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UNIVERSITY OF CAMBRIDGE

DEPARTMENT OF APPLIED ECONOMICS

SEVENTH REPORT
ACTIVITIES IN THE PERIOD
OCTOBER 1966 TO SEPTEMBER 1967



March 1968



DEPARTMENT OF
APPLIED ECONOMICS

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UNIVERSITY OF CAMBRIDGE DEPARTMENT OF APPLIED ECONOMICS

Director

W.B. REDDAWAY
(on sabbatical leave 1966-67)

Acting Director

A. SILBERSTON

Committee of Management, September 1967

Professor E.A.G. ROBINSON (Chairman)

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Miss P.M. DEANE	J.R.S. REVELL
C.H. FEINSTEIN	A. SILBERSTON
J.H. GOLDTHORPE	Professor RICHARD STONE
Professor H.A. TURNER	

Secretary

H. LOSHAK

Mrs D.E. WEDDERBURN was also a member of the Committee of Management during part of the period covered in this Report.

SEVENTH REPORT OF THE DEPARTMENT OF APPLIED ECONOMICS

(covering the year October 1966 to September 1967)

I. GENERAL

1. The Department's permitted staff remains as set out in the Sixth Report. The actual staff at the time (December 1967) this Report was prepared was as follows, the figures in brackets being those in December 1966: the Director (1), one Special Appointment (1), four Senior Research Officers (5), seventeen Research Officers (16), eight Junior Research Officers (6), four research consultants (4), three visiting members (4), fourteen research associates who are teaching officers of the Faculty of Economics and Politics actively associated with research projects within the Department (14), one junior research associate (0), and twenty-five full-time assistants (25).

2. The research activities of the Department continue to grow, especially in sociological research, in which field two new major projects have recently begun.

II. FINANCE

3. The Department's annual expenditure has risen from £89,303 in 1965-66 to £96,777 in 1966-67. Almost 90 per cent. of the 1966-67 expenditure was on stipends, wages, and related payments.

4. As explained in the Sixth Report, the annual grant which the University makes to the Department is not increased to take account of increased activities or higher costs. 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. The University grant rose from £41,400 in 1965-66 to £43,183 in 1966-67, an increase of £1,783, while expenditure rose by £7,474.

5. The University grant was equal to only 45 per cent. of the Department's expenditure during the year, as against 47 per cent. in 1965-66. The importance of support from outside bodies for the research activities of the Department is apparent.

6. The following are the principal new payments by outside bodies which have been accepted during the year, for payment over various periods, in most cases as grants in support of specific projects, but in some cases as donations to the Department's Research Account (which can be used for a wide range of purposes, not necessarily connected with any specified project):

	£
Social Science Research Council	126,367
National Economic Development Office	8,625
Bank of England	7,500
National Science Foundation (U.S.A.)	4,165
Ministry of Overseas Development	3,495
Other donors	1,698
TOTAL	£151,850

The large size of the total outside finance promised is a testimony to the high esteem in which the work of the Department is held, but is unlikely to be repeated in any future year. The Social Science Research Council figure includes an exceptional item of £58,311 to cover a project organized by Professor Richard Stone for a period of two and a quarter years.

III. RESEARCH ACTIVITIES

(a) Economics and Economic History

Empirical Models of Economic Growth

7. Work on this project, under the direction of Professor Stone, has continued along lines described in previous Reports and presented in vols. 1-7 in the series entitled *A Programme for Growth* (London: Chapman and Hall).

8. The research staff engaged with Professor Stone on the project during the period covered by this Report is as follows: Mr A.G. Armstrong, Mr T.S. Barker, Mr M.J. Green, Mr O.T. Hooker, Mr J.R.C. Lecomber, Mr C.S. Leicester, Dr L.J. Slater, and Mr K.J. Wigley. Mr A.C. Kevin has been seconded to the project by the International Copper Development Council as from 1 October 1966. During the period some of the visitors to the Department, and others, have been associated with the project, namely: Mr C.J. Aberg, Dr G. Bager, Professor P.R. Brandao, Professor D.J. Clough, Mr J.D. Kies, Mr Z. Novotny, Dr J. Stahan, and Mrs Z. Ujlaki.

9. Development of the models employed has taken a number of different routes. The treatment of foreign trade is described separately in paragraph 11 below. The revisions to the social accounting matrices for 1954, 1960, and 1963 referred to in the previous Reports are now complete. In addition an accounting matrix for 1960 has been constructed linking the real and the financial statistics of the project; a similar matrix is under construction for 1963. Projections of fuel supply and demand patterns have been prepared and are presented in vol. 8 of *A Programme for Growth* (to be published). The methods employed in obtaining these projections take account of movements in relative fuel prices and the introduction of natural gas. Detailed statistical work for other industrial sectors has continued, particularly for engineering and the metal trades. Iterative parameter fitting procedures have been tested for the linear expenditure system as applied to consumers' expenditure data and alternative non-linear models have been developed. Some analysis has been made of short-term stock adjustment models with a view to incorporating the study of fluctuations within the scope of the project. Preliminary results in the fields of manpower planning and demographic analysis have been obtained and presented at a number of conference meetings. These results are either published or are in editorial preparation.

10. The following papers have appeared since the previous Report:

'The Social Accounts from a Consumer's Point of View: an Outline and Discussion of the revised United Nations System of National Accounts', by Richard Stone (*The Review of Income and Wealth*, no. 1, 1966; Reprint no. 261).

'Our Unstable Economy: Can Planning Succeed? Sixth Annual Lecture of the U.K. Automation Council', by Richard Stone (*The Journal of the Institution of Electrical Engineers*, vol. 13, February 1967, and *Control*, vol. 11, no. 104, February 1967; Reprint no. 264).

'Official Statistics: a Golden Treasury or a Working Tool?', by Richard Stone (included in the *Fourth Report from the Estimates Committee*, House of Commons Paper 246, 1966).

'A Programming Language for Linear Algebra', by H.T. Burley (*The Computer Journal*, vol. 10, no. 1, May 1967; Reprint no. 270).

'The Motor Industry and the British Economy', by A.G. Armstrong (*District Bank Review*, September 1967).

Fortran Programs for Economists, by Lucy J. Slater (Occasional Paper, no. 13, 1967).

Future Imports and Exports

11. Mr J.R.C. Lecomber and Mr T.S. Barker, at the suggestion of the National Ports Council, began work in 1966 on forecasting imports and exports in considerable commodity detail. The project, under the general direction of Professor Richard Stone, is closely linked with that on Empirical Models of Economic Growth (see above), and the forecasts were prepared by using an adaptation of the input-output model constructed by that project. The original model was extended to incorporate some eighty relationships for determining import groups in terms of relative prices, categories of demand, and other variables. At the same time exports were related to prices, and prices to the general level of home costs. The model allows investigation of alternative methods of achieving a satisfactory balance of payments. A special programme for solving the model, using the University's Titan computer, has been written. Import relationships were estimated by regression methods, using annual price and volume series built up from the Annual Statement of Trade.

12. First results of the study, together with an account of methodology are included in a report (*British Imports 1972*, by T.S. Barker and J.R.C. Lecomber) made to the National Ports Council in 1967. Further results are to be published in the *Programme for Growth* series. Work on exports, using matrices cross-classified by commodity and destination, is under way.

Financial Aspects of British Economic Growth

13. The main effort on this project has continued to be given to the preparation of the social accounting framework. The first tentative set of figures for integrated social accounts on the model proposed to the United Nations by Professor Stone for the revision of the System of National Accounts has been brought together for the year 1963. Work will still be needed on refining the estimates to remove discrepancies revealed by the internal checks of the system, but in the meantime the statistical information needed to produce national balance sheets for later years is being collected. An additional grant for this side of the work is in prospect, and it is hoped to produce a national balance sheet for 1964 and 1965 by the end of 1968. The monograph on national balance sheets by Mr Revell was published in September 1967.

14. Exploratory studies on various aspects of the financial behaviour of the personal sector have continued, and some progress has been made in collecting detailed monthly statistics from some of the larger building societies. A great deal of work has been done on a detailed study of the operation of various types of financial institution and of the working of the financial system in the light of recent changes.

15. The research staff working under Professor Stone on the project have been Mr J.R.S. Revell, Mr D.R. Gray (who left for another appointment in September 1967), Mr G.E.A. Kentfield (who was seconded by the Bank of England for one year until September 1967), Mr J.P. Moyle, and Mr F.E. Townson.

The following book was published during the year:

The Wealth of the Nation: The National Balance Sheet of the United Kingdom, 1957-1961, by Jack Revell, assisted by Graham Hockley and John Moyle (Department of Applied Economics Monograph, no. 14)

The Growth of Public Companies and its Finance

16. The inception, aims, and progress until 1966, of this project were described in the Fifth and Sixth Reports. During 1966-67 most of the work on the project has been directed towards completing Occasional Paper no. 7, entitled *Growth, Profitability and Valuation. A Study of U.K. Quoted Companies*, by A. Singh and G. Whittington in collaboration with H.T. Burley, which is to be published in January 1968. It is more ambitious in scope and more rigorous in technique than was originally intended. Mr Singh and Mr Whittington have, as the authors, been the most directly involved in the work, but they have again received valuable programming assistance from Mr Burley, and Mr Reddaway has co-operated very closely in revising the manuscript of the book.

The Economics of Developing Countries

17. In 1964 the Ministry of Overseas Development (then the Department of Technical Co-operation) agreed to provide up to £9,000 a year to enable the Department to appoint three research workers to study the economic problems of developing countries. In return, the Department agreed to make three research workers available when required to meet requests received by the Ministry to work in overseas countries. Since the inception of this project the three holders of the posts, Mr E. Bemathan, Dr A.R. Jolly, and Mr M.P. Ward, have spent just over half their time working abroad in Asia, Africa or the Middle East, and the rest of their time on individual research projects within the Department.

18. Mr Bennathan completed his part in the study of 'Some Aspects of the Finance of Development', published as chapters 1 and 2 of *United Nations Economic Survey of Asia and the Far East 1966*. He has continued his study of ocean transport in its relation to the structure of Asian trade, and the prospects for regional import substitution and development. He returned from Bangkok in April 1967, and is at present co-ordinating the writing up of interim reports by four Asian working groups. In collaboration with Professor A.A. Walters he has completed an expanded version of a paper on 'The Economics of Ocean Freight Rates', presented to U.N.C.T.A.D. Shipping Seminar, August 1966. Mr Bennathan was a rapporteur at the Ninth World Congress of the Society for International Development, and took part in the Fabian Study Group on Liquidity, as well as in the R.I.I.A. Study Group on UNCTAD II.

19. Since returning from secondment to Zambia, Dr Jolly has continued work on education and manpower in developing countries, with the aim of producing a monograph on manpower

planning during the coming year. An article, 'Educational Planning in Zambia', appeared in *The World Year Book of Education*, 1967 (Reprint no. 268). He has published a book, *Planning Education for African Development*, East African Publishing House, 1967. Under the arrangement with the Ministry of Overseas Development Dr Jolly went on two technical assistance missions to the Middle East during the year, the first to advise on the economic development of Abu Dhabi, the second to advise on a manpower survey in Bahrain. Reports of both these missions have been made to the Governments of the countries concerned. Dr Jolly has also visited East and Central Africa in connexion with a training course on manpower and educational planning which he is to conduct in March 1968 at the Institute of Development Studies at the University of Sussex.

20. Mr Ward was seconded to the Bureau of Statistics in Maseru, Lesotho, from August 1966 until January 1967, during which period he set up a national accounts system for the country. As a result of his visit the first set of national accounts for Lesotho was published in 1967. An article by him on economic development in Lesotho, drawing upon these data, is to be published in *The Journal of Modern African Studies* in 1968. In September 1967 Mr Ward was seconded to Fiji, where he will be Government Statistician for two years.

The Effects of United Kingdom Direct Investment Overseas

21. The interim report on this project, which was forecast in the Sixth Report, appeared in March 1967 as Occasional Paper no. 12: *Effects of U.K. Direct Investment Overseas. An Interim Report*, by W.B. Reddaway in collaboration with J.O.N. Perkins, S.J. Potter, and C.T. Taylor. It was widely noticed in the business press and in weekly journals. Most commentators welcomed it as filling a notable gap in economic knowledge, and providing a useful framework for considering the policy issues in a more rigorous fashion than has hitherto been possible. ('Overseas Investment: A Reply', by S.J. Potter and C.T. Taylor, has appeared in *Westminster Bank Review*, November 1967, in answer to one critical article.)

22. Under the direction of Mr Reddaway work on the project has continued, with the aim of producing a final report in 1968. This will be a sequel, rather than a successor, to the Interim Report, for it proved possible, in the event, to include more information and analysis in the Interim Report than had been anticipated even in the advanced stages of its preparation. The final report will extend the examination of balance of payments effects to include plantations, and to cover the mining and manufacturing fields more fully. It had been hoped to assess the effects of overseas investment by the major U.K. oil companies and the Department made great efforts to show how it would be possible to develop an 'alternative position' applicable to the oil company case. However, the oil companies declared themselves unable to provide realistic figures for this phase of the inquiry, and oil remains an unfortunate gap in the total picture.

23. The final report will also consider the chief ways in which direct investment overseas affects the U.K. domestic economy, a subject which was not elaborated in the Interim Report. In particular, it is planned to present some quantitative information on the gains to U.K. operations obtained through technical and commercial 'feedback' from overseas subsidiaries, and something will be said about other benefits claimed to arise as a result of the 'international' character of companies that invest large amounts overseas.

24. Mr S.J. Potter and Mr C.T. Taylor continued to work on the project. Dr J.O.N. Perkins, after having worked for six months on the Interim Report, returned to the University of Melbourne at the end of 1966.

25. Contributions have been made by the research team to seminars and conferences in Cambridge and elsewhere.

Current Economic Assessments

26. The London and Cambridge Economic Service continued to publish its quarterly *Bulletin* in *The Times*. During the year under review three issues were devoted to assessments of the economic position of the United Kingdom, and one—written by Professors Reder and Tarshis of Stanford University—to the state of the U.S. economy. The Department provided the statistical and secretarial assistance required by the Service. Dr C.H. Feinstein and Mr S.J. Potter continued a secretary and statistician respectively.

Capital Formation and the Stock of Assets in Britain, 1830-1960

27. The object of this inquiry is to explore some of the relationships between capital formation and economic growth in Britain since the beginning of the railway age. It has involved producing new annual estimates of capital formation and stock, of gross national product for the period 1830-1914, and of the distribution of the labour force derived from an analysis of the nineteenth-century occupation censuses. These new estimates are largely complete and it is hoped to publish the main statistical results in summary form in 1968. Miss P.M. Deane, who is in charge of the inquiry, is undertaking its completion and will be writing up the results in collaboration with Miss B.A. Mercer, Mr M.P. Ward, and Dr B.R. Mitchell. It is planned to publish the analytical results in the form of a monograph.

Economies of Large-scale Production

28. Mr C.F. Pratten has almost completed the research on this topic. It is intended to publish the results in a book describing the economies of scale in a wide selection of manufacturing industries. The estimates of economies of scale for individual industries are based both on published studies and on information obtained from companies engaged in those industries. The volume will also contain sections discussing the use of company accounts and census of production data for the estimation of economies of scale, and a discussion of how far the research enables generalizations to be made about the scope for, and the relative importance of, economies of large-scale production in British industry.

29. During the period under review Mr Pratten and Mr A. Silberston also completed a study of the rubber industry for the National Economic Development Office. *Optimum Scale in the Production of General Rubber Goods* was published by N.E.D.O. in May 1967.

30. Another piece of research in this field, also for N.E.D.O., was carried out by Miss T. Seward on behalf of the Sub-committee on the Utilization of Plant of the Economic Development Committee for Newspapers, Printing, and Publishing. The results of Miss Seward's investigation are to be published by N.E.D.O. as a final report on the pilot survey on plant utilization in the printing industry.

Economic Impact of the British Patent System

31. As forecast in the Sixth Report, *The British Patent System*, by Klaus Boehm in collaboration with Aubrey Silberston, has been published, in the Department's Monograph series, by the Cambridge University Press. An article, 'The Patent System', by Aubrey Silberston, appeared in *Lloyds Bank Review*, April 1967.

32. With the help of a grant from the Social Science Research Council work has begun on a second volume which will be concerned with the economic impact of the patent system. In addition to case studies of individual industries, including chemicals, electronics, pharmaceuticals, and oil refining, it will contain an appraisal of the economic effects of the British Patent System, together with any proposals for changes in the system which the investigation might suggest. Under the direction of Mr A. Silberston, the research is being carried out by Mr C.T. Taylor, who will be joined in January 1968 by Miss J.M.P. Bradley.

Analysis of Patent Statistics

33. Dr B.R. Mitchell and Mr J.P.P. Higgins are carrying out, under the direction of Mr A. Silberston, the historical study of the patent statistics of the last hundred years, which was referred to in paragraph 38 of the Sixth Report. This has taken the form of an investigation into the relationships between patent statistics, classified by industry, and other economic variables, within the period 1853 to 1938. The collection and analysis of data has been concentrated on particular industries, namely, agriculture, coal, paper and printing, railways, and textiles.

34. The study will also contain a broad analysis of a wider range of industries, and will include inter-industry and international comparisons between the results of the inquiry and those suggested by similar work carried out elsewhere, particularly in the United States. The Social Science Research Council has made a grant in support of this project.

Productivity in Distribution

35. Over the past year the detailed research work on this project has been carried out by Mr P.V.Hills with assistance from Mr C.F.Pratten, Mr C.T.Taylor, and Mr S.J.Potter. Mr K.D.George has been in charge of the project, with Mr W.B.Reddaway exercising more general supervision of it.

36. As forecast in the Sixth Report, the research since September 1966 has been concentrated on the role of investment in increasing productivity in the retail trades. Information has been obtained by means of a questionnaire which has been sent to leading retail companies. More specifically, the basic objectives of the inquiry have been: (a) to assess the importance of capital expenditure in increasing productivity in retailing by collecting information on the relationships concerned for firms and for individual investment projects; (b) to discover the major obstacles to increasing investment, e.g. shortage of finance, difficulties with regard to planning permission, etc.; (c) in relation to (b) to inquire what have been the effects of fiscal investment incentives on capital expenditure in retailing.

37. A report on the inquiry is to be handed to the Economic Development Committee for the Distributive Trades early in 1968.

Capital, Employment, Output, Productivity, and Technical Change in Transport and Communication

38. This research was started in April 1965 as a development of an earlier project on productivity measurement in the Service Industries in the United Kingdom. The work is being undertaken by Mr B.M.Deakin and Miss T.Seward under the general direction of Mr W.B.Reddaway. The main objective of the project is to investigate post-war trends in employment, capital, output, quality of output, capacity utilization, productivity and technical change in passenger and freight transport in Great Britain. An interpretation of the results of the analytical part of the study is made by fitting a production function and by applying a measure of output per unit of total factor input. A number of explanatory hypotheses are tested. The results are now being written up with a view to publication in the Occasional Paper series of the Department.

Nationalized Industries

39. This project started in 1964 as a study of the investment policies of nationalized industries. However, it became clear that many general questions about their performance, and the economic and financial criteria by which they should operate, had not yet been answered. Mr R.W.S.Pryke has therefore made a survey, containing a large amount of new statistical material, covering such topics as the development of the nationalized industries' output; the amount and quality of their investment; their productivity and how it compares with that of the same industries in other countries; the cause and extent of the rise in their prices; and their profits and financing.

40. A general survey of the economic and financial rules for public enterprise has also been prepared, and case studies have been made of B.R.S. Parcels and of the West Midlands Gas Board. It is hoped that these and other studies will be published in a book of essays on public enterprise.

(b) Industrial Relations and Sociology

The Causes of Small Strikes

41. This study, which was conducted by Dr G.Clack under Professor Turner's direction, has contributed to several publications which were cited or forecast in last year's Report. It is anticipated that a final paper, commenting on the trend and significance of post-war British strike movements in general, will ultimately appear.

Job Evaluation

42. The aim of this project is an assessment of the possible use of job evaluation techniques for national wage and incomes policy. Dr G.Clack left the Department in September 1967 and the study is at present being carried forward by Mr Michael Fores under Professor H.A.Turner's supervision.

43. Since the reference in the last Annual Report, a survey has been made—largely through two questionnaires—of the practice, experience, and attitudes of some 300 large firms. The national

system of job evaluation established as part of centralized wage and incomes policy in the Netherlands has been studied by discussions and the collection of material in Holland. The wage structures of a number of large British companies which use job evaluation techniques have also been submitted to a statistical analysis, with promising results from the point of view of the derivation of implied principles in the actual wage and salary hierarchies of companies.

44. Since last year the whole question of the use of job evaluation techniques in British industry has been referred by the Government to the National Board for Prices and Incomes. Data derived from the Cambridge study has been supplied to the Board in this connexion, and the Department is co-operating with the Board's officers in their own investigation.

Demarcation Rules and Related Practices

45. This study began in 1964, and has been undertaken by Mr G.Roberts under Professor Turner's direction.

46. Last year's Report referred to the work which had already been done on trade union rules, collective agreements, and workplace arrangements affecting the allocation of work between operatives of different skills in shipbuilding and ship repairing. A report on this aspect of the study was submitted to the Royal Commission on Trade Unions and Employers Associations at that body's request, and a preliminary survey of the study's results is contained in an Occasional Paper, no. 14: *Demarcation Rules in Shipbuilding and Shiprepairing* by Mr Roberts.

47. Since last year's Report, studies of demarcation practice and disputes in the printing, building, and engineering industries have been completed. A further study has also been made of the effect of the arrangements provided by collective agreement in the metal-working industries for control over the substitution of skilled by less skilled labour. Publication of the results of the project as a whole will follow in due course.

Labour Relations in Mining

48. The objects of this inquiry, which is being conducted by Mr L.J.Handy under the direction of Professor H.A.Turner, were outlined in the Sixth Report of the Department (p. 12, paragraphs 50-1).

49. The analysis of the coal-mining wages structure is now well advanced. Particular attention has been given to the impact of economic and technological factors on the wages structure and wage movements during the post-war period.

50. Recently, a questionnaire was sent to National Union of Mineworkers lodge secretaries to supplement statistical material already collected on various aspects of collective bargaining in the industry.

51. An article by Mr Handy, 'Absenteeism and Attendance in the British Coal-Mining Industry: an analysis of post-war trends', will appear in the *British Journal of Industrial Relations* in March 1968.

Conditions of Employment of Manual and Non-manual Workers

52. The Fifth and Sixth Reports describe the aims and early progress of this inquiry. In November 1966 the Social Science Research Council extended their grant for the project by two years beyond its original finishing date (December 1966) to enable a large-scale study to be made of the differences in the terms and conditions of employment of manual and non-manual workers in a sample of firms, mainly in manufacturing industry. This collecting of data, by postal questionnaire, had been envisaged in the original research programme, but the wealth of material produced by the case studies which were first undertaken had delayed the inquiry by questionnaire.

53. Because of illness Mrs J.C.Craig has so far made little progress in the investigation, and the grant was suspended for part of the year. She is now making preparations for a pilot survey. Mrs D.E.Wedderburn, who directs the project, jointly with Dr R.M.Blackburn, read a paper on 'Staff Status—Its Meaning and Problems' to the National Conference of the Institute of Personnel Management at Harrogate in 1966.

Relationship between Technology and Attitudes to Employment

54. Material originally collected as part of the case-studies carried out in connexion with the project on Conditions of Employment of Manual and Non-manual Workers (see above) suggested that it would be useful to test the hypothesis that differences of attitudes between groups of workers employed in plants utilizing different technologies, but operating on the same site and for the same employer, largely depended on the control systems related to the technologies. With the help of a nine-month grant from the Social Science Research Council Mrs R. Crompton, under the general direction of Mrs D. E. Wedderburn, collected further data. Their report on the research is in first draft. A chapter is to be contributed to a collection of essays on Technology, Management Control and Organizational Behaviour, edited by Joan Woodward. It is possible that a volume in the Department's Occasional Paper series may also be produced.

Attitudes to Work in Relation to Production Systems and Community Structure: The New Working Class

55. *The Affluent Worker: Industrial Attitudes and Behaviour* and *The Affluent Worker: Political Attitudes and Behaviour*, by J. H. Goldthorpe, David Lockwood, Frank Bechhöfer, and Jennifer Platt, the two monographs referred to in the Sixth Report, are complete and will shortly be published by the Cambridge University Press in the new *Cambridge Studies in Sociology* series. A further monograph resulting from this research project, *The Affluent Worker in the Class Structure*, is in preparation.

A Comparative Study of Factory Organizations

56. This project, which began in June 1967, is a cross-national comparative study and is being conducted by teams in Britain, France, Germany, and Italy. There will probably also be an American team at a later stage. Dr R. M. Blackburn and Mr J. H. Goldthorpe direct the British investigation, while Mr J. M. Mann is carrying out much of the research work. The aim is to analyse the causes of similarities and differences in the social structure of factories in different social environments. During the first six months each team is preparing a theoretical paper on this subject, and an outline of relevant information relating to its own country. These papers will form the basis for an agreed design for the stage of empirical research to follow. Dr Blackburn, Mr Goldthorpe, and Mr Mann visited Royaumont, near Paris, in September to take part in the first meeting of all the teams engaged on the project.

New Research Projects

57. The following new research projects were planned to begin in October 1967, the principal investigators being given in brackets:

Growth and Fluctuations in the British Economy: Projections for Planning (Professor Richard Stone).

International Freight Transport and Shipping Conferences (Mr W. B. Reddaway and Mr B. M. Deakin).

Labour Problems in Under-developed Countries (Professor H. A. Turner and Mr D. A. S. Jackson).

Management Organization and Industrial Relations (Professor H. A. Turner and Mr G. Roberts).

Variations in Trade Union Organization among White-Collar Workers (Dr R. M. Blackburn and Dr K. Prandy).

IV. OTHER ACTIVITIES

Seminars

58. During the year under review eleven research papers, of which six were contributed by visiting economists, have been read at seminars held under the joint auspices of the Department and of the Faculty of Economics and Politics.

59. Nine papers were given in the series of seminars on Mathematical Economics and Econometrics. Visiting economists contributed five of these.

University Relationships

60. Many teaching officers of 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 Faculty, and nearly all of them supervise under-

graduates studying economics, economic history, or sociology. The Department has provided Faculty teaching officers with secretarial and computing assistance, as well as advice on electronic programming and data analysis. It has also assisted Research Students attached to the Faculty.

61. The University Mathematical Laboratory has continued to help the Department with much-valued computing facilities and advice.

Relationships with Other Bodies

62. Financial assistance which outside bodies have given the Department is dealt with in Section II. Help of other kinds has come from many sources, including the National Economic Development Office, the Central Statistical Office, the Ministry of Overseas Development, the Board of Trade, the Ministry of Labour, the Social Science Research Council, the Confederation of British Industry, the National Coal Board, the Bank of England, the Imperial Institute, and a large number of industrial and business firms, trade and professional associations, and trade unions.

Visitors from Abroad

63. The following economists from abroad have worked in the Department as visiting members during the year under review:

Mr C. J. Aberg of the University of Stockholm.

Dr G. Bager of the Institute of Economic Planning, Budapest.

Professor P. B. Brandao of the University of Bahia, Brazil.

Mr Z. Novotny of the Research Institute of Economic Planning, Prague.

Professor W. D. Shipman of Bowdoin College, Brunswick, U.S.A.

Dr J. Stahan of the Institute of Economics, Zagreb, Yugoslavia.

Mrs Z. Ujlaki of the National Planning Office, Budapest.

V. PUBLICATIONS

Monograph Series

64. This series, which is published by the 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 titles of the first twelve volumes were listed in previous Reports. The following two further volumes appeared during 1966-67:

No. 13. *The British Patent System: I. Administration*. By K. H. BOEHM in collaboration with AUBREY SILBERSTON.

No. 14. *The Wealth of the Nation: The National Balance Sheet of the United Kingdom, 1957-61*. By JACK REVELL, assisted by GRAHAM HOCKLEY and JOHN MOYLE.

Studies in the National Income and Expenditure of the United Kingdom

65. This series, published by the Cambridge University Press under the joint auspices of the Department and the National Institute of Economic and Social Research, contains the results of research undertaken in both institutions under the general direction of Professor Richard Stone. Seven volumes of the series have appeared and were listed in previous Reports. An eighth volume is nearing completion and will be published as:

National Income, Expenditure and Output of the United Kingdom, 1860-1960. By CHARLES FEINSTEIN (with a section by JOHN UTTING on the income and expenditure of public authorities, 1920-1938).

Occasional Papers

66. This series, published for the Department by the Cambridge University Press, is designed for the rapid publication of research results which have a topical interest. The following four titles were added in 1966-67 to the eight listed in previous Reports:

No. 9. *Industrial Relations in a British Car Factory*. By GARFIELD CLACK.

No. 11. *The Sterling Area, the Commonwealth and World Economic Growth*. By J. O. N. PERKINS.

No. 12. *Effects of U.K. Direct Investment Overseas. An Interim Report.* By W.B. REDDAWAY in collaboration with J.O.N. PERKINS, S.J. POTTER, and C.T. TAYLOR.

No. 13. *Fortran Programs for Economists.* By LUCY JOAN SLATER.

Forthcoming titles:

No. 7. *Growth, Profitability and Valuation. A Study of U.K. Quoted Companies.* By A. SINGH and G. WHITTINGTON in collaboration with H.T. BURLEY (to appear in January 1968).

No. 14. *Demarcation Rules in Shipbuilding and Shiprepairing.* By GEOFFREY ROBERTS (published in November 1967).

Effects of U.K. Direct Investment Overseas (Final Report). By W.B. REDDAWAY in collaboration with S.J. POTTER and C.T. TAYLOR.

A Programme for Growth

67. This series, published by Chapman and Hall Limited, describes the progress of the work on economic growth undertaken at the Department under the direction of Professor Richard Stone. No volumes were added in 1966-67 to the seven listed in previous Reports, but the following volume is expected to appear early in 1968:

Fuel and Power for the United Kingdom 1948-1975. By K.J. WIGLEY.

Cambridge Studies in Sociology

68. The first two volumes in this series of sociological studies, to be published, in both paperback and hard-cover form, by the Cambridge University Press, are expected to appear shortly. They are based on research done at the Department over the period from October 1962 to the present time, and are entitled:

The Affluent Worker: Industrial Attitudes and Behaviour. By J.H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

The Affluent Worker: Political Attitudes and Behaviour. By J.H. GOLDTHORPE, DAVID LOCKWOOD, FRANK BECHHOFFER, and JENNIFER PLATT.

Further volumes of this series are now being written.

Reprint Series

69. This series consists of 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. During the year the following ten titles, which are listed in alphabetical order of authors, have been added.

CLACK, GARFIELD. *Strikes and Dissatisfaction with Assembly-Line Work in Car Factories* (*Cambridge Opinion* 45, November 1966; Reprint no. 262).

GOLDTHORPE, JOHN H. *Attitudes and Behaviour of Car Assembly Workers: A Deviant Case and a Theoretical Critique* (*British Journal of Sociology*, vol. xvii, no. 3, September 1966; Reprint no. 260).

JOLLY, ARTHUR R. *Education Planning in Zambia* (*The World Year Book of Education*, 1967; Reprint no. 268).

LOCKWOOD, D. *Sources of Variation in Working Class Images of Society* (*Sociological Review*, November 1966; Reprint no. 269).

SILBERSTON, AUBREY. *The Patent System* (*Lloyds Bank Review*, April 1967; Reprint no. 266).

STONE, RICHARD. *The Social Accounts from a Consumer's Point of View* (*Review of Income and Wealth*, no. 1, March 1966; Reprint no. 261).

STONE, RICHARD. *National Income* (*Chambers Encyclopaedia*, 4th edition; Reprint no. 263).

STONE, RICHARD. *Our Unstable Economy: Can Planning Succeed?* (Sixth Annual Lecture of the United Kingdom Automation Council; Reprint no. 264).

STONE, RICHARD. *Spending and Saving in Relation to Income and Wealth.* Also FISHER, H. R. *A Unitary Interpretation of Professor Stone's Equations for Savings and Expenditure* (*L'Industria*, no. 4, October-December 1966; Reprint no. 265).

STONE, RICHARD and LEICESTER, COLIN. *The Methodology of Planning Models* (paper in *National Economic Planning: A Conference of the Universities—National Bureau Committee for Economic Research*, New York 1967; Reprint no. 267).

VI. STAFF

Research Staff

70. The research staff at September 1967 was as follows:

Director: Mr W.B. REDDAWAY, M.A. (Cantab.), F.B.A., Fellow of Clare College.

Special Appointment: Miss L.J. SLATER, Ph.D. (Cantab.), D.Litt., Ph.D., M.A. (London).

Senior Research Officers: Mr E. BENNATHAN, M.Com. (Birmingham), M.A. (Cantab.), Fellow of Jesus College; Mr R.M. BLACKBURN, M.A. (Cantab.), Ph.D. (Liverpool), Fellow of Clare College; Mr B.M. DEAKIN, M.A. (Cantab.), M.A. (Oxon.), Fellow of Magdalene College; Mr B.R. MITCHELL, Ph.D. (Cantab.), M.A. (Aberdeen), Fellow of Trinity College; Mr J.R.S. REVELL, M.A. (Cantab.), B.Sc. (Econ.) (London), Fellow and Tutor of Fitzwilliam College.

Research Officers: Mr H.T. BURLEY, B.Econ. (Adelaide); Mr G. CLACK, M.A. (Cantab.), Ph.D. (London), B.A. (Witwatersrand), B.Econ. (Natal); Mrs J.C. CRAIG, M.A. (Cantab.), B.Sc. (London); Mr D.R. GRAY, M.Sc. (Econ.) (London); Mr P.V. HILLS, B.Sc. (Econ.) (Southampton); Mr O.T. HOOKER, M.A. (Cantab.), B.Sc. (Econ.) (London); Mr A.R. JOLLY, M.A. (Cantab.), Ph.D. (Yale); Mr J.R.C. LECOMBER, B.A. (Oxon.), Research Fellow of Clare College; Mr C.S. LEICESTER, M.A. (Cantab.); Mr C.F. PRATTEN, B.A. (Bristol); Mr R.W.S. PRYKE, B.A. (Oxon.); Mr G. ROBERTS, M.A. (Econ.), B.A. (Comm.) (Manchester); Miss T. SEWARD, M.A. (Cantab.), B.Sc. (Econ.) (London); Mr M.P. WARD, M.A. (Cantab.), B.A. (Exeter), Fellow of Selwyn College; Mr G. WHITTINGTON, M.A. (Cantab.), B.Sc. (Econ.) (London), Research Fellow of Fitzwilliam College; Mr K.J. WIGLEY, M.A. (Cantab.).

Junior Research Officers: Mr A.G. ARMSTRONG, M.A. (Cantab.), Fellow (elect) of Selwyn College; Mr T.S. BARKER, M.A. (Cantab.), M.A. (Edin.), Fellow of Downing College; Mrs R. CROMPTON, B.Sc. (Sociology) (London); Mr M.J. GREEN, B.A. (Exeter); Mr L.J. HANDY, B.A. (Leeds); Mr S.J. POTTER, M.A. (Cantab.).

Research Consultants: Mr J.P.P. HIGGINS, B.Sc. (Econ.) (London); Mr D.A.S. JACKSON, B.A., B.Phil. (Oxon.); Mr J.M. MANN, B.A. (Oxon.); Mr J.P. MOYLE, B.Sc. (Manchester), F.R.I.C.S.; Mr C.T. TAYLOR, M.A. (McGill); Mr F.E. TOWNSON.

71. The following, although not formally holding University posts in the Department, are closely associated with the Department's research activities:

Faculty Teaching Officers

Mr P. ABRAMS, Ph.D., M.A. (Cantab.), Fellow of Peterhouse, Lecturer in Sociology.

Miss P.M. DEANE, M.A. (Cantab.), M.A. (Glasgow), Fellow of Newnham College, Lecturer in Economics.

Mr C.H. FEINSTEIN, Ph.D. (Cantab.), B.Comm. (Witwatersrand), Fellow of Clare College, Lecturer in Economics.

Mr K.D. GEORGE, M.A. (Cantab.), M.A. (Wales), Fellow of Sidney Sussex College, Assistant Lecturer in Economics.

Mr J.H. GOLDTHORPE, M.A. (Cantab.), B.A. (London), Fellow of King's College, Lecturer in Sociology.

Mr D. LOCKWOOD, Ph.D. (Econ.), B.Sc. (Econ.) (London), Fellow of St John's College, Lecturer in Sociology.

Mr R.L. MARRIS, Sc.D., M.A. (Cantab.), Fellow of King's College, Lecturer in Economics.

Mr C.STJ. OHERLIHY, M.A. (Cantab.), B.A. (N.U.I.), Fellow of Trinity Hall, Lecturer in Economics.

Mr M.V. POSNER, M.A. (Oxon.), M.A. (Cantab.), Fellow of Pembroke College, Lecturer in Economics.

Professor E.A.G. ROBINSON, C.M.G., M.A. (Cantab.), F.B.A., Fellow of Sidney Sussex College, Emeritus Professor of Economics.

Mr A. SILBERSTON, M.A. (Cantab.), Fellow of St John's College, Lecturer in Economics.

Mr A. SINGH, M.A. (Cantab.), M.A. (Howard), B.A. (Punjab), Fellow of Queens' College, Assistant Lecturer in Economics.

Professor RICHARD 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.

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

Other Research Associates

Mr F. BECHHOFFER, M.A. (Cantab.).

Mr G.E.A. KENTFIELD, B.A. (Oxon.); on secondment from the Bank of England.

Miss B.A. MERCER, M.A. (Toronto), B.A. (McGill).

Mr J.O.N. PERKINS, Ph.D., M.A. (Cantab.).

Miss J.A. PLATT, B.A. (Cantab.), M.A. (Sociology) (Chicago).

Mrs D.E. WEDDERBURN, M.A. (Cantab.).

72. During the period covered by this Report Mr K.D. GEORGE, M.A. (Cantab.), M.A. (Wales), Research Officer, became an Assistant Lecturer in the Faculty of Economics and Politics.

Assistant Staff

73. The following is a list of the assistant staff at September 1967:

Secretary: Mr H. LOSHAK.

Administrative Officer: Mr R.C. LAWRENCE.

Librarian: Miss O.E. HICKSON.

Secretarial and Clerical Staff: Mrs L.E. SILK (Senior Typist); Miss J.S. BURSEY; Miss J. CHAPMAN; Mrs J.R. CONNOR; Miss C.A. HUDSON; Miss E.M. LUDLOW; Miss L.M. NEWMAN; Mrs J.E. REITTER; Miss V.A. SADDINGTON-SHATFORD; Miss A.C. TWYMAN.

Computing and Statistical Staff: Miss M.R. CLARKE (Senior Computer); Mr E.D. BOUGOURD (Senior Statistical Assistant); Mrs V.J. LEA (Senior Computing Operator); Miss D.M. DAY; Mr J.A. EASTABROOK; Miss R. LEVERETT; Mrs J.M. MORRISON; Miss M.C. O'BRIEN; Miss S.D. SEAL; Mrs U.D.W. SURIYAARACHCHI, B.A. (Econ.) (Ceylon); Mr I.P. TATHAM; Miss P.A. WARREN.

74. We regret to record the death of Mr R.M.D. DAVIES, M.P., B.A. (London), who was secretary of the Department from 1949 to 1966.