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UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF APPLIED ECONOMICS

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Mrs. S. SIMON-TURNBULL
FOURTEENTH REPORT
ACTIVITIES IN THE PERIOD
OCTOBER 1973 TO SEPTEMBER 1974

Sidgwick Avenue Cambridge

UNIVERSITY OF CAMBRIDGE
DEPARTMENT OF APPLIED ECONOMICS



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Director

W.A.R. GODLEY

Committee of Management, July 1974

H.V. POSNER (Chairman)

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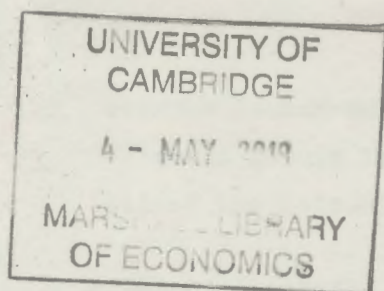
Secretary

Mrs. S. NIXON-TURNBULL

FOURTEENTH REPORT

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OCTOBER 1973 TO SEPTEMBER 1974



1975

UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF APPLIED ECONOMICS

Director

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Mrs. S. SIBSON-TURNBULL

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FOURTEENTH REPORT OF THE DEPARTMENT OF
APPLIED ECONOMICS

(covering the year October 1973 to September 1974)

I. Research Activities

1. This section outlines the work done in 1973-74, on the twentyeight research projects being conducted, and lists the two new ones which start in the current academic year.

(A) ECONOMICS AND ECONOMIC HISTORY

GROWTH AND FLUCTUATIONS IN THE BRITISH ECONOMY: PROJECTIONS FOR PLANNING

2. This project is under the direction of Professor Stone. The main results of the research so far undertaken are published in the series *A Programme for Growth* (London, Chapman and Hall) in which twelve volumes have appeared.

3. The research staff working with Professor Stone during the period covered by this Report were as follows: Dr. T.S. Barker, Mr. J.A. Beath, Dr. A.S. Deaton, Mr. M.A. King, Dr. D.A. Livesey, Mr. A.W.A. Peterson, Dr. L.J. Slater, Mr. L.A. Winters and Mr. V.H. Woodward. Dr. K.J. Wigley is closely associated with the project. Visitors to the project during the year included Professor B. Spencer and Professor G. Marion.

4. The main research of the project is the investigation and analysis of the present structure and future prospects of the British economy. The approach of the project has been to build a computable, disaggregated model of the economy and use it to demonstrate possibilities for the future. The model provides and maintains coherence and consistency between different proposals and policies. During the year extensive reprogramming was carried out so that alternative projections on a wide variety of assumptions about exogenous variables and endogenous parameters can be made easily. In addition there is now considerable flexibility in choice of both economic targets and policy instruments. Emphasis is now being given to projections for 1980.

5. During the year research has continued to be concentrated in seven areas: industrial pricing, consumers' expenditure behaviour, financial behaviour in the company sector, problems in controlling the economy, investment and employment functions, export functions, and the links between personal incomes and expenditures.

6. An important part of the work of the project is establishing the data base for the model. During the year the latest volume in the *Programme for Growth* series was published entitled 'Structural Change in the British Economy 1948-68' by A.G. Armstrong, a former member of the project. A new data base for the model, based on 1970 prices, has now been constructed with the help of the Central Statistical Office.

7. Dr. A.S. Deaton organised a conference on consumer behaviour for the Social Science Research Council in October 1973. Papers presented at conferences by members of the project, not included in the list of publications, were as follows:

Sixth International Conference on Input-Output Techniques, Vienna, April 1974.

BARKER T.S. 'Projecting alternative structures of the British economy'.

LIVESEY D.A. 'Optimization techniques and theory in the Cambridge Growth Project and the Leontief dynamic input-output model'.

PETERSON A.W.A. 'Factor demand equations and Input-Output analysis'.

STONE Richard. 'Random walks through the social sciences'.

European Meeting of the Econometric Society, Grenoble, September 1974.

DEATON A.S. 'A Simple Non-Additive Model of Demand'.

LIVESEY D.A. 'Some aspects of the theory of economic policy'.

KING M.A. 'Corporate policy, uncertainty and the stock market' (also presented to conference on 'Equilibrium and Disequilibrium in Economic Theory', Vienna).

8. The following articles by members of the project were published during the year 1973-74:

BARKER T.S. 'Economic Notebook', The Guardian, 8th October 1973.

BARKER T.S. 'An Input Output model of the British Economy' in the Medium Term, Models of the British Economy ed. Worswick and Blackaby, Heinemann, 1974.

DEATON A.S. 'Models and Projections of Demand in Post-War Britain', Cambridge Studies in Applied Econometrics Number 1 (forthcoming).

DEATON A.S. 'A Reconsideration of the Empirical Implications of Additive Preferences', *Economic Journal*, June 1974.

DEATON A.S. 'The Analysis of Consumer Demand in the United Kingdom, 1900-1970', *Econometrica*, Vol. 42, No.2, March 1974, pp. 341-367.

KING M.A. 'Taxation and Investment Incentives in a Vintage Investment Model - Reply', Journal of Public Economics, 1974.

KING M.A. 'Economic Growth and Social Development - A statistical investigation', Review of Income and Wealth, September 1974.

KING M.A. 'Taxation and the Cost of Capital', Review of Economic Studies, January 1974.

KING M.A. 'Dividend behaviour and the theory of the Firm' Economica, February 1974.

KING M.A. 'Profits Crisis that Isn't'. The Guardian, 14 November 1973.

LIVESEY D.A. 'The importance of numerical algorithms for solving economic optimization problems', International Journal of Systems Science, Vol. 5, May 1974.

STONE Richard 'Personal spending and saving in postwar Britain', Economic Structure and Development. (Essays in honour of Jan Tinbergen) North Holland, Amsterdam, 1973.

WINTERS L.A. 'United Kingdom exports and the pressure of demand - a note', Economic Journal, September 1974.

WOODWARD V.H. 'The role of disaggregation in medium term assessments' - In the Medium-Term, Models of the British Economy ed. Worswick and Blackaby, Heinemann, 1974.

WOODWARD V.H. 'Prospects for economic growth', The Times, 19 July 1974.

WOODWARD V.H. 'Economic Policy and the Energy Supply Situation in Britain', The Business Economist, Vol. 6, No.2, August 1974.

WOODWARD V.H. 'The Regional Dimension to Poverty' in Poverty Report 1974 ed. Michael Young, Temple Smith, London 1974.

EFFECTS OF ECONOMIC POLICY

9. Work in this related group of projects, which has so far been financed mainly by the S.S.R.C. continued throughout 1973-74 under the general direction of Mr. W.A.H. Godley. Research staff working on the project during part or all of the period covered were as follows: Mr. C.T. Taylor, Mr. J. Rhodes, Mr. B.C. Moore, Mr. R.J. Tarling, Dr. J. Llewellyn, Dr. M.H. Pesaran, Mr. T.F. Cripps, Mr. K.J. Coutts, Mr. M.J. Fetherston, Mr. S.F. Wilkinson, Mr. T.S. Ward.

Research has so far been divided into two categories - ongoing work on the effects of macro-economic policy, and a separate project on the effects of regional policy which is now almost completed.

REGIONAL POLICY

10. The work on regional policy, which has been undertaken by John Rhodes and Barry Moore, originally had the limited purpose of evaluating the effect of the Regional Employment Premium. But, as now seems obvious, it was impossible to assess the effects of one instrument of policy without thorough investigation of the effects of all the other instruments as well. Partly for this reason and partly because of the interest shown (for instance) by Government departments and the Select Committee on public expenditure, the study has become steadily larger and now comprehends all the main aspects of regional economic policy. This work now comprises a factual account of the post war experience of regional problems and policy together with a convincing quantitative assessment of the effectiveness of the latter. But it also suggests a theoretical framework within which the costs and benefits of policy gestures can be systematically evaluated. The approach is basically a macro or "Keynesian" one in that market forces are held not to generate a full employment equilibrium; it is also held that regional policy, under specified conditions, can generate higher output and employment in the relatively poor areas at nil or negative cost to the rest of the community.

ECONOMIC POLICY

11. The basic procedure has been to conduct and publish an annual review of British economic prospects and policies and to make this exercise determine the nature of the model used and also govern the priorities for research into individual topics and relationships.

During the first three years of operation summaries of the results of the annual review were published in the Times and the London and Cambridge Economic Bulletin, while supporting material in mimeo was circulated on request.

Initially, the main concern was the availability of real resources and their distribution between broad categories of expenditure. The analysis was based on construction of "par" series intended to show the underlying evolution of the economy, abstracting from cyclical fluctuations. Given public expenditure plans, the aim was to assess the volume of resources required for private investment and the balance of payments and hence to infer the availability of resources for private consumption. For this purpose the research effort was concentrated on

growth of productive potential, determinants of private investment and the terms of trade, and definition of appropriate trend targets for the balance of payments.

From this starting point the scope of the research was progressively extended to cover the following major policy issues.

- (a) 'Competitive' conditions for full employment with balance of payments equilibrium.
- (b) Fiscal and monetary conditions for balance of payments equilibrium.
- (c) Finance for the balance of payments and exchange rate policy.
- (d) Determinants of wage and price inflation.
- (e) Energy demand and the North Sea.

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1. Problems in the Management of the Economy 1971-75, mimeo, February 1972
2. Prospects for Economic Management 1972-76 and Statistical Appendix, mimeo, January 1973.
3. Prospects for Economic Management 1973-77 and Statistical Appendix, mimeo, January 1974.
4. Economic Policy Review No.1, February 1975.

13. Other papers

Public expenditure and economic management, memorandum to Commons Expenditure Committee, 1971-72, plus oral evidence by T.F. Cripps and C.T. Taylor (7th Report).

An analysis of the duration of male unemployment in Great Britain, 1932-73, T.F. Cripps and R.J. Tarling, Economic Journal, June 1974.

Output, the labour market and productive potential in the U.K., R.J. Tarling, M.H. Pesaran and W.A.H. Godley, forthcoming monograph.

The determinants of United Kingdom import prices, G.E.J. Llewellyn, Economic Journal, March 1974.

The determinants of United Kingdom import prices - a note, G.E.J. Llewellyn, and M.H. Pesaran, in progress.

Public expenditure and the management of the economy, T.F. Cripps, W.A.H. Godley and M.J. Fetherston, and Public expenditure and inflation, W.A.H. Godley, memoranda to Commons Expenditure Committee, 1974, (9th Report) plus oral evidence on June 17 and July 10.

Estimation of simultaneous relationships : a U.K. private expenditure function, M.J. Fetherston, in progress.

Money wage inflation in industrial countries, J.L. Eatwell, G.E.J. Llewellyn, and R.J. Tarling, Review of Economic Studies, October 1974.

Inflation in the U.K., W.A.H. Godley, to be published in the proceedings of the Brookings Institution Conference on inflation, November 1974.

Overlapping observations and lagged dependent variables in the analysis of wage and price changes, M.J. Fetherston, C.E.P.G. Discussion Paper No.2, March 1975.

Oil developments and the U.K. economy, 1974-80, C.T. Taylor, C.E.P.G. Discussion Paper No.1, August 1974.

The concept of a par economy in medium-term analysis, W.A.H. Godley and T.F. Cripps, published in The Medium Term : models of the British economy, edited by G.D.N. Worswick and F.T. Blackaby, 1974.

The rate support grant system, W.A.H. Godley and J. Rhodes, paper given to I.F.S. conference, November 1972, and published in the Proceedings of a conference on Local Government Finance, Institute of Fiscal Studies, Publication No.10.

Evaluating the effects of British regional economic policy, Economic Journal, March 1973.

The economic and exchequer implications of regional policy, memorandum to the Commons Expenditure Committee, 1972/73, plus oral evidence. A revised version of the memorandum to be published in 'The Relation of Small Economies to a Dominant Neighbour', ed. J. Vaizey.

Regional economic policy in the U.K., in 'Regional Policy and Planning', ed. M. Sant, 1974.

Regional economic policy in the U.K. in 'Regional economic policy : proceedings of a conference', Federal Reserve Bank of Minneapolis, U.S.A., 1974.

Regional policy and the Scottish economy, Scottish Journal of Political Economy, November 1974.

Regional policy and the economy of Wales, Welsh Office, 1975.

A quantitative analysis of the effects of the regional employment premium and other regional policy instruments, to be published in proceedings of a Department of Industry conference on the economics of industrial subsidies.

Regional economic policy and the movement of manufacturing firms to Development Areas, given to conference of the Regional Studies Association, April 1975; forthcoming in *Economica*.

The effects of British regional economic policy, forthcoming monograph.

CURRENT ECONOMIC ASSESSMENTS

14. The London and Cambridge Economic Bulletin which is published in The Times Business News is mainly concerned with the economic situation in the United Kingdom. Mr. M.L. Mackie is the Secretary and Statistician, and Mr. E. Bougourd is the Subscriptions Secretary.

15. In June 1974, the University of London Schools Examination Department reprinted 10,000 copies of The British Economy - Key Statistics 1900-1970 for use in the 'A' level examinations.

16. During the year the Bulletin changed its format and with the help of the Department of Applied Economics' assistant staff, it became an internally produced document at little extra cost. In order to assist Librarians and also to simplify subscriptions procedures, the former numbering system was revived. The Bulletin now also adopts articles of specific current interest and this was done with the articles on 'Cambridge Economics and the Balance of Payments' by Richard Kahn and M.V. Posner, which appeared in The Times in April 1974. Sales of the Bulletin at present exceed 1,000 copies.

17. The Bulletins published during the year were:

'Demand, inflation and economic policy' by W.A.H. Godley and T.F. Cripps, January 1974. (Bulletin No.84).

'The world economic situation' by Sir Alec Cairncross, July 1974. (Bulletin No.85).

PRICING IN THE TRADE CYCLE

18. Work on this project continued to be jointly directed by Professor W.D. Nordhaus of Yale University and Mr. W.A.H. Godley. Mr. K.J. Coutts has been working on the project full-time, Dr. M.H. Pesaran, Mr. M.J. Fetherston, Mr. R.J. Tarling and Mr. J. Rhodes part-time. The statistical work is now more or less complete and a substantial monograph will be available during the course of the present academic year and some of the main results have been communicated to the Treasury already.

19. A number of related studies of this research have appeared, in particular one by Dr. Pesaran 'A Dynamic Inter-Industry Model of Price Determination - A test of the Normal Price Hypothesis' published in the Quarterly Journal of Economic Research at Teheran University; also a short study 'Forecasting Retail Prices 1956-1974' by Mr. Coutts which appeared in the Cambridge Economic Policy Group's annual review in January 1974. Another publication generated by this project is by Dr. Pesaran, entitled 'Exact Maximum Likelihood Estimation of a Regression Equation with a First-Order Moving-Average Error', published in the Review of Economic Studies, October 1973.

GROWTH IN INDUSTRIALIZED CAPITALIST ECONOMIES

20. Work on this project began in 1972 and the first stage was completed with the publication of Occasional Paper No.40 Growth in Advanced Capitalist Economies 1950-60 in July 1973. Some views expressed in this paper were discussed in a seminar given by Messrs. Cripps and Tarling at the London School of Economics.

21. A study of the characteristics of the flow of labour through the unemployment register entitled 'An analysis of the duration of male unemployment in Great Britain 1932-73' was published in the Economic Journal, June 1974. An article

by Messrs. Tarling and Cripps was also published in New Society, November 1973, which demonstrated the relevance of the analysis to current labour market conditions. The final version of the article which appeared in the Economic Journal took account of some interesting comments received when the paper was presented to the Social Science Research Council Labour Studies Group in January 1974. Mr. Cripps presented a paper discussing advanced capitalist economies at a seminar at the University of Leicester.

22. An investigation of the determinants of employment in retail and wholesale distribution is nearing completion but is being delayed in order to include the final results of the Census of Distribution 1971 which have not been published as yet. Parallel studies for agriculture and manufacturing are now in progress.

SOME ECONOMIC AND SOCIAL IMPLICATIONS OF IMMIGRATION TO BRITAIN

23. This project was started in October 1972 and is being undertaken by Mr. B.M. Deakin and Dr. K. Prandy. Dr. A.N.E. Jolley of the University of Melbourne is collaborating on the project.

24. On the economics side work during the year has concentrated upon completing a Salter-type analysis of 28 industry sections over a period in which immigrant flows into Britain were relatively large. The economic impact of immigration is also being studied by the application of cross-sectional production functions.

25. On the sociology side an analysis has been carried out on the 1966 Census data, relating immigrant status to differences in socio-economic position and to inequalities in housing conditions. An article outlining these results is in preparation, and a similar analysis is being pursued on the 1971 Census data. Further work is also being done on both sets of data analysing patterns of residential segregation.

SOVIET ECONOMIC MECHANISM

26. This project was completed in December 1973. The findings have appeared in a number of publications.

INTENSIVE ECONOMIC GROWTH IN THE U.S.S.R.

27. The purpose of this project is to examine the nature and reality of the transition from 'intensive' to 'extensive' economic growth in the U.S.S.R. It is being undertaken by Dr. M.J. Ellman.

28. During the year Dr. Ellman gave an Open University radio broadcast on the use of mathematical methods in Soviet planning. In August 1974 Dr. Ellman was a delegate at an East-West conference of economists in Montreux, Switzerland, organised by the Conference on Labour Productivity of the International Economic Association. A lecture on 'The lessons of Libermanism' was delivered at the Universities of Cambridge and Groningen, Netherlands. Seminar papers on the sources of the increase in investment in the U.S.S.R. during the First Five Year Plan were presented at the London School of Economics and at Nuffield College, Oxford.

A note on 'The reorganisation of Soviet industry' was published in Ost Europa Wirtschaft 1974 No.1.

DIFFERENTIATION AND STRUCTURAL CHANGE IN PEASANT AGRICULTURE

29. Work continued along the lines described in previous Reports. Mr. D.M.G. Newberry has remained in charge of the project.

30. During the course of the year Mr. M. Cowen produced two papers: 'Patterns of cattle ownership and dairy production 1900-1965', and 'Concentration of sales and assets: dairy cattle and tea in Magutu, 1964-1971' (Working Paper No.146 of the Institute for Development Studies, University of Nairobi, March 1974). They tend to show that the main beneficiaries of development have been the middle rank peasants, rather than the wealthy or poor, in that their income from durable assets such as tea and cattle has risen faster than for the other groups. These findings are important in the context of the debate on the extent to which the main benefits of development are captured by wealthy farmers.

COMPARATIVE ECONOMIC STUDIES OF VARIOUS CODES OF PRACTICE PROPOSED FOR SHIPPING CONFERENCES

31. This research was carried out by Mr. B.M. Deakin, and completed during the year. An article setting out the results of this work was published in Maritime Studies and Management, July 1974, under the title 'Shipping Conferences. Some economic aspects of international regulation' by B.M. Deakin.

EMPLOYMENT BALANCE IN THE BUDGET

32. Work on this project, financed by The Institute of Fiscal Studies, began in July 1974. The basic objective of the research is to devise methods, linked to the Cambridge Policy Group's 'par' model, of estimating what the fiscal balance of the public sector would be if the economy were operating on a full employment growth path, and thereby to explore the use of this device as a guide to fiscal

policy. It involves estimating the variation in the yield of individual taxes associated with both different rates of real growth and different rates of inflation, and it will provide a measure of the automatic stabilising properties of the U.K. system of taxation.

33. The approach has been to start with simple techniques in order to arrive at a first approximate set of results and gain a feel of the problem. Later it may be necessary to move on to more sophisticated techniques.

34. The first stage has been to analyse variations in tax yields and other revenues since 1960, isolating automatic changes in revenue from those resulting from discretionary alterations in tax rates. For this purpose the government's own forecasts of discretionary changes have been used as a basis for the estimates for income tax and purchase tax. In the case of the excise duties, price and income elasticities have been calculated. Separate exercises have been undertaken - or are in the course of being undertaken - on Value Added Tax, Corporation Tax, local authority rates, the National Insurance Fund and the surplus earned by public corporations.

The work is being undertaken by Mr. T.S. Ward under the direction of Professor R.R. Neild.

AN INTERNATIONAL STUDY OF COMPANY PERFORMANCE

35. Output and labour productivity in manufacturing industry in the U.K. has increased at a slower rate than in other European countries, and these differences in national economic performance reflect and affect the performance of companies operating in the countries compared. Hitherto most of the attempts by economists to provide explanations for international differences in the growth of output and labour productivity in manufacturing industries have been based on analyses of aggregate data for economies or broad sectors of economies. For this study, information obtained from published company accounts and officials of companies is being analysed to find out more about the reasons for differences in the performance of companies, the interaction between the performance of companies and national economies, and to suggest possible changes which would help to improve the performance of British companies and hence the U.K. economy.

This research is being undertaken by Mr. C.F. Pratten.

MANAGEMENT ORGANISATION AND INDUSTRIAL RELATIONS

36. The aims of this enquiry, which included particularly an extensive programme of "structural interviews" at a large sample of industrial firms, were outlined in

previous Reports. The interview programme was carried out by Mr. D.J. Roberts under the supervision of Professor H.A. Turner.

37. Mr. Roberts left the Department for the British Leyland Motor Corporation before the results were fully analysed, but last year was released temporarily by the Corporation to help with this work. Thanks to this co-operation, a systematic survey of the relation between the liability of individual firms to labour disputes and the character of their managerial practice and organisation has been completed. The conclusions contradict much current conventional wisdom on this topic.

38. A substantial paper, 'Management Characteristics and Industrial Relations' has been drafted with a view to publication in the new Cambridge Papers in Industrial Relations and Labour series to be published by Cambridge University Press.

39. The interview programme's results can be applied to a number of other problems in this area: further analysis and publication is under consideration.

WAGE DETERMINATION AND WAGE DRIFT IN THE CONSTRUCTION INDUSTRY

40. The aims and methods of this study, conducted by Mr. L.J. Handy and supervised by Professor Turner have been described in previous reports.

41. A draft of a book on the subject is being revised with a view to early publication.

WAGES IN THE COAL MINING INDUSTRY

42. A study of wages policy in the coal mining industry, being made by Mr. L.J. Handy then under Professor Turner's supervision, was referred to in the Eleventh Report.

43. During the national mining stoppage of early 1974 an article by Mr. Handy and Mr. K.J. Coutts on 'Wage Differentials and Labour Wastage from the Mines' in New Society (which was an extension of an earlier analysis by Mr. Handy on the employment problem in mining published in New Society in November 1973) attracted wide attention: Mr. Handy subsequently submitted written evidence to the Pay Board's Enquiry on the Miners' wage claim: he is currently re-drafting a book on this and related aspects of wage policy in the industry.

LABOUR PROBLEMS IN DEVELOPING COUNTRIES

44. This study, for which a good deal of research (including field studies in underdeveloped countries) has been conducted by Professor Turner and Mr. D.A.S. Jackson, has figured in previous reports.

45. Two Reports of the Commission of Enquiry of the East African Community on the co-ordination of pay and incomes policies within E.A.C. services and Corporation and between the three "Partner States", were submitted by Professor Turner early in 1974. As noted last year, Professor Turner acted as Chairman, and Mr. D. Jackson and Miss P. Fosh as I.L.O. consultants. The findings have been under consideration by the East African Council and Finance Ministers, and an international committee of officials appointed to examine their recommendations. These appear to be controversial, but it is not supposed that publication of the Enquiry Commission's reports can be delayed indefinitely.

46. During the year Mr. Jackson co-operated with Mr. G. Macpherson, formerly a U.N.O. advisor on agricultural technology in East Africa, to produce a paper 'Village Technology for Rural Development' on the possibilities of very simple, very low cost techniques for peasant farming and other rural work in poor countries, where even the investment costs of so-called "intermediate technology" devices have proven prohibitive. The paper will be published in the International Labour Review in 1975. Mr. Jackson also published articles in New Society (16 May, 1974), on the effects of greatly increased fertiliser prices on agricultural development, employment and living costs in poor countries, and contributed a section on 'World Survey of Wages, Hours and Employment' for the Encyclopaedia Britannica Book of the Year.

47. In the summer Professor Turner was invited by the Government of Iran to advise on the development of wage and industrial relations policies in that country. A report was also made to the International Labour Office in this connection, at their own request; it is currently under consideration between the I.L.O. and the Iranian Government for release.

48. A considerable number of papers, articles and reports which have already been published in connection with this project is referred to in previous D.A.E. reports. A book is now at the redrafting stage.

INCOMES POLICIES

49. Work by Professor Turner in collaboration with several members of the D.A.E. staff and others has been noted together with various publications, in previous Reports. A second edition of Do Trade Unions Cause Inflation by Dudley Jackson, H.A. Turner and Frank Wilkinson is to be published in the new Cambridge Papers in Industrial Relations and Labour series.

50. Early in 1974 Miss Fosh and Mr. Jackson were asked by New Society to organise a survey, conducted through Opinion Research Centre, of public attitudes on incomes and prices. Some results were published in a long article in New Society of 7th February 'Pay Policy and Inflation; What Britain Thinks', and the detailed results are deposited with the S.S.R.C. Survey Archive. A paper by Mr. Jackson 'Thomas Hobbes' Theory of Taxation', was published in Political Studies (XXI, No.2, 1973.) A paper by Mr. Handy and Dr. T.S. Papola of Bombay University on Wages Policy in India was published in the Economic Journal of March 1974.

51. In 1967 Professor Turner was nominated by the I.L.O. to advise President Nyerere's government, and wrote a report which was published as a Tanzania Government White Paper and through the I.L.O. It provided the formal basis for that country's incomes policy. The rapid rate of world inflation has created certain problems, however, and following a preliminary report by Mr. Handy to the Tanzanian Government on the workings of Incomes Policies up to 1971, Professor Turner was invited to make further proposals to that government. Mr. Jackson has been released by the D.A.E. for several months to organise research for this review - the experience of which contributed also to the study of labour problems in development.

UNFAIR DISMISSAL

52. This is a major subject of labour disputes in developing countries, but has also recently become important in this country as an unforeseen surviving effect of the now repealed 1971 Industrial Relations Act. Mr. Jackson has produced a monograph under this title, which will be published as No.1 in the new series referred to above. The following article was published in the course of the year under review: "Unfair Dismissal - a guide for employers", Farm Management, September 1974.

LABOUR RESTRICTIVE PRACTICES

53. The background to this project is explained in the Thirteenth Report. It has particularly involved a review, by Mr. S.F. Wilkinson under Professor Turner's general supervision, of recent changes in demarcation and dilution rules and in other union regulations of the mobility or substitution of skills. This was undertaken in order to up-date material previously collected by Mr. G. Roberts, who left the D.A.E. to become Senior Industrial Relations Adviser first to the NBPI and later to the Office of Manpower Economics and Pay Board, has continued to act as consultant to the project.

54. This review has now been completed. A substantial draft paper on the reform of labour restrictive practices in the shipbuilding industry is under survey with a view to early publication in the new Industrial Relations and Labour series. Later publication of the results in all the industries covered is to be considered, together with further work on other kinds of restrictive or "protective" practices.

NATIONAL JOB EVALUATION

55. This project, on which work is at present being done by Mrs. Christine Craig under Professor Turner's guidance, was explained in the Thirteenth Report.

56. After a postal survey of the spread of job evaluation techniques and their use by large firms, a grant was secured from the Nuffield Foundation to enable an interview programme with selected firms to be undertaken. It was arranged that Mrs. Craig should visit Holland to investigate the recent history of the Dutch national job evaluation scheme.

57. An article entitled 'Job Evaluation and Incomes Policy' by Mr. M. Fores (who worked on an earlier stage of the study) appeared in Lloyds Bank Review for October 1974.

CONDITIONS OF MANUAL AND NON-MANUAL WORKERS

58. Arising from a previous project under this title, Mrs. Craig has published a paper with Mrs. Dorothy Wedderburn, 'Relative Deprivation in Work' in, Poverty, Inequality and Class Structure, edited by D. Wedderburn, C.U.P. 1974.

HUMAN PROSPECTS OF TROPICAL MINING AREAS

59. This project, which is directed by Professor H.A. Turner, is concerned with an aspect of world employment and labour problems which is particularly serious in developing countries with a large mining sector. It was described in some detail in the Thirteenth Report, which also noted that the Overseas Development Ministry had made a grant for a two-year study of the subject following some preliminary work by Mr. Handy. Mr. Philip Daniel (formerly an economist with the East African Community) was subsequently appointed as research officer to the project.

60. The project now envisages a general survey of the employment and related prospects of tropical areas currently dependent on mining, coupled with three national case studies. The general survey will take the form of a primarily statistical collection of material, and Mr. Daniel will undertake the first national case study in the Zambian Copperbelt. A report on this will be submitted to the

ODM and the Zambian government; material will also be made available to an ILO/World Employment Programme Mission recently appointed to advise the Zambian government on employment development in general.

61. Mr. Daniel will then carry out the second case study in the great new mining development on Bougainville (Papua-New Guinea). The third country to be examined is still to be selected.

DEVELOPMENT, INCOME DISTRIBUTION AND SOCIAL CHANGE IN EGYPT 1952-1970

62. The general aim of this research project, which is being carried out by Dr. M. Abdel-Fadil under the direction of Dr. C.H. Feinstein, is to look into the interrelationship between employment, income distribution and social change in Egypt (1952-1970). Extensive evidence is being examined in order to depict both quantitatively and qualitatively, such factors as income distributional shifts in both urban and rural sectors; shifts in social composition and stratification as generated by land reforms, industrialisation and the expansion of the public sector; and the pattern of domestic terms of trade and problems of urban/rural resource transfers.

63. Questions examined in this period included changes in the agrarian structure, the process of the differentiation of the peasantry, movement of rural wages, the shifts in the distribution of agricultural income by different socio-economic groups.

64. Work is still in progress on the rural sector, and it is hoped that the research results on the rural sector will be published as an Occasional Paper in 1975.

65. During the year Dr. Abdel-Fadil attended the conference organised jointly by the International Bank for Reconstruction and Development and the Institute of Development Studies on, 'Planning for Income Redistribution with Growth' held at the University of Sussex. He also attended the Conference of the U.K.-based Development Economists held at the University of East Anglia and spoke at a symposium on 'Development Problems and Strategies in the Middle East' in Beirut.

VARIATIONS IN TRADE UNION ORGANISATION AMONG WHITE-COLLAR WORKERS

66. This project, carried out by Dr. R.M. Blackburn, Dr. K. Prandy and Mr. A. Stewart, was started in October 1967. The work is now substantially completed. A monograph is in preparation. The following articles were published during the year:

'Measuring the Class Structure' by A. Stewart, K. Prandy and R.M. Blackburn.

'Concepts and Measures; the Example of Unionateness' by K. Prandy, A. Stewart and R.M. Blackburn.

DEPRIVATION, WORK EXPERIENCE, AND THE LEGITIMATION
OF AUTHORITY

67. This project began on 1 January 1973 and is being carried out by Dr. K. Prandy. It is primarily exploratory work to determine the feasibility of developing adequate measures and methods of analysis for the study of attitudes towards and beliefs about questions of authority and reward-distribution. In particular, it is hoped to study the relationships between these and the individual's work experience.

68. Some re-analysis of earlier work in this field has been carried out, and the analysis of newly collected data has now begun.

SOCIAL AND INDUSTRIAL DETERMINANTS OF WORKERS' ATTITUDES

69. The aims and methods of this project, which began in October 1968, were described in earlier Reports. The project is being carried out by Dr. R.M. Blackburn and Dr. J.M. Mann, Senior Lecturer in Sociology at the University of Essex. The findings are being prepared for publication.

70. Two papers on workers' orientations, one by Dr. M. Mann and one by Dr. R.M. Blackburn, were presented at meetings of the British Sociological Association Industrial Sociology section.

SOME ECONOMIC AND SOCIAL IMPLICATIONS OF IMMIGRATION TO BRITAIN;

see para. 23

SOCIAL STATUS IN GREAT BRITAIN

71. An outline of this project appeared in the Eleventh Report. Department staff engaged on it are Dr. R.M. Blackburn and Mr. A. Stewart, and associated with the research are Professor J.A. Banks and Mr. D. Webb, University of Leicester, Mr. K. Dixon, University of York, Mr. D. Donald, Glasgow College of Technology, Mr. M. Green and Mr. J. Scott, University of Strathclyde.

72. The first part of the project was a re-analysis of data gathered on two other Departmental projects, 'Variation in trade union organization among white-collar workers', and 'Social and industrial determinants of workers' attitudes.' A scale of social stratification was established and used in both projects. Dr. K. Prandy collaborated in this part of the research. An outline of the scale was included in 'Measuring the Class Structure', published in Nature, 26 October 1973.

73. The fieldwork for the second part of the research, comprising about 6,000 interviews in four centres (Glasgow, Leicester, York and Cambridge) was completed. This is now being analysed.

ELITES IN THE BRITISH CLASS STRUCTURE

74. This project, described in previous reports, has been carried out by Dr. A. Giddens and Mr. P. Stanworth. Mr. M. Hughes has been closely involved in the computer processing of collected data.

75. The principal concern during the final year of the project has been to conclude the collection of data and finalise the analysis of material. A number of articles which summarise the main conclusions of the project have been completed or published in the last year. In addition to those cited in the Thirteenth Report, the following articles have been completed or are in preparation.

'The modern corporate economy: interlocking directorships in Britain 1906-70' by P. Stanworth and A. Giddens.

'A British economic elite: directors of large British corporations 1900-70' by P. Stanworth and A. Giddens.

'British judges 1900-70' by P. Stanworth (in preparation).

(C) PROGRAMMING

76. In this year, after the re-programming for the new computer, the computing unit was reduced in size, Dr. J.M. Wheeler and Mr. G. Rendle both left and were not replaced. Also, the data processing staff was reduced from five to three. These economies produced an increased work load for the remaining staff so that the overall cost of the unit was kept at about the same level despite inflation. As usual, almost every project in the Department made use of the services of the computing unit, and the Growth Project was once again one of the main users.

77. The programming of a set of auto-regressive programs which had been started by Dr. M.H. Pesaran was continued by Dr. Slater after his departure from Cambridge, and the resulting system of four programs, AR, ARMA, DL1, and DL2, was widely used.

78. The program VERS was written for the Sociology unit and the work on Dr. Blackburn's survey on Social Status was started.

79. A first draft for a projected Occasional Paper on the Gem System was produced and new manuals prepared for all the systems after the transfer from Titan had been completed.

(D) NEW RESEARCH PROJECTS

80. The following new research projects were planned to begin in 1974-75, the principal investigators being given in brackets.

Social Inequality (Dr. R.M. Blackburn, Dr. K. Prandy, Mr. A. Stewart).

Behaviour of the Mexican Economy (Dr. M.J. Ellman).

II. PUBLICATIONS

MONOGRAPH SERIES.

81. This series, which is published by Cambridge University Press, contains reports of investigations which have been carried out by members of the Department's research staff and others directly collaborating in its work. The following appeared 1973-74:

No. 23 The Economic Impact of the Patent System, by C.T. TAYLOR and Z.A. SILBERSTON.

Forthcoming titles include:

Technological Diffusion and the Computer Revolution - the U.K. Experience, by R. STONEMAN.

OCCASIONAL PAPERS.

82. This series, published for the Department by the Cambridge University Press, is designed primarily for the rapid publication of research results which have topical interest. The following titles were added to those listed in previous Reports.

No. 33 Production Conditions in Indian Agriculture: a study based on Farm Management Surveys, by KRISHNA BHARADWAJ. (published November 1974).

No. 41 Exporting Workers: The Turkish case, by SUZANNE PAINE (published November 1974).

No. 42 The Steel Industry: International Comparisons of Industrial Structure and Performance, by A. COCKERILL in collaboration with A. SILBERSTON (published November 1974).

(The publication of the above titles was delayed owing to the introduction of the three-day week.)

Forthcoming titles include:

Company Finance and the Capital Market, by E.W. DAVIS and K.A. YEOMANS.

The Structure of Industry in the E.E.C., by KENNETH D. GEORGE and T.S. WARD.

Consumer Demand for Cars in the U.S.A., by R.P. SMITH.

Domestic Monetary Management in Britain 1919-38, by SUSAN HOWSON.

Development, Income Distribution and Social Change in Rural Egypt, by MAHMOUD ABDEL-FADIL.

A PROGRAMME FOR GROWTH

83. This series, published by Chapman and Hall Limited, describes the progress of work on economic growth undertaken at the Department under the direction of Professor Richard Stone. The final volume of the series appeared in May 1974.

No. 12 Structural Change in the British Economy 1948-1968.

CAMBRIDGE STUDIES IN SOCIOLOGY

84. This series (together with Cambridge Papers in Sociology) is published by Cambridge University Press under the auspices of the Committee of Management of the Department. It comprises Monographs and Collections of original articles on subjects of both theoretical and social interest based on the findings of empirical sociological investigations. The following publications appeared in 1973-74.

No. 8 Elites and power in British Society edited by PHILIP STANWORTH and ANTHONY GIDDENS

CAMBRIDGE PAPERS IN SOCIOLOGY

85. This series published by Cambridge University Press under the auspices of the Committee of Management of the Department, is intended to provide rapid publications of works which are between journal articles and Monographs in length, or important works based on more limited data than the Monographs. The following was published during 1973-74.

No. 4 Community and Occupation: an exploration of work/leisure relationships by GRAEME SALAMAN.

REPRINT SERIES

86. These are selected papers which members of the Department's research staff and others working in direct collaboration with the Department have contributed to learned journals and other publications. The following titles were added in 1973-74.

No. 393 'Reflation and the aftermath of financial pressure', by A.T.K. GRANT, Social Science Research Council Newsletter, No. 18, March 1973.

- No. 394 'Measuring the class structure', by A. STEWART, K. PRANDY and R.M. BLACKBURN, Nature Vol. 245, No. 5426, October 26, 1973.
- No. 395 'Political Economy of Socialist Development in China since 1949', by AJIT SINGH, Economic and Political Weekly, Vol. VIII, No. 47, November 24, 1973.
- No. 396 'Mr. Heath's road to ruin' and 'The Road to Recovery', by: NICHOLAS KALDOR, New Statesman, 22 February 1974 and 1 March 1974.
- No. 397 'A System of Social Matrices', by RICHARD STONE, The Review of Income and Wealth, Series 19, No. 2, June 1973.
- No. 398 'Dividend Behaviour and the Theory of the Firm', by MERVYN KING, Economica, Vol. 41, No. 161, February 1974.
- No. 399 'Pay Policy and Inflation: What Britain Thinks', by PATRICIA FOSH and DUDLEY JACKSON, New Society, 7 February, 1974.
- No. 400 'British Coalminers' Strike in Perspective' and 'Miners' by L.J. HANDY; 'Pay and Pit Wastage' by L.J. HANDY and K.J. COUTTS; 'Threshold Agreements' by L.J. HANDY, Economic and Political Weekly, March 4, 1972; New Society, 29 November, 1973; 17 January 1974; 26 July 1973.
- No. 401 'A Dynamic inter-industry model of price determination - A test of the normal price hypothesis', by H. PESARAN, Quarterly Journal of Economic Research of the Institute for Economic Research, University of Teheran, Vol. IX, Summer and Autumn 1972, Nos. 27 and 28.
- No. 402 'Wage Policy and Industrial Relations in India: A Reappraisal', by L.J. HANDY and T.S. PAPOLA, The Economic Journal, March 1974, Vol. 84.
- No. 403 'Economies of Scale and the Structure of the Steel Industry' by ANTHONY COCKERILL, The Business Economist, Sprint 1974, Vol. 6, No. 1.
- No. 404 'The Determinants of United Kingdom Import Prices', by G.E.J. LLEWELLYN, The Economic Journal, Vol. 84, March 1974.
- No. 405 'United Kingdom Exports and the Pressure of Demand: A Note', by L. ALAN WINTERS, The Economic Journal, Vol. 84, No. 335, September 1974.
- No. 406 'A Reconsideration of the empirical implications of Additive preferences', by ANGUS DEATON, The Economic Journal, Vol. 84, No. 334, June 1974.
- No. 407 'Taxation and the Cost of Capital', by MERVYN A. KING, The Review of Economic Studies, Vol. XLI, (1), January 1974.

- No. 408 'Exact maximum likelihood estimation of a regression equation with a first-order moving-average error', by M.H. PESARAN, The Review of Economic Studies, Vol. XL (4), October 1973.
- No. 409 'Shipping Conferences: Some economic aspects of international regulation', by B.M. DEAKIN, Maritime Studies and Management, Vol. 2, No. 1, July 1974.
- No. 410 'Concepts and Measures: the example of Unionateness', by K. PRANDY, A. STEWART and R.M. BLACKBURN, Sociology, Vol. 8, No. 3, September 1974.
- No. 411 'The Role of Capital in the Industrial Revolution', by PHYLLIS DEANE, Explorations in Economic History, Vol. 10, No. 4, Summer 1973.
- No. 412 'On the General Problem of Model Selection' by M.H. PESARAN, Review of Economic Studies, Vol. XLI (2), No. 126, April 1974.

III. OTHER ACTIVITIES

SEMINARS

87. During the year seven research papers have been read at seminars held under the joint auspices of the Department and the Faculty of Economics and Politics.

88. Ten papers were given in the series of seminars on Mathematical Economics and Econometrics.

UNIVERSITY RELATIONSHIPS

89. Several teaching officers in the Faculty of Economics and Politics have directed or otherwise taken part in the research projects carried out by the Department. Members of the Department's staff have given lectures or taken classes for the Economics Faculty, and for the Social and Political Sciences Committee, and nearly all of them are engaged in undergraduate and postgraduate teaching. The Department provided Faculty teaching officers with secretarial, statistical and computing assistance, as well as advice on electronic programming and data analysis. It also assisted research students attached to the Faculty.

90. Several of the Department's research staff are members of University committees, including the Faculty Board of Economics and Politics, and the Social and Political Sciences Committee.

RELATIONSHIPS WITH OTHER BODIES

91. Financial assistance received by the Department is dealt with in Section IV. Help of other kinds has come from many sources, including the Central Statistical Office, H.M. Treasury, the Overseas Development Administration, the Department of Trade and Industry, the Social Science Research Council, the Bank of England, the Esme Fairbairn Charitable Trust, the Ford Foundation, and a large number of industrial, shipping and business firms, trade and professional associations, and trade unions.

VISITORS

92. The following visiting economists and sociologists have worked in the Department during the year under review:

Professor M. Daub, Queen's University, Kingston, Ontario

Mr. B.D. Haig, The Australian National University, A.C.T.

Dr. N.R. Norman, University of Melbourne, Victoria, Australia

Mr. Supachai Panitchpakdi, National Bank of Thailand

Professor J.C. Sandesara, University of Bombay

Dr. E. Wolleb, National Institute of Research, Rome

IV. FINANCE

93. The Department's annual expenditure, which is mainly covered by outside grants, rose from £193,678 in 1972-73 to £204,427 in 1973-74. Eighty-six per cent of the expenditure was, as in 1972-73, on stipends, wages, and related payments.

94. The annual Grant which the University makes to the Department is not increased to take account of increased activities or higher costs generally. It is increased to allow for higher scales of stipends and wages but only to the extent of eleven-eightieths of the additional cost of a notional establishment based on that which existed in 1956. Accordingly the University grant rose from £67,641 in 1972-73 to £72,492 in 1973-74, an increase of £4,851. Expenditure on the other hand rose by £10,749.

95. The following are the principal new or additional payments by outside bodies which have been accepted during the year, for payment over various periods.

| | £ |
|---------------------------------|----------|
| Social Science Research Council | 108,600 |
| H.M. Treasury | 58,064 |
| Others | 46,814 |
| | <hr/> |
| TOTAL | £213,478 |

STAFF

Research Staff

96. The research staff employed during the year 1973-74 was as follows:

Director: W.A.H. Godley, M.A. (Cantab.), M.A. (Oxon.), Fellow of King's College

Assistant Director: C.T. Taylor, M.A. (Cantab.), M.A. (McGill), Fellow of Wolfson College

Special Appointment: Miss L.J. Slater, Sc.D., Ph.D. (Cantab.), D.Litt., Ph.D. (London), Head of Computing, Fellow of Lucy Cavendish College

Senior Research Officers: T.S. Barker, M.A., Ph.D. (Cantab.), M.A. (Edin.), Fellow of Downing College; R.M. Blackburn, M.A. (Cantab.), Ph.D. (Liverpool), Fellow of Clare College; B.M. Deakin, M.A. (Cantab.), M.A. (Oxon.), Fellow of Magdalene College; K. Prandy, M.A. (Cantab.), Ph.D. (Liverpool), B.Sc. (Econ.) (London), Fellow of Fitzwilliam College; A. Stewart, M.A. (Cantab.), B.Sc. (Econ.) (London); M.P. Ward, M.A. (Cantab.), B.A. (Exeter), Fellow of Selwyn College; V.H. Woodward, M.A. (Cantab.), B.A. (Nottingham).

Research Officers: M. Abdel-Fadil, B.Com. (Cairo), D.E.S., Ph.D. (Sorbonne); J.A. Beath, M.A. (St. Andrews), M.Phil. (London), M.A. (Penn.); Mrs. J.C. Craig, M.A. (Cantab.), B.Sc. (London); T.F. Cripps, B.A. (Cantab.); P.J. Daniel M.A. (Cantab.), M.A. (E. Anglia); A.S. Deaton, M.A., Ph.D. (Cantab.), Fellow of Fitzwilliam College; M.J. Ellman, M.A., Ph.D. (Cantab.), M.Sc. (Econ.) (London), Fellow of Fitzwilliam College; L.J. Handy, M.A. (Cantab.), B.A. (Leeds); D.A.S. Jackson, M.A. (Cantab.), M.A., B. Phil. (Oxon.), Fellow of St. Catharine's College; M.A. King, M.A. (Cantab.), Fellow of St. John's College; D.A. Livesey, M.A., Ph.D. (Cantab.), B.Sc. (Engineering) (London), Fellow of Emmanuel College; G.E.J. Llewellyn, M.A. (Cantab.), D.Phil. (Oxon.), B.A. (Hons.) (Victoria University of Wellington), Fellow of St. John's College; B.C. Moore, M.A. (Cantab.), M.Sc. (Econ.) (London); C.F. Pratten, M.A. (Cantab.), B.A. (Bristol), Fellow of Trinity Hall; J. Rhodes, M.A. (Cantab.), B.A. (Liverpool); P.H. Stanworth, M.A. (Leicester); R.J. Tarling, M.A. (Cantab.); T.S. Ward, M.A. (Cantab.), M.A. (Econ.) (Manchester), B.A. (Wales); S.F. Wilkinson, M.A. (Cantab.).

Junior Research Officers: K.J. Coutts, B.A. (Cantab.); M.J. Fetherston, B.A. (Cantab.); A.W.A. Peterson, M.A. (Cantab.), M.A. (Essex); G. Rendle, M.A. (Cantab.); L.A. Winters, B.Sc. (Bristol).

Research Fellow: Mrs. J.M. Wheeler, Ph.D. (Cantab.), B.Sc. (London).

97. The following, although not formally holding University posts in the Department were closely associated with the Department's research activities during the period under review:

A.G. Armstrong, M.A. (Cantab.), Lecturer in Economics, University of Bristol
P.E. Atkinson, B.A. (Cantab.)
M.P. Cowen, B.Sc. (London)
C.H. Feinstein, B. Comm. (Rand), Ph.D. (Cantab.), C.A. (S.A.), Fellow of Clare College, University Lecturer in Economics
K.D. George, M.A. (Cantab.), M.A. (Wales), Professor of Economics, University College, Cardiff

A. Giddens, M.A. (Cantab.), Fellow of King's College, University Lecturer in Sociology

A.N.E. Jolley, Ph.D., Lecturer in Economics, University of Melbourne
The Lord Kaldor, M.A. (Cantab.), B.Sc. (Econ.) (London), F.B.A., Fellow of King's College, Professor of Economics

M.L. Mackie, M.A. (Econ.) (Liverpool)

J.M. Mann, B.A., D.Phil. (Oxon.), Senior Lecturer in Sociology, University of Essex

R.R. Neild, M.A. (Cantab.), Fellow of Trinity College, Professor of Economics
D.M.G. Newbery, M.A. (Cantab.), F.B.A., Fellow of Churchill College, University Lecturer in Economics

W.D. Nordhaus, Professor of Economics, Yale University, U.S.A.

M.H. Pesaran, Ph.D. (Cantab.), B.A. (Salford)

W.B. Reddaway, C.B.E., M.A. (Cantab.), F.B.A., Fellow of Clare College, Professor of Political Economy

Z.A. Silberston, M.A. (Cantab.), Fellow of Nuffield College, Oxford

J.R.N. Stone, C.B.E., Sc.D., M.A. (Cantab.), F.B.A., Fellow of King's College, P.D. Leake Professor of Finance and Accounting

H.A. Turner, Ph.D. (Manchester), M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow of Churchill College, Montague Burton Professor of Industrial Relations

K.J. Wigley, M.A., Ph.D. (Cantab.), Fellow of Corpus Christi College, University Lecturer in Engineering

A.J.B. Wood, Ph.D., Assistant Lecturer in Economics, Fellow of King's College

J.P. Moyle, B.Sc. (Manchester)

A.T.K. Grant, C.B., C.M.G., M.A. (Cantab.), M.A. (Oxon.), Fellow of Pembroke College, Librarian-Secretary of the Faculty of Economics and Politics.

(Mr. Grant's name should have been included in the Thirteenth Report 1972-73. Mr. Grant retired from his post in September, 1973. We apologise for this omission.)

98. During the period covered by this Report the following members of the Research Staff left the Department to take posts in the places mentioned in brackets.

G. Rendle (London Transport)

C.T. Taylor (Bank of England)

Mrs. J.M. Wheeler (Dept. of Applied Mathematics & Theoretical Physics)

ASSISTANT STAFF

99. The following is a list of the assistant staff employed during the year 1973-74:

Mrs. M.J. Barnett; Mrs. P. Bentley; E.D. Bougourd; Miss O.M. Bye; Miss L. Chew; Miss M.V. Clark; Mrs. R. Coe; Miss S.L. Dawson; Miss D.M. Day; Miss T.C. Gurner; Miss V. Herman; Miss C.A. Hudson; Miss B.E. Hughes; M.J. Hughes; Mrs. M.R. Hughes; Mrs. J.M. Leverett; Mrs. A.L. Mills; Mrs. K. Ott; Mrs. N.P. Pegram; Mrs. O.E. Peppercorn; Miss S.D. Seal; Mrs. S. Sibson-Turnbull; Mrs. L.E. Sil; R.M. Smith; Mrs. T.J. Sparkes; Miss A.C. Twyman; Mrs. G.E. Wallman.