerned have appointed liaison officers to assist in the collection of data. The work in Cambridge has the advice of a further committee, the members of which are Mr W. Duane Evans



of the U.S. Department of Labor (1953-54), Mr Goodwin, Mr Marris, Mr Reddaway, Mr Rostas, Mr Adams, the Director and the research workers concerned. Mr Rostas supervises the Cambridge work on the compilation of the input-output table, which is in the charge of Mr I. G. Stewart, assisted by Mr J. Aitchison and, until August 1953, Mr A. B. Neale.

#### *Domestic Asset Formation in the United Kingdom, 1920-38*

48. Mr K. Maiwald has continued his work on asset formation in the United Kingdom, in which he has been assisted since October 1952 by Mr J. J. H. McGibbon. He has now completed estimates for agriculture, forestry, fisheries, housing, transport, electricity and other public utilities. Some of these have been carried back to earlier dates than 1920 (e.g. shipping, to 1850).

#### *The Balance of Payments of the United Kingdom, 1920-38*

49. This project forms part of the work on the national income and expenditure of the United Kingdom during the inter-war period undertaken by the Department and the National Institute of Economic and Social Research. The primary data consist of the Board of Trade estimates of the current account and some incomplete and partial series relating to the capital account. The official estimates have been subjected to a detailed re-examination and the available information on the capital account, including material published in Cmd 8354, have been brought together and analysed in order to obtain a more comprehensive and systematic picture of the inter-war balance of international payments. Mr S. Adler and Miss D. C. Paige have completed a report on this study and the manuscript is now being revised in preparation for publication.

#### *International Comparisons of Real Income*

50. Some of the theoretical and practical problems arising in international comparisons of the real product were reviewed in a paper on 'International Comparisons of Consumption' presented by Mr S. Adler and Miss D. C. Paige to the European meeting of the Econometric Society held at Cambridge in August 1952. Preliminary work on the available material for the United Kingdom, the United States, Canada, Eire, Sweden, and Denmark revealed that the existing data, however comprehensive, must be supplemented by specially collected series for certain categories if comprehensive coverage is to be attained.

51. During the summer of 1952 the Department co-operated with the Organization for European Economic Co-operation in an investigation of real income in the United Kingdom, the United States, France, Germany, and Italy. Miss Paige was granted special leave for six weeks to work in Paris and Germany on the German section of this investigation, and further work on the United Kingdom was done in Cambridge. A report on this study entitled *An International Comparison of National Products and the Purchasing Power of Currencies* has been published by O.E.E.C.

52. Detailed international comparisons of total real product have previously been based on the final expenditures of the countries under comparison. The possibilities and conceptual framework of the industry of origin approach were analysed in a paper on 'International Comparisons of the National Product: An Industry of Origin Approach' presented by Miss Paige and Mr Adler to the Third Conference of the International Association for Research in Income and Wealth (to be published in *Income and Wealth*, Series IV). A pilot study of the United States and the United Kingdom was initiated in this connexion.

#### *(c) Statistical and Other Methods of Analysis*

##### *The Lognormal Distribution*

53. Towards the end of the academic year 1952-53 the work begun in 1952 by Mr J. Aitchison on the study of the lognormal distribution in relation to data from the Cambridgeshire Survey was again taken up by Mr Aitchison and Mr J. A. C. Brown. It was decided to undertake research under the following three heads:

- (a) A theoretical study of the statistical properties of the distribution with particular reference to the problems of estimation involved.
- (b) A study of the applicability of the distribution as a description of the distribution of income and its implications.
- (c) A study of the use of the distribution in budgetary analysis and in the construction of economic models of demand behaviour.

54. This work is continuing and will form the content of a volume in the Department's Monograph Series. The following papers have also been prepared and are awaiting publication:

'Criteria for the Description of Income Distribution' by J. Aitchison and J. A. C. Brown (to appear in *Metroeconomica*).

'Notes on Incomplete Data in Economic Statistics' by J. Aitchison and J. A. C. Brown.

'The Distribution of a Positive Random Variable with a Discrete Probability Mass at the Origin' by J. Aitchison.

#### *Computational Methods*

55. Continued use has been made of EDSAC, the electronic calculator in the University Mathematical Laboratory, for which grateful acknowledgement is made to Dr M. V. Wilkes, the Director of the Laboratory. The construction of Edsac programmes designed to reduce the numerical work of multivariate correlation analysis, mentioned in the last Report, has been amply justified; analyses of up to thirteen variables at a time can now be completed with facility within a day of the elementary series being completed. Not only is there a considerable saving in computational time and energy but the use of the Edsac enables a number of hypotheses, such as are implied by different transformations of the variables, to be tested at little extra cost. With increasing experience in programming, it is proving economical to construct programmes for quite specific purposes, whereby several weeks work on the desk machines is replaced by a few hours on the electronic computer.

56. In addition to the programmes for regression analysis and for the analysis of family budgets, which include programmes capable of carrying out an analysis of covariance, much use has recently been made of 'Monte Carlo' methods in which, for example, different methods of estimation are tried out on a large number of random samples drawn from a known population. These methods are valuable when the more usual method of analysis proves ineffective. In the Department's work, the method was applied to estimation problems arising in distributions which follow the lognormal law, commonly found in economic statistics.

57. Matrix inversion, which arises in the computations already described, is also an important feature of input-output analysis and applications have been made in this field. With the co-operation of the Central Statistical Office, inversions have been made on the Edsac for the input-output tables published in the national income Blue Books for 1946-51 and 1946-52.

58. The experience of the Department in this field has been summarized in a paper by Messrs Brown, Houthakker and Prais entitled 'Electronic Computation in Economic Statistics' which appeared in the September 1953 issue of the *Journal of the American Statistical Association* (Reprint Series, No. 78). A paper was also read by Mr Brown to the March 1953 meeting of the Royal Statistical Society's London Study Section.

59. The work on electronic computation is currently being carried out by Messrs Brown and Aitchison.

#### *(d) Applied Analysis*

##### *The Analysis of Family Budgets*

60. Work on the analysis of the pre-war family budgets collected by the Ministry of Labour and the Civil Service Statistical and Research Bureau in 1937-39 was completed by Dr S. J. Prais before his departure on leave of absence for the University of Chicago in July 1953. A report of this work is contained in *The Analysis of Family Budgets, with an Application to Two British Surveys conducted in 1937-39 and their Detailed Results* by S. J. Prais and H. S. Houthakker, which is to be published by Cambridge University Press as Number 4 in the Department's Monograph Series. This volume contains a discussion of the conceptual, statistical and computational problems encountered in the analysis of budgetary data; a full account of the statistical analysis carried out over the last two years and its results; and detailed tables presenting the elementary information contained in the budgets in a form suitable for further analysis. Mr Houthakker, who is now at Stanford University, visited the Department to assist in the preparation of the Monograph during November-December 1952.

61. The main developments in the period were along three lines. First, the measurement of quality variations in commodities has been refined and the first results of this work were presented in a paper by Mr Houthakker and Dr Prais which was read to the Louvain meeting of the



Econometric Society in September 1951. This was subsequently published in *Économie Appliquée* under the title 'Les Variations de Qualité dans les Budgets de Famille' (Reprint Series, No. 67).

62. A second development has been the further investigation of the statistical form of the Engel curve. This has led to a paper entitled 'Non-Linear Estimates of the Engel Curve' by Dr Prais and published in the *Review of Economic Studies* (Reprint Series, No. 69).

63. The third development has been a closer study of the effects of household composition on the pattern of expenditure by means of equivalent-adult scales. A number of conceptual and statistical problems met in the estimation of these scales have been solved. The main results were presented by Dr Prais to the Cambridge meeting of the Econometric Society in August 1952 in a paper on 'The Estimation of Equivalent-Adult Scales from Family Budgets'. This paper was later revised and has been published in the *Economic Journal* (Reprint Series, No. 77).

64. The progress which had been made in this field by the end of 1951 was summarized in a paper by Mr Houthakker entitled 'The Econometrics of Family Budgets' which was read to the Royal Statistical Society in November 1951, before he left for the United States, and subsequently published in the *Journal of the Royal Statistical Society* (Reprint Series, No. 64).

#### *The Free Demand for Rationed Foodstuffs*

65. The value of the Department's estimates of demand elasticities for policy decisions has received further investigation and in this there has been a considerable degree of co-operation with a number of Government departments. A paper on 'Estimates of the Free Demand for Rationed Foodstuffs' by Mr Houthakker and Dr Tobin appeared in the *Economic Journal* (Reprint Series, No. 60), and the results of further investigations into the reliability of forecasts from econometric equations appeared as a note by the Director and Dr Prais in the *Economic Journal* (Reprint Series, No. 71).

66. The work on the forecasting of demand was continued during 1953 by Mr J.A.C. Brown, who joined the Department in January 1952, and by Dr Prais, though with further derationing measures the interest in applying calculations based on pre-war equations to forecast the free demand for rationed foods has declined. During 1952 and early 1953, however, many further forecasts in co-operation with the Ministry of Food and the Central Statistical Office were made of the current level of demand for rationed foods using improved equations calculated in connexion with the Director's work on demand analysis. Attention was also given to the prediction of demand for foods not now rationed as a test of the validity of using estimates of parameters derived from pre-war series.

#### *The Analysis of Post-war Food Budgets*

67. The use of more recent family budget surveys is being investigated by Mr Brown who has had experience with this type of work at the Ministry of Food. A sample of 6000 food budgets from households whose total income was recorded, obtained by the Ministry of Food in 1951, is under analysis along substantially the same lines as for the pre-war budgets, with the intention of deriving estimates of the income elasticities of demand and of equivalent-adult scales for foods in some detail. The analysis comprises further investigations into the behaviour patterns of households of different composition together with a methodological study of efficient methods of classifying households for such purposes. For the punched-card stage of the analysis acknowledgment is made to the Ministry of Food and the University Mathematical Laboratory for extending Hollerith machine facilities.

68. The main results at hand in 1953 were presented by Mr J.A.C. Brown to the Innsbruck meeting of the Econometric Society in a paper entitled 'The Consumption of Food in Relation to Household Composition and Income: an Analysis of Post-War British Budgets' which is to appear in *Econometrica*. In this paper evidence was presented supporting the hypothesis that Engel curves with the same elasticity of demand for a food commodity are applicable to families in different household composition groups, a scale factor alone being sufficient to allow for the differences between groups. The paper also presented estimates of the equivalent-adult scale for foods and different nutritional measures of the total diet, based on the same method of classifying the households according to their composition. Interest shown in these results by the Ministry of Food has led to a request to bring the analysis (which was based on data collected in 1951) up to date, and to extend it to a study of the food habits of older adults since the 1951 study provided evidence that the demand for food declines with age in the adult groups.

#### *Grouping Problems in Demand Analysis*

69. Arising out of the work on family budgets, where grouping of the data is a practical necessity with present computing facilities, a study of the effect of grouping in regression analysis was undertaken by Dr Prais and Mr Aitchison and the results presented to the Innsbruck meeting of the Econometric Society under the title: 'The Treatment of Grouped Observations'. The problem of heteroscedasticity, endemic in family budget analysis, was also dealt with in the same paper, which is to be published in the *Review of the International Statistical Institute*.

#### *Other Work in Demand Analysis*

70. Other papers on demand analysis which were referred to in the last Report and have since been published are 'The Demand for Food in the United Kingdom before the War' by the Director, in *Metroeconomica* (Reprint Series, No. 53), and 'Irreversible Demand Functions' by Mr Farrell, in *Econometrica* (Reprint Series, No. 63).

71. Mr Farrell, who left the Department in September 1951 to take up a Commonwealth Fund Fellowship, has continued some of the work which he began in the Department. He has now returned to Cambridge as a University Assistant Lecturer, and has prepared two papers, 'Demand for Motor Cars in the United States' which was read to the Royal Statistical Society in February 1954 and is to be published in the Society's *Journal*, and 'Some Aggregation Problems in Demand Analysis' which is to appear in the *Review of Economic Studies*.

#### *International Survey of the Consumption Function*

72. Mr R.E. Brumberg was appointed in October 1953 to work on a study to investigate the form and stability of the consumption function in a number of different countries. Various behaviour patterns that have been observed to hold in the United States are being tested for other countries with the aid of time series and cross-section data.

#### *(e) Miscellaneous*

#### *Application of Mathematics in Economics*

73. In October 1953, Mr S.N. Afriat was appointed to work on mathematical problems arising in the course of the Department's work. He has so far undertaken an investigation of quadratic forms which is relevant to the minimization and maximization problems arising in economic theory. He has prepared a paper entitled 'Symmetric Matrices, Quadratic Forms and Linear Constraints'.

#### *Bibliography of Applications of Mathematical Statistics to Economics*

74. Mr A.D. Scott of the London School of Economics again worked at the Department on this bibliography during the summer of 1951. He prepared a supplementary list of books and articles published during 1950 together with some omissions from the earlier compilation published in the *Journal of the Royal Statistical Society* (Reprint Series, No. 51). The supplement for 1950 was similarly published in the *Journal of the Royal Statistical Society* (Reprint Series, No. 74). It is hoped to extend the bibliography to the end of 1953.

#### *Assistance to Professor Robinson and Mr Rostas*

75. In addition to its own programme of work the Department is providing research assistance for Professor Robinson and Mr Rostas. Mr G.D. Garton assists Professor Robinson in his study of the structural adjustment of the United Kingdom economy to the post-war world, and Mr D.T. Healey assists Mr Rostas in an inquiry into the future for British exports to Commonwealth countries, having regard to the productive efficiency of different industries in those countries and in the United Kingdom. Mr Garton and Mr Healey were both appointed in October 1952.

#### IV. OTHER ACTIVITIES

##### *Seminars and Study Groups*

76. Thirty-seven seminars in econometrics and mathematical economics, attended mainly by members of the Department's own staff, members of the Faculty of Economics and Politics and members of the staff and students of the Statistical Laboratory, have been held during the period covered by this Report.



77. A class on matrix algebra, for which Aitken's *Matrices and Determinants* was used as a text, was arranged among members of the Department's research staff in the spring of 1952 and held nine meetings, in addition to two talks on the use of matrices in social accounting.

78. A further series of classes on regression analysis was held during the first half of 1953.

#### *University Relationships*

79. The Director has continued to serve as a member of the Faculty Board of Economics and Politics, on the Degree and Future Needs Committees of the Faculty, and until December 1952, on its Appointments Committee. He was a member of the Social Sciences Grant Committee of the General Board of the Faculties until it was discontinued in December 1953, and was a representative of the Faculty of Economics and Politics on the committee set up to consider the establishment of a Visiting Professorship in Social Theory. Professor Bray has given annual courses of lectures on 'Elements of Accounting', and Miss Deane lectured during the Lent Terms 1952 and 1953 on 'Economics of Primitive Societies'. Supervision of Research Students in applied economics, of candidates for the Diploma in Mathematical Statistics whose applied field is economics, and of undergraduates is undertaken by the Director and other members of the research staff.

#### *Relationships with Other Bodies*

80. At the end of 1951 the Director found it necessary to tender his resignation as an Honorary Secretary of the Royal Statistical Society owing to pressure of work and responsibilities necessitating his absence abroad, but continued his membership of the Council of the Society and of its Library Committee until the end of 1952-53.

81. In September 1951 a conference of the Royal Statistical Society was held in Cambridge and members attending paid a visit to the Department. A paper on 'The Economic Structure of Cambridgeshire' was read by Mrs Cole and Mr Utting, while Mr Houthakker presented a paper on 'The Applications of an Electronic Computer to Statistical Work', and Mr Watson one on 'Serial Correlation in Regression Analysis'.

82. In October 1951 the Director accepted an invitation from the Council of the Society of Incorporated Accountants and Auditors to become a member of a committee, on which Professor Bray also serves, to consider the accounting implications of changing money values.

83. In December 1951 a small joint committee of the Royal Statistical Society and the Society of Incorporated Accountants was set up at the instigation of the latter to consider the applications of statistics in accounting and business management, and the Director has taken part in the work of this group as one of the three representatives of the Council of the Royal Statistical Society.

84. In November 1952 Mr Bray was elected by the Council of the Society of Incorporated Accountants and Auditors as first holder of the Stamp-Martin Research Chair of Accounting tenable at Incorporated Accountants' Hall, London. The duties of the Stamp-Martin Professor are to advance learning and to promote knowledge in the subject of accounting.

85. The Department has continued its close association with the National Institute of Economic and Social Research. Professor Robinson and Mr Stone are Governors and members of the Institute's Council of Management, of which the former is Joint Chairman. The work on *The Measurement of Consumers' Expenditure and Behaviour*, Volume I, by Mr Stone was carried out at the National Institute, while the research work for No. 4 in the joint series, on *Income and Expenditure of Public Authorities in the United Kingdom*, which Mr Utting is now writing, was also undertaken at the National Institute.

86. As already reported in paragraph 51 the Department co-operated with the Organization for European Economic Co-operation during the summer of 1952 in a study of real income of various member countries.

87. In August 1952 the Director accepted an invitation to serve as a nominee of the Council of the Senate on an Advisory Committee associated with the administration of a bequest made to the Institute of Chartered Accountants by the late Percy Dewe Leake to be devoted to the advancement of 'the science of accounting and political economy including the subject of public finance and taxation'.

88. Office space and secretarial assistance have been provided by the Department to the London and Cambridge Economic Service in connexion with the preparation of its quarterly *Bulletin* which

now appears in *The Times Review of Industry*. The Director and several other members of the Committee of Management have continued their membership of the Executive and Editorial Committees of the Service. Mr Reddaway edits the *Bulletin*, and Mr Adams was appointed statistician to the Service from October 1953.

89. With the publication of the new official Index of Production, which made its first appearance in July 1952, the Department discontinued the L.C.E.S. Index of Industrial Production which had been prepared by Mr Adams and was circulated monthly to subscribers as well as appearing in the quarterly *Bulletins* of the Service. The construction and continued calculation of the L.C.E.S. Index provided valuable experience which was put at the disposal of the Central Statistical Office while working on the official index, and the Department desires to record its thanks to the newspapers, banks and other subscribers who supported this project, and to the many people in Government departments and industry who provided data month by month.

90. The 14th European Meeting of the Econometric Society was held at King's College in August 1952 and the Department took a leading part in the arrangements and the proceedings of the conference. Five papers were presented by members of the Department's staff and by Dr M. R. Fisher who has been associated with the Department's work.

91. Miss P. M. Deane continues to be the Secretary of the International Association for Research in Income and Wealth and is the editor of its *Bibliography on Income and Wealth*.

92. The Director is an Associate Editor of *Econometrica* and a member of the Editorial Board of *Metroeconomica*. During 1953 he served with Professor P. A. Samuelson and Professor T. C. Koopmans as a member of an evaluative committee set up to review *Econometrica*, and in November 1953 was elected a Vice-President of the Econometric Society.

93. The Director serves on a number of official committees. He is a member of the Interdepartmental Committee on Social and Economic Research, the Cost of Living Advisory Committee and the Retail Prices Technical Committee of the Ministry of Labour, and the Colonial Economic Research Committee. Mr Utting was a member of the Local Government Statistics Sub-Committee of the Interdepartmental Committee on Social and Economic Research.

94. A conference on Automatic Control organized by the Department of Scientific and Industrial Research in July 1951 was attended by the Director who read a paper on 'Simple Transaction Models, Information and Computing' (Reprint Series, No. 58) which was published in the *Review of Economic Studies*.

95. In November 1952 the Director took part in a conference on Logistics and Linear Programming arranged by the Admiralty Research Laboratory and read a paper on 'The Origins and Possibilities of Linear Programming'.

#### *Visits Abroad*

96. In August 1951 the Director visited Paris to attend an O.E.E.C. conference of national income statisticians from the participating countries to discuss the National Accounts Research Unit's Report on *A Simplified System of National Accounts* prepared under Mr Stone's direction.

97. The Director, Professor Bray, Miss Deane and Mr Utting participated in the conference of the International Association for Research in Income and Wealth which was held at Royaumont, near Paris, in August 1951, and the paper referred to in paragraph 20 was presented by Mr Stone in conjunction with Mr Kurt Hansen.

98. The 13th European Meeting of the Econometric Society was held at Louvain in September 1951, where three papers were presented by members of the Department's staff.

99. At the invitation of the Greek Ministry of Co-ordination, the Director paid a visit to Athens during April 1952 as advisor on economic and statistical research under the E.C.A. Technical Assistance Programme and in particular to advise on the form of the national accounts of Greece. He also delivered four lectures at the University of Athens on national income and national accounts.

100. During July 1952 the Director visited New York as chairman of a United Nations Committee of National Income Experts called together to revise an earlier report on the *Measurement of National Income and the Construction of Social Accounts*, referred to in the Department's First Report. The report of the committee entitled *A System of National Accounts and Supporting Tables* has since been published by the United Nations.



101. The Director spent the period January to June 1953 on sabbatical leave in the United States where he had accepted an appointment as Visiting Professor of Political Economy at the Johns Hopkins University, Baltimore, during the second semester of the academic year.

102. In September 1953, Mr Aitchison and Mr Brown attended and presented papers to the European meeting of the Econometric Society in Innsbruck.

103. Also in September 1953, the Director, Mrs Cole, Miss Deane, Miss Paige and Mr Utting attended the conference of the International Association for Research in Income and Wealth at Castelgandolfo, Italy. Three papers prepared at the Department were presented to the conference.

104. The Director, Mrs Cole and Mr Utting then attended and presented papers to the 28th Session of the International Statistical Institute in Rome.

105. Immediately prior to these conferences Mr Utting gave a lecture on household expenditure studies to a meeting of Swiss statisticians held in Zürich, and he later gave a similar talk at a seminar in Rome organized by the International Statistical Institute.

#### Visitors from Abroad

106. The Department has welcomed a number of distinguished economists and statisticians from abroad for varying lengths of time and several have given papers at the Department's seminars. In particular, Mr R. M. Goodwin of Harvard University was invited to spend the year 1951-52 at the Department as a Fulbright Fellow and was provided with working space at the Department from October 1951 until taking up an appointment as University Lecturer in Economics in October 1952.

107. Among other visitors to the Department were Professor Harold Hotelling of the University of North Carolina who spent a month during the summer of 1951 working in Cambridge; Dr Nathan Keyfitz of the Dominion Bureau of Statistics, Ottawa, in March 1952; Dr Marvin Hoffenberg of the Division of Interindustry Economics of the U.S. Department of Labor, and Dr Kenneth J. Arrow of Stanford University, in April 1952; Dr K. Medin of the University of Uppsala, and Dr Matti Leppo of the University of Helsinki, in May 1952; Mr J. de Mesquita Lara, Brazil, under a United Nations Economic Development Fellowship, in the summer of 1952; Mr B. Zlataric, Commercial Councillor to the Yugoslav Embassy, London, and Dr J. Djordjevic, Professor of Constitutional Law at Belgrade University, in October 1952; Professor I. Nakayama and Professor T. Takahashi of Hitotsubashi University, Tokyo, in July 1953; Professor Alexander Mahr of the University of Vienna, under a United Nations Economic Development Fellowship, during October and November 1953; Professor Philip C. Newman of the University of Karachi, and Mr R. S. G. Rutherford of the University of Sydney, in November 1953.

108. In June 1953 participants in a course on Social Statistics arranged by the British Council visited Cambridge and, after a talk by Mr Utting on the work of the Department, had discussions with members of the research staff.

109. A number of economists and statisticians from overseas have spent several months working at the Department in connexion with research grants. Among them were Mr Arne Jensen of the University of Copenhagen who worked at the Department under a Rockefeller Fellowship during the last quarter of 1952, Mr Arne Amundsen of the University Institute of Economics, Oslo, who spent the first six months of 1952 at the Department under a Scholarship awarded by the International Wool Secretariat; and Mr B. Thalberg of the same institute who studied in Cambridge under a Norwegian State Scholarship from October 1952 to May 1953. Dr William H. Brown of Yale University and Mr Morris Cohen of Harvard University both spent the academical year 1952-53 at the Department, the latter under a Sheldon Travelling Fellowship. Working space is being provided for Mr W. D. Evans of the Division of Interindustry Economics, U.S. Bureau of Labor Statistics and Professor R. W. Pfouts of the University of North Carolina, both of whom are spending the academical year 1953-54 in Cambridge, the former under a Rockefeller Public Service Award and the latter under a Social Science Research Council Fellowship.

## V. PUBLICATIONS

### Reprint Series

110. This series, which consists of selected papers contributed to learned journals and other publications by members of the Department's staff and others working in direct collaboration with the Department, is now circulated to 325 institutions and scholars at home and abroad. The following titles have been added to the series during the period covered by this Report.

- No. 43. 'Testing for Serial Correlation in Least Squares Regression, II', by J. Durbin and G. S. Watson (*Biometrika*, vol. 38, Parts 1 and 2, June 1951).
- No. 44. 'A National Balance Sheet', by F. Sewell Bray (*Accounting Research*, vol. 2, no. 3, July 1951).
- No. 45. 'The Geographical Distribution of Wealth in England, 1086-1843', by E. J. Buckatzsch (*Economic History Review*, vol. III, no. 2, February 1951).
- No. 46. 'The Real Product of the United Kingdom, 1946-1950', by C. F. Carter (*Bulletin of the London and Cambridge Economic Service*, August 1951).
- No. 47. 'The Use and Development of National Income and Expenditure Estimates', by Richard Stone (*Lessons of the British War Economy*).
- No. 48. 'The Effects of Rationing on Demand Elasticities', by J. Tobin and H. S. Houthakker (*Review of Economic Studies*, vol. XVIII, no. 3, 1951).
- No. 49. 'Some Thoughts on the Distribution of Earnings' by A. D. Roy (*Oxford Economic Papers* (New Series), vol. III, no. 2, June 1951).
- No. 50. 'Some Calculations on Electricity Consumption in Great Britain', by H. S. Houthakker (*Journal of the Royal Statistical Society, Series A* (General), vol. CXIV, Part 3, 1951).
- No. 51. 'Bibliography of Applications of Mathematical Statistics to Economics, 1943-1949', by A. D. Scott (*Journal of the Royal Statistical Society, Series A* (General), vol. CXIV, Part 3, 1951).
- No. 52. 'Index Numbers of the Real Product of the United Kingdom', by C. F. Carter (*Journal of the Royal Statistical Society, Series A* (General), vol. CXV, Part 1, 1952).
- No. 53. 'The Demand for Food in the United Kingdom before the War', by Richard Stone (*Metroeconomica*, vol. III, Part 1, 1951).
- No. 54. 'Clearing Bank Holdings of Public Debt, 1930-1950', by H. G. Johnson (*Bulletin of the London and Cambridge Economic Service*, November 1951).
- No. 55. 'Exact Tests of Serial Correlation Using Non-Circular Statistics', by G. S. Watson and J. Durbin (*The Annals of Mathematical Statistics*, vol. 22, no. 3, September 1951).
- No. 56. 'Relative Income, Absolute Income and Saving', by J. Tobin (*Money, Trade and Economic Growth* (1951)).
- No. 57. 'Some Problems in the Measurement of Changes in the Real Geographical Product', by W. B. Reddaway (*Income and Wealth, Series I* (1951)).
- No. 58. 'Simple Transaction Models, Information and Computing', by Richard Stone (*Review of Economic Studies*, vol. XIX, no. 2, February 1952).
- No. 59. 'Accounting Principles', by F. Sewell Bray (*Accounting Research*, vol. 2, no. 4, October 1951).
- No. 60. 'Estimates of the Free Demand for Rationed Foodstuffs', by H. S. Houthakker and J. Tobin (*Economic Journal*, vol. LXII, no. 245, March 1952).
- No. 61. 'Company Accounting', by F. Sewell Bray (*Journal of the Statistical and Social Inquiry Society of Ireland*).
- No. 62. 'Compensated Changes in Quantities and Qualities Consumed', by H. S. Houthakker (*Review of Economic Studies*, vol. XIX, no. 3, June 1952).
- No. 63. 'Irreversible Demand Functions', by M. J. Farrell (*Econometrica*, vol. XX, no. 2, April 1952).
- No. 64. 'The Econometrics of Family Budgets', by H. S. Houthakker (*Journal of the Royal Statistical Society, Series A* (General), vol. CXV, Part 1, 1952).
- No. 65. 'Systems of Aggregative Index Numbers and their Compatibility', by Richard Stone and S. J. Prais (*Economic Journal*, vol. LXII, no. 247, September 1952).
- No. 66. 'Safety First and the Holding of Assets', by A. D. Roy (*Econometrica*, vol. XX, no. 3, July 1952).
- No. 67. 'Les Variations de Qualité dans les Budgets de Famille', by H. S. Houthakker and S. J. Prais (*Économie Appliquée*, no. 1, January-March 1952).
- No. 68. 'An Exercise in Errors', by A. D. Roy (*Journal of the Royal Statistical Society, Series A* (General), vol. CXV, Part 4, 1952).
- No. 69. 'Non-Linear Estimates of the Engel Curve' by S. J. Prais (*Review of Economic Studies*, vol. XX, no. 2, February 1953).
- No. 70. 'The Relationship between Input-Output Analysis and National Accounting', by Richard Stone and J. E. G. Utting (*Input-Output Relations*, Netherlands Economic Institute, 1953).
- No. 71. 'Forecasting from Econometric Equations: A Further Note on Derationing' by Richard Stone and S. J. Prais (*Economic Journal*, vol. LXIII, no. 249, March 1953).
- No. 72. 'Sample Surveys for the Social Accounts of the Household Sector', by J. E. G. Utting and Dorothy Cole (*Bulletin of the Oxford Institute of Statistics*, vol. 15, no. 1, January 1953).



- No. 73. 'Inter-Country Comparisons of the National Accounts' by Richard Stone and Kurt Hansen (*Income and Wealth*, Series III, 1953).
- No. 74. 'Bibliography of Applications of Mathematical Statistics to Economics: Supplement for 1950' by A.D.Scott (*Journal of the Royal Statistical Society*, Series A (General), vol. cxvi, Part 2, 1953).
- No. 75. 'Regional Variations in United Kingdom Incomes from Employment, 1948' by Phyllis Deane (*Journal of the Royal Statistical Society*, Series A (General), vol. cxvi, Part 2, 1953).
- No. 76. 'The Real Product of the United Kingdom, 1946-52' by A.A.Adams (*Bulletin of the London and Cambridge Economic Service* (New Series), no. 6, September 1953, published in *The Times Review of Industry*).
- No. 77. 'The Estimation of Equivalent-Adult Scales from Family Budgets', by S.J.Prais (*Economic Journal*, vol. LXIII, no. 252, December 1953).
- No. 78. 'Electronic Computation in Economic Statistics' by J.A.C.Brown, H.S.Houthakker and S.J.Prais (*Journal of the American Statistical Association*, vol. 48, September 1953).

#### Monograph Series

111. The Cambridge University Press has so far published three volumes in this series containing reports of investigations which have been carried out by members of the Department's staff and others directly collaborating in its work. A fourth volume on *The Analysis of Family Budgets* by Dr S.J.Prais and Mr H.S.Houthakker is with the printers and should be available in 1954. In addition to a discussion of theoretical problems encountered in the analysis of budgetary data and results of the analysis carried out in the Department during the last two years, the volume will contain a large amount of tabular material from the records of the two large official and semi-official inquiries conducted in the years 1937-39.

112. A further volume to be published in this series is a study of the lognormal distribution and its application (see paragraph 53).

113. The titles of the first five volumes are as follows:

- No. 1. *The Measurement of Production Movements*. By C.F.CARTER, W.B.REDDAWAY and RICHARD STONE (1948). 135 pages.
- No. 2. *Social Accounts and the Business Enterprise Sector of the National Economy*. By F.SEWELL BRAY (1950). 100 pages.
- No. 3. *The Role of Measurement in Economics*. By RICHARD STONE (1951). 84 pages.
- No. 4. *The Analysis of Family Budgets*. By S.J.PRAIS and H.S.HOUTHAKKER. In the Press.
- No. 5. *The Lognormal Distribution*. By J.A.C.BROWN and J.AITCHISON. In preparation.

#### Studies in the National Income and Expenditure of the United Kingdom

114. Two volumes (Nos. 1 and 5) in this series, which was announced in previous Reports, have already been published. No. 3 will appear in 1954.

115. The series as a whole is jointly sponsored by the Department and the National Institute of Economic and Social Research and contains the results of research undertaken by economists in both institutions over the past decade. The Director is general editor of the series.

116. The titles of the first five volumes are as follows:

- No. 1. *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*. Vol. I. By RICHARD STONE assisted by D.A.ROWE and by W.J.CORLETT, RENÉE HURSTFIELD and MURIEL POTTER. February 1954. 448 pages.
- No. 2. *The Measurement of Consumers' Expenditure and Behaviour in the United Kingdom, 1920-1938*. Vol. II. By RICHARD STONE and D.A.ROWE. In preparation.
- No. 3. *Consumers' Expenditure in the United Kingdom, 1900-1919*. By A.R.PREST assisted by A.A.ADAMS. Early 1954. 174 pages.
- No. 4. *Income and Expenditure of Public Authorities in the United Kingdom, 1920-1938*. By J.E.G.UTTING assisted by GISELA EISNER. In preparation.
- No. 5. *Wages and Salaries in the United Kingdom, 1920-1938*. By AGATHA CHAPMAN assisted by ROSE KNIGHT (1953). 254 pages.

## VI. PREMISES AND FACILITIES

### Premises

117. The Department continues to be accommodated in two separate buildings, the temporary hut on the Downing Site and Lensfield. With the exception of computers, all of whom are housed in the main building on the Downing Site, both the research and assistant staff are at present about equally divided between both places. In addition, however, to a large corps of part-time or temporary assistants engaged in connexion with the Cambridgeshire project, working space has been made available at Lensfield for several visitors from abroad who participate in the Department's work.

118. Arrangements were made in the autumn of 1953 for the Joint Services Russian Course to release the accommodation which it had been occupying at Lensfield. This is now used by the Industrial Research Group of the Faculty of Economics and Politics, so enabling this group (which was set up to undertake various research projects financed by the Government with Conditional Aid funds) to share certain services with the Department.

119. Although the demolition of Lensfield has been several times postponed, it seems inevitable that this will now occur in the fairly near future. The provision of alternative accommodation is a matter which the appropriate University Departments are already working on, but the problem has not yet been solved.

### Library

120. During the period covered in this Report 452 books and 1303 pamphlets and papers have been added to the library. The Department now receives 176 periodical series, twenty-one of which are in exchange for the Reprint Series while fifty are gifts. The majority of books together with pamphlets, papers and current periodicals are shelved in the library. Government publications and a large number of old periodical series have had to be moved to an adjoining research room, while further old runs of periodicals are kept in a small storeroom leading off the library. It is no longer possible to increase shelf space in the library and an increasing number of volumes have to be accommodated in research rooms. The overflow of books from the main library causes some inconvenience to people working in the rooms affected and means that volumes are less readily accessible to other members of the research staff who wish to consult them.

121. At 31 December 1953 the library contained the following publications:

Books	1292
British Government publications	4672
Pamphlets, papers etc.	3393
Periodicals, series received:	
British	69
Foreign	107

### Equipment

122. The Department now has ten electric calculating machines (five Marchants, four Madas and one Monroe) and also an electrically operated sterling Add-Master. In addition, a Burroughs adding machine, a hand operated adding-lister and an electric Astra calculator are on loan to the Department. Two of the electric calculating machines have been in constant use since the Department began work and provision has been made to replace other obsolescent machines at the rate of two a year.

123. During the period of this Report the Department has acquired an improved electrically driven duplicator and a spirit duplicator which has proved useful in reproducing tabular material, diagrams and maps and for mimeographs of which only short runs are required. A dictating machine with amplified play-back has also been obtained and has been of great use in training interviewers for the inquiry into the Social Accounts of Cambridgeshire.



## VII. STAFF

### Research Staff

124. The following is a list of research staff at December 1953:

Mr J. R. N. STONE, M.A. (Cantab.), Fellow of King's College	Director
Mr S. ADLER, B.A. (Oxon.), M.Sc. (Econ.) (Lond.)	Senior Research Officer
Professor F. SEWELL BRAY (Stamp-Martin Research Professor of Accounting at Incorporated Accountants' Hall)	Senior Research Associate
Miss P. M. DEANE, M.A. (Glasgow)	Senior Research Officer
Mr K. MAIWALD, Ju. Dr. (Brno)	Senior Research Officer
Mr J. E. G. UTTING, M.A. (Cantab.)	Senior Research Officer
Mr A. A. ADAMS, M.A. (Cantab.)	Research Officer
Mr J. A. C. BROWN, M.A. (Cantab.)	Research Officer
Mrs D. E. COLE, M.A. (Cantab.)	Research Officer
Mr A. A. GARRETT, M.A. (Cantab.), B.Sc. (Econ.) (Lond.)	Research Associate
Miss D. C. PAIGE, B.Sc. (Econ.) (Lond.)	Research Officer
Dr S. J. PRAIS, Ph.D. (Cantab.), M.Comm. (Birmingham) (on leave of absence)	Research Officer
Mr I. G. STEWART, M.A. (St Andrew's)	Research Officer
Mr J. AITCHISON, B.A. (Cantab.), M.A. (Edinburgh)	Junior Research Officer
Mr S. N. AFRIAT, D.Phil. (Oxon.), M.A. (Cantab.)	Junior Research Officer
Mr R. E. BRUMBERG, Ph.D. (The Johns Hopkins University)	Junior Research Officer
Mr E. B. BUTLER, B.Sc. (Econ.) (Lond.)	Junior Research Officer
Mr F. G. FORSYTH, M.Sc. (Econ.) (Lond.)	Junior Research Officer
Mr G. D. GARTON, M.A. (Liverpool)	Junior Research Officer
Mr D. T. HEALEY, B.Sc. (Econ.) (Belfast)	Junior Research Officer
Mrs M. S. C. HEISELER, B.Sc. (University of Wales)	Junior Research Officer
Mr J. J. H. MCGIBBON, M.A. (Edinburgh)	Junior Research Officer
Mr W. J. K. THOMAS, B.Sc. (University of Wales)	Junior Research Officer

125. The following were also members of the research staff during the period covered by this Report but have now left the Department:

Mr H. S. HOUTHAKKER, ec.drs. (Amsterdam)	Research Officer
Mr G. S. WATSON, Ph.D. (North Carolina), B.A. (Melbourne)	Research Officer
Mr M. J. FARRELL, M.A. (Oxon.)	Junior Research Officer
Miss E. KELLY, B.A. (Cantab.)	Junior Research Officer
Mr A. B. NEALE, B.Comm. (Birmingham)	Junior Research Officer
Mr G. P. SMITH, B.A. (Cantab.)	Junior Research Officer

### Administrative Staff

126. The secretarial and clerical staff at December 1953 was as follows:

Mr R. M. D. DAVIES, B.A. (Lond.)	Miss A. P. HOBBS
Miss I. J. URSELL, B.A. (Reading)	Miss S. BELL
Mrs A. E. BROWNE	Miss M. A. COLMAN

127. The computing staff at December 1953 was as follows:

Mrs E. M. CHAMBERS, M.A. (Cantab.)	Miss G. SMITH
Mr R. A. ARNOULD	Miss V. C. CHAPMAN
Miss M. J. BOULTON	Miss E. CRACKNELL

128. In addition to a large number of part-time interviewers, the following full-time staff is employed especially for work on the Social Accounts of Cambridgeshire inquiry:

Mrs J. M. HALLIDAY	Mrs P. M. GRIGGS
Miss A. D. SCOTT	Miss M. R. LANGTON