

## CURRICULUM VITAE

**NAME** Jonathan Vivian Rosenhead

**NATIONALITY** British

### ACADEMIC AND PROFESSIONAL CAREER

1956 State Scholarship to St. John's College, Cambridge.  
 1956-59 St. John's College, Cambridge.  
 1959 B.A. (Cantab) in Mathematics.  
 1959-61 University College, London.  
 1961 M.Sc. in Statistics at University College, London.  
 (Title of Thesis: "A correlation analysis of two-dimensional material": a study of two-dimensional autocorrelation structure, with an extension of Quenouille's test for homogeneity of structure.)  
 1961-3 Operational Research Scientist with the Department of Cybernetics and Operational Research, United Steel Companies, Sheffield, England.  
 1963 M.A. (Cantab).  
 1963-66 Operational Research Scientist (latterly Senior Scientist) with Science in General Management Ltd. (SIGMA), Croydon, England.  
 1966-67 Research Investigator in Management Science Center, Wharton School, University of Pennsylvania.  
 1967-81 Lecturer in Operational Research at the London School of Economics.  
 1981-87 Senior Lecturer in Operational Research at the London School of Economics.  
 1987-2003 Professor of Operational Research at the London School of Economics.  
 2003- Emeritus Professor, London School of Economics.  
 1974-75 Visiting Associate Professor in Social Systems Sciences, Wharton School, University of Pennsylvania.  
 1994 Visiting Erskine Fellow, University of Canterbury, Christchurch, New Zealand.  
 1979 President's Medal of the Operational Research Society.  
 1987 Goodeve Medal of the Operational Research Society.  
 1992 Beale Medal of the Operational Research Society.  
 2006 Companion of Operational Research.  
 1986-87 President of the Operational Research Society.

## **PROFESSIONAL PUBLICATIONS**

1. Statistical Forecasting - an O.R. technique. SIGMA paper No.6. Published by Science in General Management Ltd., Croydon (1964).
2. Forecasting in the Factory. *Factory Management*, Vol 33,12 (December 1964).
3. Simulation of Scheduling and Movement of Traffic Through a Ship Entrance Lock (with M.J. Kent). *Metra*, Vol 5,2 (1966).
4. The Simulation of a Ship Entrance Lock (with M.J. Kent). In *Digital Simulation in Operational Research*, English Universities Press (1967).
5. An Extension of Quenouille's Test for the Compatibility of Correlation Structures in Time Series. *Journal of the Royal Statistical Society, Series B*, Vol 30,1 (1968).
6. Experimental Simulation of a Social System. *Operational Research Quarterly*, Vol 19,3 (September 1968).
7. Robustness in Sequential Investment Decisions (with S. Gupta). *Management Science*, Vol 15,2 (October 1968). Also reprinted in *Decision Making in Urban Planning* (ed. I.M. Robinson), Sage, Los Angeles (1972).
8. Simulation Models of Consumer Behaviour. *British Journal of Marketing*, Vol 4,3 (Autumn 1970).
9. Micro-Simulation of Markets (with M. Elton). *Operational Research Quarterly*, Vol 22,2 (June 1971). Also reprinted in *Reader in Operations Research for Libraries* (eds. P. Brophy, M.K. Buckland and A. Hindle), Information Handling Services, Englewood Col. (1976).
10. The Effect of the Demand Distribution in Inventory Models Combining Holding, Stockout and Reorder Costs (with F.G. Foster and V. Siskind). *Journal of the Royal Statistical Society, Series B*, Vol 32,2 (1971).
11. Robustness and Optimality as Criteria for Strategic Decisions (with M.J. Elton and S.K. Gupta). *Operational Research Quarterly*, Vol 23,4 (December 1972).
12. Replies to comments on 'Robustness and Optimality' by D.J. White and R.G. Dyson (with M.J. Elton and S.K. Gupta). *Operational Research Quarterly*, Vol 24,2 (June 1973).
13. The Optimal Location of Transverse Transport Links. *Transportation Research*, Vol 7,1 (March 1973).
14. Some Comments on 'A Note on the Location of Depots', by Ralph D. Snyder. *Management Science*, Vol 19,7 (March 1973).
15. The Ice Cream Man Problem (with G. Powell). *Transportation Research*, Vol 9 (1975).
16. A Comment on Ackoff's "The Social Responsibility of Operational Research" (joint author). *Operational Research Quarterly*, Vol 26,1,i (March 1975). Reprinted in S Eilon (ed.) *Management Science: an anthology*, Vol III, Dartmouth, 1996.
17. *Scientific Communication and Technology Transfer System* (joint author). Report to the National Science Foundation. University of Pennsylvania, Philadelphia (1975).
18. Some comments on Professionalization and the Fellowship for Operational Research. *OR/MS Today*, Vol 2,4 (July 1975).
19. A Study of the Impacts on the U.S.A. of a Ban on One-Way Beverage Containers (joint author). Busch Center, University of Pennsylvania, Philadelphia (1976).
20. Some Further Comments on the Social Responsibility of Operational Research. *Operational Research Quarterly*, Vol 27,1,ii (1976). Reprinted in S. Eilon (ed.) *Management Science: an anthology*, Vol III, Dartmouth, 1996.
21. Seek Times for Disc File Processing: some results from probability theory (with V. Siskind). *The Computer Journal*, Vol 19,4 (Nov. 1976).

22. Operational Research in Urban and Social Planning. Presented at Second International Research Conference on Operational Research, Stratford upon Avon, April 1976.
23. *Designing a National Scientific and Technological Communication System*, R.L. Ackoff et al., University of Pennsylvania Press 1976 (contributing author).
24. Operational Research in Health Services Planning. *European Journal of Operational Research*, Vol 2,2 (March 1978).
25. An Education in Robustness. *Journal of the Operational Research Society*, Vol 29,2 (February 1978).
26. A Note on Robustness and Interdependent Decision Making (with P. Wiedemann). *Journal of the Operational Research Society*, Vol 30,9 (September 1979).
27. Operational Research and Cost Benefit Analysis: whose science? (with C. Thunhurst). In J. Irvine, I. Miles and J. Evans (eds.) *Demystifying Social Statistics*, Pluto Press, 1979.
28. Planning Under Uncertainty I: the inflexibility of methodologies. *Journal of the Operational Research Society*, Vol 31,3 (March 1980).
29. Planning Under Uncertainty II: a methodology for robustness analysis. *Journal of the Operational Research Society*, Vol 31,4 (April 1980).
30. Operational Research in Urban Planning. *Omega*, Vol 9,4 (1981). Also in *The Production of the Built Environment: Proceedings of the Second Bartlett Summer School*, University College London, 1980. Reprinted in S. Eilon (ed.) *Management Science: an anthology*, Vol III, Dartmouth, 1996.
31. A Materialist Analysis of Operational Research (with C. Thunhurst). *Journal of the Operational Research Society*, Vol 33,2 (February 1982).
32. A Materialist Analysis of Operational Research - a response (with C. Thunhurst). *Journal of the Operational Research Society*, Vol 33,8 (August 1982).
33. Why Does Management Need Management Science? In L. Troncale (ed.) *A General Survey of Systems Methodologies Vol 2*. Society for General Systems Research, Louisville Ky., 1982.
34. The Benefits of Operational Research - A Response to J.C.R. Hewgill (with C. Thunhurst). *Journal of the Operational Research Society* Vol 34,9 (September 1983).
35. Operational Research in Social Planning. In J. Midgley and D. Piachaud (eds.) *The Fields and Methods of Social Planning*, Heinemann, 1984.
36. Debating Systems Methodology: conflicting ideas about conflict and ideas. *Journal of Applied Systems Analysis*, Vol 11 (1984).
37. A System of Systems Conferences. *Journal of the Operational Research Society*, Vol 36,9 (September 1985).
38. Custom and Practice. *Journal of the Operational Research Society*, Vol 37,4 (April 1986).
39. Robustness in Practice: the regional planning of health services (with G. Best and G. Parston). *Journal of the Operational Research Society*, Vol 37,5 (May 1986).
40. From Management Science to Workers Science. In M.C. Jackson and P. Keys (eds.) *New Directions in Management Science*, Gower, 1987.
41. Operational Research at the Crossroads: Cecil Gordon and the development of post-war OR. *Journal of the Operational Research Society*, Vol 40,1 (January 1989).
42. OR: Social Science or Barbarism? In M.C. Jackson, P. Keys and S.A. Cropper (eds.) *Operational Research and the Social Sciences*, Plenum, 1989.
43. *Rational Analysis for a Problematic World* (ed., plus author of 4 chapters). Wiley,

1989. (Japanese edition published 1992).
44. A Service Planning Model for HIV and AIDS (with T. Bowen and P. Forte). In Proceedings of IIASA Conference on Modelling the Spread of HIV/AIDS and its Demographic and Social Consequences, Budapest, November 1989.
  45. Operational Research - from past imperfect to future subjunctive. In R.L. Flood, M.C. Jackson and P. Keys (eds.) *Systems Prospects: the next ten years of systems research*, Plenum, 1990.
  46. Joint editor (with R.V. Vidal and C.T. Bornstein), Special Issue on Operational Research in Developing Countries, *European Journal of Operational Research*, Vol 49, 2 (November 1990).
  47. Operational Research in Less Developed Countries: a critical approach (with C.T. Bornstein). *European Journal of Operational Research*, Vol 49, 2 (November 1990).
  48. The Dog that Didn't Bark: the unrealised social agenda of operational research. In H.E. Bradley (ed.) *Operational Research '90*, North Holland, 1991.
  49. Planning for HIV and AIDS in a Health District. In B. Dangerfield and C. Roberts (eds.) *OR Work in HIV/AIDS*, Operational Research Society, 1991.
  50. AIDSPLAN: A decision support model for planning the provision of HIV/AIDS-related services (with E. Rizakou and K. Reddington). *Interfaces*, Vol 21,3 (May-June 1991).
  51. Swords into Ploughshares: Cecil Gordon's role in the post-war transition of operational research to civilian uses. *Public Administration*, Vol 69,4 (Winter 1991).
  52. Into the Swamp: the analysis of social issues. *Journal of the Operational Research Society*, Vol 43,4 (April 1992).
  53. Introduction to Japanese edition of Rational Analysis for a Problematic World, Tokyo, 1992.
  54. Community Operational Research and Cooperative Management. Proceedings, Workshop on Logistics and Quality Control, Symposium on Management of Rural Cooperatives, Anand, India, Dec 1992.
  55. A Rejoinder from the Swamp. *Journal of the Operational Research Society*, Vol 44,1 (January 1993).
  56. Enabling Analysis: across the developmental divide. *Systems Practice*, Vol 6,2 (April 1993).
  57. Joint editor (with C. Eden, M.S. Jackson and R. Tomlinson), special issue on The Interface between OR and the Social Sciences, *Journal of the Operational Research Society* Vol 44,6 (June 1993).
  58. Problem Structuring for Medical Quality Assurance (with A. Gains). Working paper 93.8, Operational Research, LSE, November 1993.
  59. One-Sided Practice: can we do better? In W.A. Wallace (ed.) *Ethics in Modelling*, Pergamon, Oxford, 1994.
  60. A decision support system for planning the provision of HIV/AIDS - related services (with P. Forte and E. Rizakou). In E.H. Kaplan and M.L. Brandeau (eds.) *Modelling the AIDS Epidemic: planning, policy and prediction*, Raven Press, New York, 1994.
  61. Problem Structuring Methods. Tutorial paper presented at ORSA/TIMS Meeting (Boston April 1994), CLAIO 7 (Santiago, Chile, July 1994), EURO XIII (Glasgow, July 1994).
  62. Only Connect Part I (with D.C. Lane). In Proceedings of the International System Dynamics Conference, Stirling, July 1994.
  63. Conflict resolution at Nucleus (with L. White). In C. Ritchie, A. Taket and J. Bryant (eds.) *Community Works*, PAVIC Publications, 1994.
  64. Liberty! Fraternity! Analytic Capability! In E. Barker (ed.) *LSE on Freedom*, LSE,

- 1995; also Transaction Publishers, 1997.
65. Nuclear fusion: some linked case studies in Community Operational Research (with L.White). *Journal of the Operational Research Society*, Vol 47, 4 (April 1996).
  66. Problem Structuring Methods. In S.I.Gass and C.M. Harris (eds.) *Encyclopaedia of Operational Research and Management Science*, Kluwer, 1996.
  67. *Operational Research For Development* (ed., with A.Tripathy), New Age International, 1996.
  68. Reflections on the use of New Technologies in Less Developed Countries: the use of data processing in dairy cooperatives in Brazil (with C.J.Bornstein and P.R.C.Villela). In Rosenhead and Tripathy (eds.) *Operational Research for Development*, New Age International, 1996.
  69. Between two stools: a possible future for operational research. *Ricerca Operativa* Vol 27, 77 (Spring 1996).
  70. What's the problem? An introduction to problem structuring methods. *Interfaces* Vol 26, 6 (Nov-Dec 1996).
  71. A Rigorous Definition of Robustness Analysis (with H-Y Wong) LSE OR Working Paper 97.22, LSE, 1997.
  72. Introduction. In J. Mingers and A. Gill (eds.) *Multimethodology: the theory and practice of combining management science methodologies*, Wiley, 1997.
  73. Emergency – but no accident (with D. Lane). *Eurohealth* Vol 4, 1, Winter 1997/8.
  74. Success and Survival – a comment. *Journal of the Operational Research Society* Vol 49, 4, 1998.
  75. Complexity Theory and Management Practice. LSE OR Working Paper 98.25, LSE, 1998.
  76. A rigorous definition of robustness analysis (with H. Y. Wong). *Journal of the Operational Research Society*, Vol 51, 2 (Feb 2000).
  76. Looking in the wrong place for healthcare improvements: a system dynamics study of an accident and emergency department (with D.C. Lane and C. Monefeldt). *Journal of the Operational Research Society*, Vol 51, 5, (May 2000).
  77. Decision support for organisational risk management by problem structuring (with T. Horlick-Jones, I. Georgiou, J. Ravetz and R. Lofstedt). *Health, Risk and Society* Vol 3, 2 (2001).
  78. *Rational Analysis for a Problematic World Revisited* (ed., with J. Mingers), Wiley, 2001. Spanish language edition published 2004, IVEPLAN, Venezuela.)
  79. Operational research. In N. Fulop, P. Allen, A. Clarke and N. Black (eds.) *Studying the Organisation and Delivery of Health Services: research methods*, Routledge, London, 2001.
  80. The role of Wide-band GDSS in increasing value for multi-organisational groups: the case of the UK construction industry (with L.A. Franco). In F. Ackermann and G-J de Vreede (eds.) *Proceedings of the 2001 Group Decision and Negotiation Conference*, La Rochelle, France.
  81. Robustness analysis. In H.G. Daellenbach and R.L. Flood (eds.) *The Informed Student Guide to Management Science*, Thomson, London, 2002.
  82. Problem structuring methods for cross-organizational learning (with L.A. Franco and M. Cushman). In D. Purdue and M. Stewart (eds.) *Understanding Collaboration: international perspectives on theory and practice*, University of West of England, Bristol, 2002.
  83. Investigating risk, organisations and decision support through action research (with Tom Horlick-Jones). *Risk Management: an international journal* Vol 4, 4 (2002).
  84. Robustness analysis, *Newsletter of European Working Group on Multi Criteria*

- Decision Analysis*, Fall 2002.
85. Leonid Kantorovich (OR Hall of Fame) *International Transactions in Operational Research* Vol 10 (6) pp665-667
  86. Project review and learning in the construction industry: embedding a problem structuring method within a partnership context (with Alberto Franco and Mike Cushman). *European Journal of Operational Research*, Vol 152 (2004).
  87. Problem Structuring Methods in action (with John Mingers). *European Journal of Operational Research*, Vol 152 (2004), 530-554.
  88. The past, present and future of Problem Structuring Methods. In KAH Kobbacy (ed) Keynote Papers OR Forty Six, Operational Research Society, Birmingham 2004. (Proc Annual Conference, York.).
  89. Controversy on the Streets: stakeholder workshops on a choice of carnival route. In J Friend and A Hickling *Planning Under Pressure: the strategic choice approach*, Elsevier Butterworth-Heinemann, Oxford, 2004 (3<sup>rd</sup> edition).
  90. Planning in the face of politics: reshaping children's health services in inner London (with M Cushman). In ML Brandeau, F Sainfort and WP Pierskalla *Operations Research and Health Care: a handbook of methods and applications*, Kluwer, 2004.
  91. Problem Structuring Methods as an aid to multiple-stakeholder evaluation. In D Miller and D Patassini (eds) *Beyond Benefit Cost Analysis: accounting for non-market values in planning evaluation*, Ashgate, Aldershot, 2005.
  92. The past, present and future of Problem Structuring Methods. *Journal of the Operational Research Society*, Vol 57, 7, (July 2006), 759-765.
  93. Stafford Beer (OR Hall of Fame) *International Transactions in Operational Research* Vol 13 (6) pp577-581.
  94. The uses of observation – combining problem structuring methods and ethnography (with T Horlick-Jones). *Journal of the Operational Research Society*, Vol 58, 5, (May 2007), 588-601.
  95. Developing Robust Strategies. Unit 16, Block 4 "Creating the Future", BS811 Strategic Management in Life Sciences and Healthcare, Open University, Milton Keynes, 2007 (ISBN 978 0 7492 23878).
  96. Robustness Analysis for sustainable community development (with C T Bornstein and A A Namen). *Journal of the Operational Research Society*, Vol 60, 5, (May 2009) 587-597.
  97. Reflections on fifty years of operational research. *Journal of the Operational Research Society* Vol 60 (Supplement 1) (May 2009) S5-S15.
  98. The use of Robustness Analysis for planning actions in a poor Brazilian community (with A A Namen and C T Bornstein, *Pesquisa Operacional*, Vol 30, 2 (May to August 2010), 267-280
  99. Profile of Stafford Beer. In *Profiles in Operations Research* (eds S Gass and A Assad) Springer, forthcoming.
  100. Profile of Russell Ackoff (with M. Kirby). In *Profiles in Operations Research* (eds S Gass and A Assad) Springer, forthcoming
  101. Profile of Patrick Blackett (with M. Kirby). In *Profiles in Operations Research* (eds S Gass and A Assad) Springer, forthcoming
  102. Profile of Leonid Kantorovich (with S. Gass). In *Profiles in Operations Research* (eds S Gass and A Assad) Springer, forthcoming

## **BOOK REVIEWS AND OTHER WRITINGS**

1. Local Government and Strategic Choice (by JK. Friend and WN Jessop) in *New Society* (8 May 1969).
2. Networks - for Control or Self-Management. *The Listener*, 31 August 1972.
3. Social Dimensions of Science and Technology. Published under the title 'Social Aspects' in 'The Predicament of Man' (ed. M. Goldsmith), Science Policy Foundation, London 1972.
4. Government and the Planning Process (by P.H. Levin) - in *Journal of the Operational Research Society* Vol 29,5 (May 1978).
5. Architect or Bee: the human/technology relationship (by M. Cooley); and Living Think Work: where do labour processes come from? (by M. Hales) -in *Journal of the Operational Research Society* Vol 32,7 (July 1981).
6. Series of articles "From the President", *OR Newsletter* Vols 15-6 (1986-7). Article from Vol 15,5 reprinted in translation in *Information Bulletin of Hellenic Operational Research Society*, June 1986.
7. Preface to S. French, *Readings in Decision Analysis*, Chapman and Hall, 1989.
8. Speech on posthumous presentation of Operational Research Society Silver Medal to Leonid Kantarovich. In L.J. Leifman (ed.) *Functional Analysis, Optimization and Mathematical Economics*, Oxford University Press, 1990.
9. Soft Systems Methodology in Action (by P.B.Checkland and J.Scholes) - in *European Journal of Information Systems* Vol 1,3 (August 1991).
10. Politics of the Gut Reaction, *Guardian*, 5 May 1992.
11. Obstacles to Scientific Management in Developing Countries, *India Express*, 14 December 1992.
12. ICORD '92 - International Conference on OR for Development. *The OR for Developing Countries Newsletter* 3,3 (March 1993).
13. Lord Zuckerman (obituary). *OR Newsletter* (July 1993).
14. How Sir Humphrey Stymied OR. *OR Newsletter* (March 1994).
15. A Case for Policy Analysis. *New Zealand Operational Research Society Newsletter* (October 1994).
16. Living Without Fear - the case against Chartered Status, *OR Newsletter* (January 1995).
17. Emergency – but no accident (with D. Lane) *LSE Magazine*, Winter 1997.
18. Blackett's Circus: Patrick Blackett and the birth of operational research, Blackett Centenary Conference, Imperial College, April 1998.
19. Ahmedabad 6 years on – has IFORS delivered? *OR for Developing Countries Newsletter*, Vol 6, 2 pp 5-8 (November 1998).
20. Is OR Local? *OR/MS Today*, April 1999.
21. A Spectrum of Risks (with T Horlick-Jones and N. Chown), *Risk Management Bulletin* 3 (10) June 1999
22. Stafford Beer (obituary). *Journal of the Operational Research Society*, 54 (12), Dec 2003.
23. Russell L. Ackoff (with M Kirby), IFORS' Operational Research Hall of Fame, *International Transactions in Operational Research*, 12 (1), January 2005.
24. Operational Research and the Middle East, *Inside OR*, no 473, May 2010.

## **PROFESSIONAL EXPERIENCE**

Professional experience includes:

1. The study of several related problems on the minimisation of scrap in the cut-up of steel bars of variable length.
2. A study, for a light engineering company, of the placing and level of quality-control inspection.
3. Work for a wholesale/retail organisation, on stock-control policy with quantity discounts and multiple lines.
4. Construction of a simulation model of attitude change, for the prescription of drugs by doctors.
5. The simulation of scheduling and operations of a ship entrance lock, to examine its adequacy under conditions of increased traffic.
6. A newspaper decentralisation project involving the siting, capacities and layout of the plants.
7. A sequential plant location problem involving the identification of robust (rather than 'optimal') initial decisions.
8. Construction of a model of the market for a package grocery, based on the simulation of consumer behaviour.
9. A study of the timing characteristics of disc and tape computer systems.
10. A study of the inter-relation of the introduction of new information transmission technology and of office re-location decisions.
11. A feasibility study for an industry-supported rural development project in Mexico.
12. A study of the effects on the US environment and economy of a ban on one-way beverage containers.
13. Development of a flexible, multi-future planning system for a Canadian health-care agency.
14. An analysis of the case for construction of a hospital, and of possible locations for it.
15. Clarification and interpretation of a model for predicting patient flows, to facilitate region-district negotiations over hospital closures.
16. Development of a micro-computer based planning tool for allocation of resources related to the treatment of AIDS.
17. Facilitation of medical audit in a hospital specialism, employing cognitive mapping and Soft Systems Methodology.
18. Planning for civilian emergency evacuation.
19. Comparative evaluation of a government department's operational programmes, using decision conferencing.
20. Development of a system dynamics model of the interconnections between patient waiting times at Accident and Emergency, bed numbers, and management strategies for hospital resources.
21. Development of safety policies for a national utility.
22. Planning the future shape of the Notting Hill Carnival.
23. Designing a cross-organisation learning approach for use in the construction industry.
24. Contribution to assessment procedures for the South African Science and Technology Foresight programme.
25. Advice on disaster relief and regional planning in Venezuela.
26. Helping multiple stakeholders to redesign paediatric care arrangements for an Inner London health district.



27. Contribution to the design of development planning processes in Venezuela.
28. Workshop on policies to counter health inequalities in London
29. Advisor on problems with the electricity supply industry in Venezuela

## **SPECIAL MATTERS**

I am a member of the Operational Research Society. In 1973-4 I was a member of its National Events Committee; and I was a member of the programme committee for the Operational Research Society Annual Conference for 1977, and for the EURO Summer Institute held at the University of Canterbury in 1986. I have reviewed books for the Journal of the Operational Research Society, Journal of the Royal Statistical Society, Applied Statistics, Economica, Town and Country Planning, Cambridge Review, New Society and New Scientist.

From 1982-7 I contributed on a regular basis to the programme of the Kings Fund College, teaching analytic methods and planning for senior health service managers. In 1981 I gave a series of seminars on 'Operational Research in Urban Planning' at the Central University of Venezuela; in 1984 I collaborated in a course on 'Information Technology and the Planning of Information Systems' at the National Autonomous University of Mexico; and in 1987 gave a seminar series on 'Applications of Informatics' at the Federal University of Rio de Janeiro. In June 1991 I was the tutor to a Summer School on Problem Structuring Methods held in Reykjavik, and sponsored by the Nordic Council.

I act as a consultant on planning problems, with a concentration on the planning of health services, and was an advisor to the All Party Parliamentary Group on AIDS from 1990-3. During 1990-1 I was a member of the Home Office Working Group on The Partnership in Crime Prevention, and a signatory of its report "Safer Communities". I was Advisor to the Ministry of Planning and Development of the Government of Venezuela in 2000-7, and to the Ministry of Finance and Planning in 2010.

I have read papers at international conferences since 1965, including plenary or semi-plenary addresses at a number of international conferences including IFORS XII (Athens 1990), CLAIO 7 (Santiago 1994) and EURO XIII (Glasgow 1994). I have given plenary addresses to the national operational research society conferences of SORA (Stockholm 1989), ORSSA (Johannesburg 1995), APDIO, (Lisbon 1996) AIRO (Perugia 1996) and INFORMS (Atlanta 1996). I was an Editorial Associate for the European Journal of Operational Research from 1981 to 1984. I am currently a member of the Editorial Board of Omega, and of Health Care Management Science. In 1990 and 1993 I was a member of the jury for the IFORS Third World Prize, and in 1996 was Chair of the jury of the renamed Operational Research in Development Prize. In 1992 I was joint chair of ICORD '92 (International Conference on OR for Development) in Ahmedabad; and in 2005 I co-chaired ICORD V at Jamshedpur. In 2006 I was a jury member for EURO's Management Science Strategic Innovation Prize. I am on the Editorial Board of the International Journal of Strategic Decision Sciences.

In 1966 I was a Labour Parliamentary candidate. During 1971-2 I was Chair of the British Society for Social Responsibility in Science, and have been Secretary of the British Committee for the Universities of Palestine since 2008. I have published extensively on

issues of Science and Society. I am a Trustee of the Science and Society Trust, and of the Human Nature Trust.

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