
Choice, Rules and Collective Action

The Ostroms on the Study
of Institutions and Governance

Elinor Ostrom and Vincent Ostrom

Introduced and Edited by
Filippo Sabetti and Paul Dragos Aligica



© Elinor Ostrom and Vincent Ostrom 2014

Cover image – *Fotolia.com* © dedoma

Photographs courtesy of the Ostrom Workshop and Indiana University

Published by the ECPR Press in 2014

The ECPR Press is the publishing imprint of the European Consortium for Political Research (ECPR), a scholarly association, which supports and encourages the training, research and cross-national co-operation of political scientists in institutions throughout Europe and beyond.

ECPR Press
University of Essex
Wivenhoe Park
Colchester
CO4 3SQ
UK

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Typeset by ECPR Press

Printed and bound by Lightning Source

British Library Cataloguing in Publication Data

A catalogue record for this book is available from the British Library

Paperback ISBN: 978-1-910-259-13-9
PDF ISBN: 978-1-910-259-15-3
Kindle ISBN: 978-1-910-259-16-0
ePub ISBN: 978-1-910-259-17-7

www.ecpr.eu/ecprpress

ECPR Press Series Editors:

Dario Castiglione (University of Exeter)
Peter Kennealy (European University Institute)
Alexandra Segerberg (Stockholm University)
Peter Triantafillou (Roskilde University)

ECPR Essays:

Croce, Gramsci, Bobbio and the Italian Political Tradition (ISBN: 9781907301995)
Richard Bellamy

From Deliberation to Demonstration: Political Rallies in France, 1868–1939 (ISBN: 9781907301469) Paula Cossart

Hans Kelsen and the Case for Democracy (ISBN: 9781907301247) Sandrine Baume
Is Democracy a Lost Cause? Paradoxes of an Imperfect Invention
(ISBN: 9781907301247) Alfio Mastropaoletti

Just Democracy (ISBN: 9781907301148) Philippe Van Parijs

Learning About Politics in Time and Space (ISBN: 9781907301476) Richard Rose
Maestri of Political Science (ISBN: 9781907301193) Donatella Campus,
Gianfranco Pasquino, and Martin Bull

Masters of Political Science (ISBN: 9780955820335) Donatella Campus, and
Gianfranco Pasquino

The Modern State Subverted (ISBN: 9781907301636) Giuseppe Di Palma

ECPR Classics:

Beyond the Nation State (ISBN: 9780955248870) Ernst Haas

Citizens, Elections, Parties: Approaches to the Comparative Study of the Processes of Development (ISBN: 9780955248887) Stein Rokkan

Comparative Politics The Problem of Equivalence (ISBN: 9781907301414) Jan Van Deth
Democracy Political Finance and state Funding for Parties (ISBN: 9780955248801)
Jack Lively

Electoral Change: Responses to Evolving Social and Attitudinal Structures in Western Countries (ISBN: 9780955820311) Mark Franklin, Thomas Mackie, and Henry Valen
Elite and Specialized Interviewing (ISBN: 9780954796679) Lewis Anthony Dexter

Identity, Competition and Electoral Availability: The Stabilisation of European Electorates 1885–1985 (ISBN: 9780955248832) Peter Mair and Stefano Bartolini
Individualism (ISBN: 9780954796662) Steven Lukes

Modern Social Policies in Britain and Sweden: From Relief to Income Maintenance
(ISBN: 9781907301001) Hugh Heclow

Parties and Party Systems: A Framework for Analysis (ISBN: 9780954796617)
Giovanni Sartori

Party Identification and Beyond: Representations of Voting and Party Competition
(ISBN: 9780955820342) Ian Budge, Ivor Crewe, and Dennis Farlie

People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era (ISBN: 9780955248818) Barry Buzan

Political Elites (ISBN: 9780954796600) Geraint Parry

Seats, Votes and the Spatial Organisation of Elections (ISBN: 9781907301353)
Graham Gudgin
State Formation, Parties and Democracy (ISBN: 9781907301179) Hans Daalder
System and Process in International Politics (ISBN: 9780954796624) Mortan Kaplan
Territory and Power in the UK (ISBN: 9780955248863) James Bulpitt
The State Tradition in Western Europe: A Study of an Idea and Institution (ISBN: 9780955820359) Kenneth Dyson

Please visit www.ecpr.eu/ecprpress for up-to-date information about new publications.

Contents

List of Figures and Tables	vii
Acknowledgements	ix
Foreword by Dario Castiglione	xi
Elinor and Vincent Ostrom and the Workshop	xix
Introduction: The Ostroms' Research Program for the Study of Institutions and Governance: Theoretical and Epistemic Foundations <i>Paul Dragos Aligica and Filippo Sabetti</i>	1
Part One: Public Choice and Political Economy	
Chapter One: Public Choice: A Different Approach to the Study of Public Administration <i>Vincent Ostrom and Elinor Ostrom</i>	23
Chapter Two: Polycentricity: The Structural Basis of Self-Governing Systems <i>Vincent Ostrom</i>	45
Chapter Three: The Quest for Meaning in Public Choice <i>Elinor Ostrom and Vincent Ostrom</i>	61
Part Two: Beyond Public Choice: Institutions, Rules and Governance Systems	
Chapter Four: An Agenda for the Study of Institutions <i>Elinor Ostrom</i>	97
Chapter Five: A Behavioural Approach to the Rational Choice Theory of Collective Action <i>Elinor Ostrom</i>	121
Chapter Six: Beyond Markets and States: Polycentric Governance of Complex Economic Systems <i>Elinor Ostrom</i>	167

Part Three: Epistemic and Social Philosophical Perspectives

Chapter Seven: Beyond Positivism <i>Elinor Ostrom</i>	213
Chapter Eight: A Conceptual-Computational Logic for Federal Systems of Governance <i>Vincent Ostrom</i>	227
Chapter Nine: Epistemic Choice and Public Choice <i>Vincent Ostrom</i>	243
Index	271

List of Figures and Tables*Figures*

Figure 3.1: A Framework for Institutional Analysis	68
Figure 3.2: Levels of Analysis and Outcomes	82
Figure 4.1: Predicted Equilibrium Budget/Output Combinations Under Different Rule Configurations	105
Figure 5.1: N-person Social Dilemma	125
Figure 5.2: The Core Relationship	144
Figure 5.3: A Simple Scenario	148
Figure 6.1: Four Types of Goods	172
Figure 6.2: A Framework for Institutional Analysis	174
Figure 6.3: The Internal Structure of an Action Situation	176
Figure 6.4: Rules as Exogenous Variables Directly Affecting the Elements of an Action Situation.	180
Figure 6.5: Microsituational and Broader Contexts of Social Dilemmas Affect Levels of Trust and Cooperation	191
Figure 6.6: Action Situations Embedded in Broader Social-Ecological Systems:	195
Figure 9.1: A Framework of Elements and Stages in Institutional Analysis and Development.	255

Tables

Table 9.1: Hobbes's Laws of Nature [The Way to Peace]	248
Table 9.2: Types of Goods	260

Chapter One

Public Choice: A Different Approach to the Study of Public Administration¹

Vincent Ostrom and Elinor Ostrom

In November 1963, a number of economists and a sprinkling of other social scientists were invited by James Buchanan and Gordon Tullock to explore a community of interest in the study of nonmarket decision making. That conference was reported in *Public Administration Review* as 'Developments in the "No-Name" Fields of Public Administration' (vol. 24, March 1964, pp. 62–63). A shared interest prevailed regarding the application of economic reasoning to 'collective', 'political' or 'social' decision making, but no consensus developed on the choice of a name to characterize those interests. In December 1967 the decision was taken to form a Public Choice Society and to publish a journal, *Public Choice*. The term 'public choice' will be used here to refer to the work of this community of scholars. The bibliography following this article refers to only a small fraction of the relevant literature, but will serve to introduce the reader to public choice literature.

The public choice approach needs to be related to basic theoretical traditions in public administration. As background, we shall first examine the theoretical tradition as formulated by Wilson and those who followed. We shall next examine Herbert Simon's challenge to that tradition which has left the discipline in what Dwight Waldo has characterized as a 'crisis of identity' (Waldo 1968). The relevance of the public choice approach for dealing with the issues raised by Simon's challenge will then be considered.

The traditional theory of public administration

Woodrow Wilson's essay, 'The Study of Administration', called for a new science of administration based upon a radical distinction between politics and administration (Wilson 1887: 210). According to Wilson, governments may differ in the political principles reflected in their constitutions, but the principles of good administration are much the same in any system of government. There is [...] but one rule of good administration for all governments alike', was Wilson's major thesis (Wilson 1887: 218). 'So far as administrative functions are concerned, all

1. Published initially in *Public Administration Review*, vol. 31 (no. 2, Mar–April 1971), pp. 203–216.

governments have a strong structural likeness; more than that, if they are to be uniformly useful and efficient, they must have a strong structural likeness' (Wilson 1887: 218).

Good administration, according to Wilson, will be hierarchically ordered in a system of graded ranks subject to political direction by heads of departments at the centre of government. The ranks of administration would be filled by a corps of technically trained civil servants '[...] prepared by a special schooling and drilled, after appointment, into a perfected organization, with an appropriate hierarchy and characteristic discipline [...]'] (Wilson 1887: 216). Perfection in administrative organization is attained in a hierarchically ordered and professionally trained public service. Efficiency is attained by perfection in the hierarchical ordering of a professionally trained public service. Wilson also conceptualizes efficiency in economic terms: '[...] the utmost possible efficiency and at the least possible cost of either money or of energy' (Wilson 1887: 197).

For the next half-century, the discipline of public administration developed within the framework set by Wilson. The ends of public administration were seen as the 'management of men and material in the accomplishment of the purposes of the state' (White 1926). Hierarchical structure was regarded as the ideal pattern of organization. According to L. D. White, 'All large-scale organisations follow the same pattern, which in essence consists in the universal application of the superior-subordinate relationship through a number of levels of responsibility reaching from the top to the bottom of the structure' (White 1926: 33).

Simon's challenge

Herbert Simon, drawing in part upon previous work by Luther Gulick, (Gulick and Urwick 1937) sustained a devastating critique of the theory implicit in the traditional study of public administration. In his *Administrative Behavior*, Simon elucidated some of the accepted administrative principles and demonstrated the lack of logical coherence among them. (Simon 1964) Simon characterized those principles as 'proverbs'. Like proverbs, incompatible principles allowed the administrative analyst to justify his position in relation to one or another principle. 'No single one of these items is of sufficient importance', Simon concluded, 'to suffice as a guiding principle for the administrative analyst' (Simon 1964: 36).

After his indictment of traditional administrative theory, Simon began an effort to reconstruct administrative theory. The first stage was 'the construction of an adequate vocabulary and analytic scheme'. Simon's reconstruction began with a distinction between facts and values. Individuals engage in a consideration of facts and of values in choosing among alternative possibilities bounded by the ordered rationality of an organization. Simon envisioned the subsequent stage of reconstruction to involve the establishment of a bridge between theory and empirical study 'so that theory could provide a guide to the design of "critical" experiments and studies, while experimental study could provide a sharp test and corrective of theory' (Simon 1964: 44).

One of Simon's central concerns was to establish the criterion of efficiency as a norm for evaluating alternative administrative actions. Simon argued that the 'criterion of efficiency dictates that choice of alternatives which produce the largest result for the given application of resources' (Simon 1964: 179). In order to utilize the criterion of efficiency, the results of administrative actions must be defined and measured. Clear conceptual definitions of output are necessary before measures can be developed.

No necessary reason existed, Simon argued, for assuming that perfection in hierarchical ordering would always be the most efficient organisational arrangement (Simon 1962: 1969). Alternative organisational forms needed to be empirically evaluated to determine their relative efficiency. Simon's own work with Ridley on the measurement of municipal activities represented a beginning effort to identify the output of government agencies and to develop indices to measure those outputs. (Ridley and Simon 1938)

The work of the political economists

During the period following Simon's challenge, another community of scholars has grappled with many of these same intellectual issues. This community of scholars has been composed predominantly of political economists who have been concerned with public investment and public expenditure decisions. One facet of this work has been manifest in benefit-cost analysis and the development of the PPB system (U.S. Congress, Joint Economic Committee, Subcommittee on Economy in Government, 1969). PPB analysis rests upon much the same theoretical grounds as the traditional theory of public administration. The PPB analyst is essentially taking the methodological perspective of an 'omniscient observer' or a 'benevolent despot'. Assuming that he knows the 'will of the state', the PPB analyst selects a program for the efficient utilization of resources (i.e., men and material) in the accomplishment of those purposes. As Senator McClelland has correctly perceived, the assumption of omniscience may not hold; and, as a consequence, PPB analysis may involve radical errors and generate gross inefficiencies (Wildovsky 1966).

Public choice represents another facet of work in political economy with more radical implications for the theory of public administration. Most political economists in the public choice tradition begin with the individual as the basic unit of analysis. Traditional 'economic man' is replaced by 'man: the decision maker'.

The second concern in the public choice tradition is with the conceptualization of public goods as the type of event associated with the output of public agencies. These efforts are closely related to Simon's concern for the definition and measurement of the results of administrative action. In addition, public choice theory is concerned with the effect that different decision rules or decision-making arrangements will have upon the production of those events conceptualized as public goods and services. Thus, a model of man, the type of event characterized as public goods and services, and decision structures comprise the analytical variables in public choice theory. Our 'man: the decision maker' will confront certain opportunities and possibilities in the world of events and will pursue his

relative advantage within the strategic opportunities afforded by different types of decision rules or decision-making arrangements. The consequences are evaluated by whether or not the outcome is consistent with the efficiency criterion.

Work in public choice begins with methodological individualism where the perspective of a representative individual is used for analytical purposes (Brodebeck 1958). Since the individual is the basic unit of analysis, the assumptions made about individual behavior become critical in building a coherent theory (Coleman 1966a, 1966b). Four basic assumptions about individual behavior are normally made.

First, individuals are assumed to be self-interested. The word 'self-interest' is not equivalent to 'selfish'. The assumption of self-interest implies primarily that individuals each have their own preferences which affect the decisions they make, and that those preferences may differ from individual to individual (Buchanan and Tullock 1965).

Secondly, individuals are assumed to be rational. Rationality is defined as the ability to rank all known alternatives available to the individual in a transitive manner. Ranking implies that a rational individual either values alternative 'A' more than alternative 'B', or that he prefers alternative 'B' to alternative 'A', or that he is indifferent as between them. Transitivity means that if he prefers alternative 'A' to alternative 'B', and 'B' is preferred to 'C', then 'A' is necessarily preferred to 'C'. (Boulding 1966; Eulau 1964).

Third, individuals are assumed to adopt maximizing strategies. Maximization as a strategy implies the consistent choice of those alternatives which an individual thinks will provide the highest net benefit as weighed by his own preferences (Wade and Curry 1970). At times the assumption of maximization is related to that of satisfying, depending upon assumptions about the information available to an individual in a decision-making situation (Simon 1957).

Fourth, an explicit assumption needs to be stated concerning the level of information possessed by a representative individual. Three levels have been analytically defined as involving certainty, risk, and uncertainty (Knight 1965; Luce and Raiffa 1957). The condition of certainty is defined to exist when: (1) an individual knows all available strategies, (2) each strategy is known to lead invariably to only one specific outcome, and (3) the individual knows his own preferences for each outcome. Given this level of information, the decision of a maximizing individual is completely determined. He simply chooses that strategy which leads to the outcome for which he has the highest preference (Fishburn 1964).

Under conditions of risk, the individual is still assumed to know all available strategies. Any particular strategy may lead to a number of potential outcomes, and the individual is assumed to know the probability of each outcome (Arrow 1951). Thus, decision making becomes a weighting process whereby his preferences for different outcomes are combined with the probability of their occurrence prior to a selection of a strategy. Under risk, an individual may adopt mixed strategies in an effort to obtain the highest level of outcomes over a series of decisions in the long run.

Decision making under uncertainty is assumed to occur either where (1) an individual has a knowledge of all strategies and outcomes, but lacks knowledge about the probabilities with which a strategy may lead to an outcome, or (2) an individual may not know all strategies or all outcomes which actually exist (Hart 1965; Radner 1970). Uncertainty is more characteristic of problematical situations than either certainty or risk. Under either certainty or risk, an analyst can project a relatively determinant solution to a particular problem. Under conditions of uncertainty, the determinateness of solutions is replaced by conclusions about the range of possible 'solutions' (Shackle 1961).

Once uncertainty is postulated, a further assumption may be made that an individual learns about states of affairs as he develops and tests strategies. (Simon 1959; Thompson 1966) Estimations are made about the consequences of strategies. If the predicted results follow, then a more reliable image of the world is established. If predicted results fail to occur, the individual is forced to change his image of the world and modify his strategies (Ostrom 1968). Individuals who learn may adopt a series of diverse strategies as they attempt to reduce the level of uncertainty in which they are operating (Cyert and March 1963; Stigler 1961).

The nature of public goods and services

Individuals who are self-interested, rational, and who pursue maximizing strategies find themselves in a variety of situations. Such situations involve the production and consumption of a variety of goods. Political economists in the public choice tradition distinguish situations involving purely private goods as a logical category from purely public goods (Davis and Winston 1967; Samuelson 1955; 1954). Purely private goods are defined as those goods and services which are highly divisible and can be (1) packaged, contained, or measured in discrete units, and (2) provided under competitive market conditions where potential consumers can be excluded from enjoying the benefit unless they are willing to pay the price. Purely public goods, by contrast, are highly indivisible goods and services where potential consumers cannot be easily excluded from enjoying the benefits (Breton 1966). Once public goods are provided for some, they will be available for others to enjoy without reference to who pays the costs. National defence is a classic example of a public good. Once it is provided for some individuals living within a particular country, it is automatically provided for all individuals who are citizens of that country, whether they pay for it or not.

In addition to the two logical categories of purely private and purely public goods, most political economists would postulate the existence of an intermediate continuum. Within this continuum, the production or consumption of goods or services may involve spill-over effects or externalities which are not isolated and contained within market transactions (Ayres and Kneese 1969; Buchanan and Stubblebine 1962; Davis and Winston 1962; Mishan 1967). Goods with appreciable spill overs are similar to private goods to the extent that some effects can be subject to the exclusion principle; but other effects are like public goods and spill over onto others not directly involved (Coase 1960). The air pollution

which results from the production of private industry is an example of a negative externality. Efforts to reduce the cost of a negative externality is the equivalent of providing a public good. The benefits produced for a neighbourhood by the location of a golf course or park is a positive externality.

The existence of public goods or significant externalities creates a number of critical problems for individuals affected by those circumstances (Buchanan, 1968; Head 1962; Phelps 1965). Each individual will maximize his net welfare if he takes advantage of a public good at minimum cost to himself (Demsetz 1967). He will have little or no incentive to take individual action where the effect of individual action would be to conserve or maintain the quality of the good that each shares in common. Each individual is likely to adopt a 'dog-in-the-manger' strategy by pursuing his own advantage and disregarding the consequences of his action upon others. Furthermore, individuals may not even be motivated to articulate their own honest preferences for a common good. (Demsetz 1970; Musgrave 1959; Thompson 1968) If someone proposes an improvement in the quality of a public good, some individuals may have an incentive to withhold information about their preferences for such an improvement (Schelling 1963). If others were to make the improvement, the individual who had concealed his preference could then indicate that he was not a beneficiary and might avoid paying his share of the costs. If voluntary action is proposed, some individuals will have an incentive to 'hold-out', act as 'free-riders', and take advantage of the benefits provided by others (Cunningham 1967; Hirshleifer, DeHaven and Millman 1960). Garret Hardin had indicated that these strategies typically give rise to 'the tragedy of the commons' where increased individual effort leaves everyone worse off (Hardin 1968).

The effect of decision structures upon collective action

The Problem of Collective Inaction. The problem arising from the indivisibility of a public good and the structure of individual incentives created by the failure of an exclusion principle is the basis for Mancur Olson's *The Logic of Collective Action* (Olson 1965). Olson concludes that individuals cannot be expected to form large voluntary associations to pursue matters of public interest unless special conditions exist (Musgrave 1939). Individuals will form voluntary associations in pursuit of public interests only when members will derive separable benefits of a sufficient magnitude to justify the cost of membership or where they can be coerced into bearing their share of the costs (Burgess and Robinson 1969; Garvey 1969; Leoni 1957). Thus, we cannot expect persons to organise themselves in a strictly voluntary association to realize their common interest in the provision of public goods and services. An individual's actions will be calculated by the probability that his efforts alone will make a difference. If that probability is nil, and if he is a rational person, we would expect his effort to be nil.

Constitutional choice and collective action

The analysis of Mancur Olson would lead us to conclude that undertaking collective actions to provide public goods and services such as national defence, public parks, and education is not easily accomplished. If unanimity were the only decision rule that individuals utilized to undertake collective action, most public goods would not be provided (Bator 1958). Yet, individuals do surmount the problems of collective inaction to constitute enterprises which do not rely strictly upon the voluntary consent of all who are affected. Buchanan and Tullock begin to develop a logic that a representative individual might use in attempting to establish some method for gaining the benefits of collective action (Buchanan and Tullock 1965). While many students of public administration would not immediately see the relevance of a logic of constitutional decision making for the study of public administration, we feel that it provides an essential foundation for a different approach to the field. Using this logic, public agencies are not viewed simply as bureaucratic units which perform those services which someone at the top instructs them to perform. Rather, public agencies are viewed as means for allocating decision-making capabilities in order to provide public goods and services responsive to the preferences of individuals in different social contexts.

A constitutional choice is simply a choice of decision rules for making future collective decisions. Constitutional choice, as such, does not include the appropriation of funds or actions to alter events in the world except to provide the organisational structure for ordering the choices of future decision makers. A representative individual wanting to create an organization to provide a public good would, according to Buchanan and Tullock, need to take two types of costs into account: (1) external costs – those costs which an individual expects to bear as the result of decisions which deviate from his preferences and impose costs upon him – and (2) decision-making costs – the expenditure of resources, time, effort, and opportunities foregone in decision making (Buchanan 1969).

Both types of costs are affected by the selection of decision rules which specify the proportion of individuals required to agree prior to future collective action (Tiebout and Warren 1961).

Expected external costs will be at their highest point where any one person can take action on behalf of the entire collectivity. Such costs would decline as the proportion of members participating in collective decision making increases. Expected external costs would reach zero where all were required to agree prior to collective action under a rule of unanimity. However, expected decision-making costs would have the opposite trend. Expenditures on decision making would be minimal if any one person could make future collective decisions for the whole group of affected individuals. Such costs would increase to their highest point with a rule of unanimity.

If our representative individual were a cost minimizer, and the two types of costs described above were an accurate representation of the costs he perceives, we would expect him to prefer the constitutional choice of a decision rule where the two cost curves intersect. When the two cost curves are roughly symmetrical,

some form of simple majority vote would be a rational choice of a voting rule. If expected external costs were far greater than expected decision-making costs, an extraordinary majority would be a rational choice of a voting rule. On the other hand, if the opportunity costs inherent in decision making were expected to be very large in comparison to external costs, then reliance might be placed on a rule authorizing collective action by the decision of one person in the extreme case requiring rapid response. An optimal set of decision rules will vary with different situations, and we would not expect to find one good rule that would apply to the provision of all types of public goods and services.

Majority vote and the expression of social preferences

Scholars in the public choice tradition have also been concerned with the effect of decision rules upon the expression of individual preferences regarding the social welfare of a community of individuals (Arrow 1963; Bowen 1943; Bradford 1970; Downs 1960). Particular attention has been paid to majority vote as a means of expressing such preferences (Downs 1957; Farquharson 1969; Hinich, Ordeshook 1970; Plott 1967; Riker 1958; 1962; Rothenberg 1970). Duncan Black in *The Theory of Committees and Elections* has demonstrated that if a community is assumed to have a single-peaked preference ordering, then a choice reflecting the median preference position will dominate all others under majority vote, providing the numbers are odd (Black 1958; Black and Newing 1951). Edwin Haefele and others have pointed out that this solution has interesting implications for the strategy of those who must win the approval of an electorate (Davis and Hinich 1966; 1967; Haefele 1972). If representatives are aware of their constituents' preferences, the task of developing a winning coalition depends upon the formulation of a program that will occupy the median position of voter preferences, providing that voters are making a choice between two alternatives. Under these circumstances, persons in political or administrative leadership would have an incentive to formulate a program oriented to the median preference position of their constituents. Voters would then choose the alternative, if presented with a choice, which most closely approximates the median position (Downs 1961; Hotelling 1929). Single peakedness implies a substantial homogeneity in social preference with the bulk of preferences clustering around a single central tendency. Such conditions might reasonably apply to a public good for which there is a relatively uniform demand in relation to any particular community of interest. Substantial variations in demand for different mixes of public goods, as might be reflected in the differences between wealthy neighbourhoods and ghetto neighbourhoods in a big city, would most likely not meet the condition of single peakedness when applied to the provision of educational services, police services, or welfare services. Majority voting under such conditions would fail to reflect the social preference of such diverse neighbourhoods if they were subsumed in the same constituency.

Bureaucratic organization

If the essential characteristic of a bureaucracy is an ordered structure of authority where command is unified in one position and all other positions are ranked in a series of one-many relationships, then we would assume from the Buchanan and Tullock cost calculus that a constitutional system based exclusively upon a bureaucratic ordering would be an extremely costly affair. Presumably, an ordered system of one-man rule might sustain considerable speed and dispatch in some decision making. However, the level of potential deprivations or external social costs would be very high. If external costs can be reduced to a low order of magnitude, then reliance upon a bureaucratic ordering would have considerable advantage.

The possibility of reducing expected external costs to a low order of magnitude so that advantage might be taken of the low decision costs potentially inherent in a bureaucratic ordering can be realized only if (1) appropriate decision-making arrangements are available to assure the integrity of substantial unanimity at the level of constitutional choice, and (2) methods of collective choice are continuously available to reflect the social preferences of members of the community for different public goods and services. The rationale for bureaucratic organization in a democratic society can be sustained only if both of these conditions are met.

In the political economy tradition, two different approaches have been taken in the analysis of bureaucratic organisations. R. H. Coase in an article on 'The Nature of a Firm' has developed an explanation for bureaucratic organization in business firms (Coase 1937). According to Coase, rational individuals might be expected to organise a firm where management responsibilities would be assumed by an entrepreneur, and others would be willing to become employees if the firm could conduct business under direction of the entrepreneur at a lesser cost than if each and every transaction were to be organised as market transactions. The firm would be organised on the basis of long-term employment contracts, rather than short-term market transactions. Each employee would agree, for certain remuneration, to work in accordance with the directions of an entrepreneur within certain limits. The employment contract is analogous to a constitution in defining decision-making arrangements between employer and employee.

Coase anticipates limits to the size of firms where the costs of using a factor of production purchased in the market would be less than adding a new component to the firm to produce that added factor of production. As more employees are added, management costs would be expected to increase. A point would be reached where the saving on the marginal employee would not exceed the added costs of managing that employee. No net savings would accrue to the entrepreneur. If a firm became too large, an entrepreneur might also fail to see some of his opportunities and not take best advantage of potential opportunities in the reallocation of his work force. Another entrepreneur with a smaller, more efficient firm would thus have a competitive advantage over the larger firm which had exceeded the limit of scale economy in firm size.

Gordon Tullock in *The Politics of Bureaucracy* develops another analysis using a model of 'economic man' to discern the consequences which can be expected

to follow from rational behavior in large public bureaucracies (Tullock 1965). Tullock's 'economic man' is an ambitious public employee who seeks to advance his career opportunities for promotions within the bureaucracy. Since career advancement depends upon favourable recommendations by his superiors, a career-oriented public servant will act so to please his superiors. Favourable information will be forwarded; unfavourable information will be repressed. Distortion of information will diminish control and generate expectations which diverge from events sustained by actions (Niskanen 1970). Large-scale bureaucracies will, thus, become error prone and cumbersome in adapting to rapidly changing conditions. Efforts to correct the malfunctioning of bureaucracies by tightening control will simply magnify errors.

Coase's analysis would indicate that elements of bureaucratic organization can enhance efficiency if the rule-making authority of an entrepreneur is constrained by mutually agreeable limits and he is free to take best advantage of opportunities in reallocating work assignments within those constraints. Both Coase and Tullock recognize limits to economies of scale in bureaucratic organization (Williamson 1967). No such limits were recognized in the traditional theory of public administration. Bureaucratic organization is as subject to institutional weaknesses and institutional failures as any other form of organisational arrangement.

Producer performance and consumer interests in the provision of public goods and services

The problem of collective inaction can be overcome under somewhat optimal conditions provided that (1) substantial unanimity can be sustained at the level of constitutional choice, (2) political and administrative leadership is led to search out median solutions within a community of people which has a single-peaked order of preferences, and (3) a public service can be produced by an enterprise subject to those constraints. Some difficult problems will always remain to plague those concerned with the provision of public goods and services.

Once a public good is provided, the absence of an exclusion principle means that each individual will have little or no choice but to take advantage of whatever is provided unless he is able to move or is wealthy enough to provide for himself (Tiebout 1956). Under these conditions, the producer of a public good may be relatively free to induce savings in production costs by increasing the burden or cost to the user or consumer of public goods and services. Shifts of producer costs to consumers may result in an aggregate loss of efficiency, where the savings on the production side are exceeded by added costs on the consumption side. Public agencies rarely, if ever, calculate the value of users' time and inconvenience when they engage in studies of how to make better use of their employees' time. What is the value of the time of citizens who stand in line waiting for service as against the value of a clerk's time who is servicing them? (Kafoglis 1968; Warren 1970; Weschler, Marr and Hackett 1968). If the citizen has no place else to go and if he is one in a million other citizens, the probability of his interest being taken into account is negligible. The most impoverished members of a community are the

most exposed to deprivations under these circumstances. A preoccupation with producer efficiency in public administration may have contributed to the impoverishment of ghettos.

This problem is further complicated by conditions of changing preferences among any community of people and the problem of changing levels of demand in relation to the available supply of a public good or service. No one can know the preferences or values of other persons apart from giving those persons an opportunity to express their preferences or values. If constituencies and collectivities are organised in a way that does not reflect the diversity of interests among different groups of people, then producers of public goods and services will be taking action without information as to the changing preferences of the persons they serve. Expenditures may be made with little reference to consumer utility. Producer efficiency in the absence of consumer utility is without meaning. Large per capita expenditures for educational services which are not conceived by the recipients to enhance their life prospects may be grossly unproductive. Education can be a sound investment in human development only when individuals perceive the effort as enhancing their life prospects.

Similar difficulties may be engendered when conditions of demand for a public good or service increase in relation to the available supply. When demands begin to exceed supply, the dynamics inherent in 'the tragedy of the commons' may arise all over again (Mohring 1970; Nelson 1962; Rothenberg 1970; Seneca 1970; Williamson 1966). A congested highway carries less and less traffic as the demand grows. What was once a public good for local residents may now become a public 'bad' as congested and noisy traffic precludes a growing number of opportunities for the use of streets by local residents (Buchanan 1970). In short, the value of public goods may be subject to serious erosion under conditions of changing demand.

Finally, producer performance and consumer interests are closely tied together when we recognize that the capacity to levy taxes, to make appropriate expenditure decisions, and to provide the necessary public facilities are insufficient for optimality in the use of public facilities. One pattern of use may impair the value of a public facility for other patterns of use. The construction of a public street or highway, for example, would be insufficient to enhance the welfare potential for members of a community without attention to an extensive body of regulations controlling the use of such facilities by pedestrian and vehicular traffic. As demand for automobile traffic turns streets into a flood of vehicles, who is to articulate the interests of pedestrians and other potential users, and allocate the good among all potential users?

The interests of the users of public goods and services will be taken into account only to the extent that producers of public goods and services stand exposed to the potential demands of those users. If producers fail to adapt to changing demands or fail to modify conditions of supply to meet changing demands, then the availability of alternative administrative, political, judicial, and constitutional remedies may be necessary for the maintenance of an efficient and responsive system of public administration. Efficiency in public administrations will depend

upon the sense of constitutional decision making that public administrators bring to the task of constituting the conditions of public life in a community.

Most political economists in the public choice tradition would anticipate that no single form of organization is good for all social circumstances (Ashby 1962; 1960). Different forms of organization will give rise to some capabilities and will be subject to other limitations. Market organization will be subject to limitations which will give rise to institutional weaknesses or institutional failure. Bureaucratic organization will provide opportunities to develop some capabilities and will be subject to other limitations. Those limitations will in turn generate institutional weakness or institutional failure if they are exceeded. A knowledge of the capabilities and limitations of diverse forms of organisational arrangements will be necessary for both the future study and practice of public administration.

Toward new perspectives in the study of public administration

Our prior analysis has been largely, though not exclusively, oriented toward a circumstance involving calculations relative to the provision of a single public good. If we proceed with an assumption that we live in a world involving a large variety of potential public goods which come in different shapes and forms, we may want to consider what our representative individual as a self-interested calculator pursuing maximizing strategies would search out as an appropriate way for organising an administrative system to provide an optimal mix of different public goods and services. Would a representative individual expect to get the best results by having all public goods and services provided by a single integrated bureaucratic structure subject to the control and direction of a single chief executive? Or would he expect to get better results by having access to a number of different collectivities capable of providing public services in response to a diversity of communities of interest? (Bish 1968; Duggal 1966; Haefele 1970; Hirschman 1967; McKean 1965; Pauly 1970).

If the answer to the first question is 'no' then the presumptions inherent in Wilson's theory of administration and in the traditional principles of public administration will not stand as a satisfactory basis for a theory of administration in a democratic society. If the answer to the second question is 'yes' then we are confronted with the task of developing an alternative theory of public administration that is appropriate for citizens living in a democratic society (Lindblom 1965).

If a domain that is relevant to the provision of a public good or service can be specified so that those who are potentially affected can be contained within the boundaries of an appropriate jurisdiction and externalities do not spill over onto others, then a public enterprise can be operated with substantial autonomy, provided that an appropriate structure of legal and political remedies are available to assure that some are not able to use the coercive powers of a collectivity to deprive others of unlawful rights or claims (Hirsch 1968; 1963). Even where such conditions could not be met, solutions can be devised by reference to overlapping jurisdictions so that the larger jurisdictions are able to control for externalities while allowing substantial autonomy for the same people organised as small collectivities to make provision for their own public welfare.

In the traditional theory of public administration, the existence of overlapping jurisdictions has often been taken as *prima facie* evidence of duplication of effort, inefficiency, and waste. If we contemplate the possibility that different scales of organization may be appropriate to different levels of operation in providing a particular type of public service, substantial advantage may derive from the provision of services by overlapping jurisdictions (Dawson 1970; Hirsch 1964; Williams 1966). For example, local police may not be very proficient in dealing with organised crime operating on a state, interstate, national, or international basis. Large-scale national police agencies may be a necessary but not sufficient condition for dealing with such problems. Control over the movement of traffic in and out of urban centres may pose problems of an intermediate scale in policing operations. Crimes in the street, however, may reflect the absence of police services responsive to local neighbourhood interests.

Once we contemplate the possibility that public administration can be organised in relation to diverse collectivities organised as concurrent political regimes, we might further contemplate the possibility that there will not be one rule of good administration for all governments alike. Instead of a single integrated hierarchy of authority coordinating all public services, we might anticipate the existence of multi-organisational arrangements in the public sector that tends to take on the characteristics of public-service industries composed of many public agencies operating with substantial independence of one another (Ostrom and Ostrom 1965). Should we not begin to look at the police industry, (Ostrom 1971; Shoup 1964) the education industry, (Barlow 1970; Holtmann 1966; Machlup 1962) the water industry, (Bain, Caves and Margolis 1966; Schmid 1967; Weschler 1968) and other public service industries on the assumption that these industries have a structure that allows for coordination without primary reliance upon hierarchical structures? (Warren 1966). Once we begin to look for order among multi-organisational arrangements in the public sector, important new vistas will become relevant to the study of public administration (Bish 1971). So-called grants-in-aid may take on the attributes of a transfer of funds related to the purchase of a mix of public services to take appropriate account of externalities which spill over from one jurisdiction to another (Breton 1971; Weldon 1966).

A combination of user taxes, service charges, intergovernmental transfers of funds, and voucher systems may evoke some of the characteristics of market arrangements among public service agencies (Breton 1967; Buchanan 1968; Dales 1968; Ostrom 1969; Tiebout and Warren 1961). Instead of a bureaucratic hierarchy serving as the primary means for sustaining legal rationality in a political order as Max Weber has suggested, we should not be surprised to find that legal rationality can be sustained by recourse to judicial determination of issues arising from conflicts over jurisdiction among administrative agencies. Given the high potential cost of political stalemate for the continuity and survival of any administrative enterprise, we should not be surprised to find rational, self-interested public administrators consciously bargaining among themselves and mobilizing political support from their clientele in order to avoid political stalemate and sustain the

political feasibility of their agencies (Lindblom 1955). Perhaps a system of public administration composed of a variety of multi-organisational arrangements and highly dependent upon mobilizing clientele support will come reasonably close to sustaining a high level of performance in advancing the public welfare.

References

- Arrow, K. F. (1951) 'Alternative Approaches to the Theory of Choice in Risk-Taking Situations', *Econometrica*, 19:404–437.
- (1963) *Social Choice and Individual Values*, 2nd edition, New York: John Wiley & Sons.
- Ashby, W. R. (1962) 'Principles of the Self-Organising System', in H. Von Foerster and G. W. Zopf (eds) *Principles of Self-Organization*, New York: The Macmillan Co., pp. 255–278.
- (1960) *Design for a Brain*, 2nd edition, New York: John Wiley & Sons.
- Ayres, R. U. and Kneese, A. V. (1969) 'Production, Consumption and Externalities', *American Economic Review*, 59:282–297.
- Bain, J. S., Caves, R. E. and Margolis, J. (1966) *Northern California's Water Industry: The Comparative Efficiency of Public Enterprise in Developing a Scarce Natural Resource*, Baltimore: The Johns Hopkins Press.
- Barlow, R. (1970) 'Efficiency Aspects of Local School Finance', *Journal of Political Economy*, 78:1028–1040.
- Bator, F. (1958) 'The Anatomy of Market Failure', *Quarterly Journal of Economics*, LXXII:351–379.
- Bish, R. L. (1968) 'A Comment on V. P. Duggal's "Is There an Unseen Hand in Government?"', *Annals of Public and Cooperative Economy*, XXXIX:89–94.
- (1971) *The Public Economy of Metropolitan Areas*, Chicago: Markham Publishing Company.
- Black, D. (1958) *The Theory of Committees and Elections*, Cambridge: Cambridge University Press.
- Black, D. and Newing, R. A. (1951) *Committee Decisions with Complementary Valuation*, London: William Hodge.
- Boulding, K. E. (1966) 'The Ethics of Rational Decision', *Management Science*, 12:161–169.
- (1963) 'Towards a Pure Theory of Threat Systems', *American Economic Review*, 53: 424–434.
- Bowen, H. R. (1943) 'The Interpretation of Voting in the Allocation of Economic Resources', *Quarterly Journal of Economics*, LVIII: 27–48.
- Bradford, D. V. (1970) 'Constraints on Public Action and Rules for Social Decision', *American Economic Review*, 60:642–654.
- Breton, A. (1966) 'A Theory of the Demand for Public Goods', *Canadian Journal of Economics and Political Science*, XXXII:455–467.
- (1967) *Discriminatory Government Policies in Federal Countries*, Montreal: The Canadian Trade Committee, Private Planning Association of Canada.
- (1965) 'A Theory of Government Grants', *Canadian Journal of Economics and Political Science*, XXXI:175–187.
- Brodebeck, M. (1958) 'Methodological Individualism: Definition and Reduction', *Philosophy of Science*, 25:1–22.

- Buchanan, J. M. (1968) 'A Public Choice Approach to Public Utility Pricing', *Public Choice*, 5:1–17.
- (1969) *Cost and Choice: An Inquiry in Economic Theory*, Chicago: Markham Publishing Company.
- Buchanan, J. M. and Stubblebine, W. C. (1962) 'Externality', *Economica*, XXIX:371–384.
- (1970) 'Public Goods and Public Bads' in J. P. Crecine (ed.), *Financing the Metropolis*, Beverly Hills: Sage Publications.
- Buchanan, J. M. and Tullock, G. (1965) *The Calculus of Consent: Logical Foundations of Constitutional Democracy*, Ann Arbor, MI: University of Michigan Press.
- (1968) *The Demand and Supply of Public Goods*, Chicago: Rand McNally.
- Burgess, P. M. and Robinson, J. A. (1969) 'Alliances and the Theory of Collective Action: A Simulation of Coalition Processes', *Midwest Journal of Political Science*, XII:194–219.
- Campbell, C. D. and Tullock, G. (1965) 'A Measure of the Importance of Cyclical Majorities', *Economic Journal*, 75:853–857.
- (1966) 'The Paradox of Voting: A Possible Method of Calculation', *American Political Science Review*, LX:684–685.
- Coase, R. H. (1937) 'The Nature of the Firm', *Economica*, 4: 386–485.
- (1960) 'The Problem of Social Cost', *Journal of Law and Economics*, III:1–44.
- Coleman, J. S. (1966a) 'Foundations for a Theory of Collective Decisions', *American Journal of Sociology*, 71:615–627.
- (1966b) 'Individual Interests and Collective Action', *Papers on Non-Market Decision Making*, 1:49–63.
- Cunningham, R. L. (1967) 'Ethics and Game Theory: The Prisoners Dilemma', *Papers on Non-Market Decision Making*, 2:11–26.
- Cyert, R. M. and March, J. G. (1963) *A Behavioral Theory of the Firm*, Englewood Cliffs, NJ: Prentice Hall.
- Dales, J. H. (1968) *Pollution, Property and Prices: An Essay in Policy-Making and Economics*, Toronto: University of Toronto Press.
- Davis, O. A. and Hinich, M. (1966) 'A Mathematical Model of Policy Formation in a Democratic Society', *Mathematical Applications in Political Science*, 11:175–208.
- (1967) 'Some Results Related to a Mathematical Model of Policy Formation in a Democratic Society', *Mathematical Applications and Political Science*, III:14–38.
- Davis, O. A., Hinich, M. and Winston, A. (1962) 'Externalities, Welfare and the Theory of Games', *Journal of Political Economy*, 60: 241–262.
- (1967) 'On the Distinction Between Public and Private Goods', *American Economic Review*, 57:360–373.
- Dawson, D. A. (1970) *Economies of Scale in the Public Secondary School Education Sector in Ontario*, Hamilton, Ontario: McMaster University, Department of Economics, Working Paper No. 70–04.

- Demsetz, H. (1967) 'Private Property, Information and Efficiency', *American Economic Review*, LVII:347–360.
- (1970) 'The Private Production of Public Goods', *Journal of Law and Economics*, XII:293–306.
- Downs, A. (1957) *An Economic Theory of Democracy*, New York: Harper & Row.
- (1961) 'In Defence of Majority Voting', *Journal of Political Economy*, LXIX: 192–199.
- (1960) 'Why the Government Budget is Too Small in a Democracy', *World Politics*, XII:541–564.
- Duggal, V. P. (1966) 'Is There an Unseen Hand in Government?', *Annals of Public and Comparative Economy*, 37:145–150.
- Eulau, H. (1964) 'Logic of Rationality in Unanimous Decision Making', in C. J. Friedrich (ed.) *Nomos VII: Rational Decision*, New York: Atherton Press, pp. 26–5.
- Farquharson, R. (1969) *Theory of Voting*, New Haven: Yale University Press.
- Fishburn, P. C. (1964) *Decision and Value Theory*, New York: John Wiley & Sons, Inc.
- Garvey, G. (1969) 'The Political Economy of Patronal Groups', *Public Choice*, VII:33–45.
- (1966) 'The Theory of Party Equilibrium', *American Political Science Review*, LX:29–38.
- Gulick, L. and Urwick, L. (eds) (1937) *Papers on the Science of Administration*, New York: Columbia University, Institute of Public Administration.
- Haefele, E. T. (1970) 'Coalitions, Minority Representation, and Vote-Trading Probabilities', *Public Choice*, VII:75–90.
- (1972) 'Environmental Quality as a Problem of Social Choice' in *Environmental Quality Analysis: Theory and Method in the Social Sciences*, Washington D.C.
- Hardin, G. (1968) 'The Tragedy of the Commons', *Science*, 162:1243–1248.
- Hart, A. G. (1965) *Anticipations, Uncertainty and Dynamic Planning*, New York: Augustus M. Kelley.
- Head, J. G. (1962) 'Public Goods and Public Policy', *Public Finance*, 17: 197–219.
- Hinich, M. J. and Ordeshook, P. (1970) 'Plurality Maximization vs. Vote Maximization: A Spatial Analysis with Variable Participation', *American Political Science Review*, 64:772–791.
- Hirsch, W. Z. (1963) 'Urban Government Services and Their Financing' in W. Z. Hirsch (ed.) *Urban Life and Form*, New York: Holt, Rinehart and Winston, pp. 129–166.
- (1964) 'Local Versus Areawide Urban Government Services', *National Tax Journal*, 17:331–339.
- (1968) 'The Supply of Urban Public Services' in H. S. Perloff and L. Wingo (eds) *Issues in Urban Economics*, Baltimore: Johns Hopkins Press, pp. 477–526.
- Hirschman, A. O. (1967) 'The Principles of the Hiding Hand', *The Public Interest*, 6.

- Hirshleifer, J., DeHaven, J. C. and Millman, J. W. (1960) *Water Supply Economics, Technology, and Policy* Chicago: The University of Chicago Press.
- Holtmann, A. G. (1966) 'A Note on Public Education and Spillovers through Migration', *Journal of Political Economy*, 74:524–525.
- Hotelling, H. (1929) 'Stability in Competition' *Economic Journal*, 39:41–57.
- Kafoglis, M. L. (1968) 'Participatory Democracy in the Community Action Program', *Public Choice*, V:73–85.
- Knight, F. H. (1965) *Risk, Uncertainty and Profit*, New York: Harper and Row.
- Leoni, B. (1957) 'The Meaning of "Political" in Political Decisions', *Political Studies*, V:225–239.
- Lindblom, C. E. (1955) *Bargaining: The Hidden Hand in Government*, Santa Monica: The Rand Corporation.
- (1965) *The Intelligence of Democracy: Decision Making through Mutual Adjustment*, New York: The Free Press, 1965.
- Luce, R. D. and Raiffa, H. (1957) *Games and Decisions: Introduction and Critical Survey*, New York: John Wiley & Sons.
- McKean, R. L. (1965) 'The Unseen Hand in Government', *American Economic Review*, 55:496–506.
- Machlup, F. (1962) *The Production and Distribution of Knowledge in the U.S.*, Princeton, NJ: Princeton University Press.
- Mishan, E. J. (1967) *The Costs of Economic Growth*, New York: Frederick A. Praeger.
- Mohring, H. (1970) 'The Peak Load Problem with Increasing Returns and Pricing Constraints', *American Economic Review*, 60:693–705.
- Musgrave, R. (1939) 'The Voluntary Exchange Theory of Public Economy', *QJE*, LIII:213–237.
- (1959) *The Theory of Public Finance*, New York: McGraw-Hill.
- Nelson, J. C. (1962) 'The Pricing of Highway, Waterway, and Airway Facilities', *American Economic Review*, 52:426–435.
- Niskanen, W. A. (1970) *Bureaucracy and Representative Government*, review draft, Arlington, Va.: Institute for Defence Analysis.
- Olson, M. (1965) *The Logic of Collective Action*, Cambridge, Mass.: Harvard University Press.
- Ostrom, E. (1971) 'Institutional Arrangements and the Measurement of Policy Consequences in Urban Affairs', *Urban Affairs Quarterly*.
- (1968) 'Some Postulated Effects of Learning on Constitutional Behavior', *Public Choice*, V:87–104.
- Ostrom, V. and Ostrom E. (1965) 'A Behavioural Approach to the Study of Intergovernmental Relations', *Annals of the American Academy of Political and Social Science*, 359:137–146.
- Ostrom, V. (1969) 'Operational Federalism: Organization for the Provision of Public Services in the American Federal System', *Public Choice*, VI:1–17.
- Ostrom, V., Tiebout, C. M. and Warren, R. (1961) 'The Organization of Government in Metropolitan Areas: A Theoretical Inquiry', *American Political Science Review*, 55:831–842.

- (1968) 'Water Resource Development: Some Problems in Economic and Political Analysis of Public Policy' in A. Ranney (ed.) *Political Science and Public Policy*, Chicago: Markham Publishing Company.
- Pauly, M. V. (1970) 'Optimality, "Public Goods and Local Governments: A General Theoretical Analysis"', *Journal of Political Economy*, 78:572–585.
- Phelps, E. (1965) *Private Wants and Public Needs*, New York: W. W. Norton.
- Plott, C. R. (1967) 'A Notion of Equilibrium and its Possibility Under Majority Rule', *American Economic Review*, 57:787–806.
- Radner, R. (1970) 'Problems in the Theory of Markets under Uncertainty', *American Economic Review*, LX:454–460.
- Ridley, C. E. and Simon, H. A. (1938) *Measuring Municipal Activities*, Chicago: The International City Manager's Association.
- Riker, W. H. (1958) 'The Paradox of Voting and Congressional Rules for Voting on Amendments', *American Political Science Review*, 52:349–366.
- (1962) *The Theory of Political Coalitions*, New Haven: Yale University Press.
- (1965) 'Arrow's Theorem and Some Examples of the Paradox of Voting', *Mathematical Applications in Political Science*, I.
- Rothenberg, J. (1970) 'The Economics of Congestion and Pollutions: An Integrated View', *American Economic Review*, LX:114–121.
- Samuelson, P. A. (1955) 'Diagrammatic Exposition of a Theory of Public Expenditure', *Review of Economics and Statistics*, XXXVII:350–356.
- (1954) 'The Pure Theory of Public Expenditure', *Review of Economics and Statistics*, XXXVI: 387–389.
- Schmid, A. A. (1967) 'Nonmarket Values and Efficiency of Public Investments in Water Resources', *American Economic Review*, LVII:158–168.
- Seneca, J. J. (1970) 'The Welfare Effects of Zero Pricing of Public Goods', *Public Choice*, VII:101–110.
- Schelling, T. C. (1963) *The Strategy of Conflict*, Cambridge, Mass.: Harvard University Press.
- Shackle, G. L. S. (1961) *Decision, Order and Time in Human Affairs*, Cambridge, England: Cambridge University Press.
- Shoup, C. S. (1964) 'Standard for Distributing of Free Government Service: Crime Prevention', *Public Finance*, 19:383–392.
- Simon, H. A. (1957) *Models of Men, Social and Rational*, New York: Wiley and Sons.
- (1959) 'Theories of Decision-Making in Economics and Behavioural Science', *American Economic Review*, XLIX:253–283.
- (1962) 'The Architecture of Complexity', *Proceedings of the American Philosophical Society*, 106:467–482.
- (1964) *Administrative Behavior: A Study of Decision-Making Processes in Administrative Organisations*, New York: Macmillan.
- (1969) 'The Sciences of the Artificial', Cambridge, Mass.: The M.I.T. Press.

- Stigler, G. J. (1961) 'The Economics of Information', *Journal of Political Economy*, LXIX:213–225.
- Thompson, E. A. (1966) 'A Pareto-Optimal Group Decision Process', *Papers on Non-Market Decision Making*, I:133–140.
- Thompson, W. (1968) 'The City as a Distorted Price System', *Psychology Today*, pp. 28–33.
- Tiebout, C. M. (1956) 'A Pure Theory of Local Expenditures', *Journal of Political Economy*, 64:416–424.
- Tullock, G. (1970) 'A Simple Algebraic Logrolling Model', *American Economic Review*, LX:419–426.
- (1965) *Politics of Bureaucracy*, Washington, D.C.: The Public Affairs Press.
- (1967) 'The General Irrelevance of the General Impossibility Theorem', *Quarterly Journal of Economics*, 81:256–270.
- U.S. Congress, Joint Economic Committee, Subcommittee on Economy in Government, (1969) *A Compendium of Papers on the Analysis and Evaluation of Public Expenditures: The PPB System*, three volumes, Washington, D.C.: U.S. Government Printing Office.
- Wade, L. L. and Curry, R. L., Jr. (1970) *A Logic of Public Policy: Aspects of Political Economy*, Belmont, Calif.: Wadsworth Publishing Company.
- Waldo, D. (1968) 'Scope of the Theory of Public Administration' in J. C. Charlesworth (ed.) *Theory and Practice of Public Administration: Scope Objectives, and Methods*, Philadelphia: The American Academy of Political and Social Science.
- Warren, R. (1970) 'Federal-Local Development Planning: Scale Effects in Representation and Policy Making', *Public Administration Review*, XXX:584–595.
- (1966) *Government in Metropolitan Regions: A Reappraisal of Fractionated Political Organization*, Davis, Calif.: University of California, Davis, Institute of Governmental Affairs.
- Weldon, J. C. (1966) 'Public Goods and Federalism', *Canadian Journal of Economics and Political Science*, 32:230–238.
- Weschler, L. F., Marr, P. D. and Hackett, B. M. (1968) *California Service Centre Program*, Davis, Calif.: University of California, Davis, Institute of Governmental Affairs.
- (1968) *Water Resources Management: The Orange County Experience*, Davis, Calif.: University of California, Davis, Institute of Governmental Affairs.
- Wheeler, H. J. (1967) 'Alternative Voting Rules and Local Expenditures: The Town Meeting vs. City', *Papers on Non-Market Decision Making*, 2:61–70.
- White, L. D. (1926) *Introduction to the Study of Public Administration*, New York: The Macmillan Company.
- Wildovsky, A. (1966) 'The Political Economy of Efficiency', *Public Administration Review*, XXVI: 292–310.
- Williams, A. (1966) 'The Optimal Provision of Public Goods in a System of Local Government', *Journal of Political Economy*, 74:18–33.

- Williamson, O. E. (1967) 'Hierarchical Control and Optimum Firm Size', *Journal of Political Economy*, 75:123–138.
- (1966) 'Peak Load Pricing and Optimal Capacity under Indivisibility Constraints', *American Economic Review*, LVI:810–827.
- Wilson, W. (1887) 'The Study of Administration', *Political Science Quarterly*, II:197–222.