

Research Notes

A Game Theoretical Approach to the Legislative Process

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The American legislative process has been a favorite object of study for political scientists, and for good reason. The Congress has been especially popular, in part because it continues to occupy a critical position in the making of public policy, notwithstanding frequent disagreements over precisely how this position should be defined *vis-à-vis* the president, the bureaucracy, and other formal and informal groups. But the attraction of studying the Congress does not rest solely on its importance as an institution of American government. It is attractive for political analysis also because of the variety of methodological and theoretical approaches which may be applied to it, with apparent ease and success. Some aspects of the legislative process are susceptible to investigation only by relying on interviews, personal observations, memoirs, and official documents. Other aspects of Congressional behavior lend themselves well to quantification, within limits commonly acknowledged and frequently ignored. Theories of integration, roles, communication, decision-making, and intra- and inter-organizational behavior have all provided complementary perspectives on the same institution. The study of Congress has not been defined or narrowed in a way which effectively precludes the potential applicability of any methods and approaches favored by political scientists.

The result has been that we probably know more about the Congress than about any other political institution in the world. In fact, our current problem may not be one of ignorance, but of inadequate conceptualization—a failure to integrate all that we do know into a schema with some claim to closure and elegance. The preliminary development of such a schema is offered here, with the hope that other students of politics generally and of the Congress specifically will be encouraged to elaborate it further.

In recent years, an increasing number of political scientists have

become interested in the possible application of the principles of game theory to political behavior. Shubik, Rapoport, Leiserson, Riker, and Schelling, among others, have all applied variations of the same analytical principles to different political phenomena.¹ Their approaches are each unique in some respects, but their common characteristics have generated some controversy over the ultimate utility of such attempts. Game theoretical analysis necessarily requires a drastic oversimplification of the complexities of political behavior and events. For descriptive purposes, it demands the specification of the critical variables and the linkages among them. For analytical purposes, it may suggest relationships and consequences potentially applicable to a variety of different empirical situations.

Much of the criticism of game theory has emphasized its abstractness and its distance from observable reality. For both the student and the scholar, the principles of gaming are so unfamiliar that the political questions stimulating their application too often become lost in attempts to understand the techniques themselves. As with many of the more sophisticated methods of political analysis, there is the constant danger of the means becoming the end. The subjects of investigation are too often selected not for their intrinsic importance but for their adaptability to a particular methodological preference. Perhaps one way of avoiding this danger would be to apply to politics more familiar principles of gaming. In this way, the process of analysis may facilitate understanding without sacrificing the virtues of simplicity.

Relatively few attempts have been made to apply game theory and other related approaches to the study of Congress, with the outstanding exceptions of Shapley and Shubik² and of Luce and Rogow.³ And even their efforts are quite limited in scope and in applicability to other legislative phenomena. The schéma to be presented here is more macro-

¹Martin Shubik (editor), *Game Theory and Related Approaches to Social Behavior* (New York, N.Y.: John Wiley & Sons, Inc., 1964); Anatol Rapoport, *Fights, Games, and Debates* (Ann Arbor, Michigan: The University of Michigan Press, 1960); Michael Leiserson, "Factions and Coalitions in One-Party Japan: an explanation based on the Theory of Games" (a paper presented at the 1967 Annual Meeting of the American Political Science Association); William H. Riker, *The Theory of Political Coalitions* (New Haven, Connecticut: Yale University Press, 1962); and Thomas C. Schelling, *The Strategy of Conflict* (New York, N.Y.: Oxford University Press, 1963).

²L. S. Shapley and M. Shubik, "A Method for Evaluating the Distribution of Power in a Committee System," *American Political Science Review*, XLVIII (1954), pp. 787-792.

³R. D. Luce and A. A. Rogow, "A Game Theoretic Analysis of Congressional Power Distributions for a Stable Two-Party System," *Behavioral Science*, I-II (April, 1956), pp. 83-95.

scopic in focus, combining the principles of gaming with a vision more characteristic of Downs⁴ and of the more recent work of Frohlich, Oppenheimer, and Young.⁵

The utility of this schema may be demonstrated by applying it specifically to the annual process of national fiscal appropriations. This involves a complex pattern of interactions among the president, executive agency officials, nongovernmental groups, Congressional party leaders, and the members of the Appropriations (and, more indirectly, the substantive) committees of both Houses of the Congress. Different aspects of this process have been described in acute detail, especially by Fenno⁶ and Wildavsky.⁷ In what follows, I shall be relying solely on analyses and descriptions already familiar to students of American national politics. My purpose is only to describe in simplified and familiar terms a process which in many ways constitutes a microcosm of the manner in which many national policy decisions are made.⁸

Therefore, consider...

⁴ Anthony Downs, *An Economic Theory of Democracy* (New York, N.Y.: Harper & Row, 1957).

⁵ Norman Frohlich, Joe A. Oppenheimer, and Oran R. Young, *Political Leadership and Collective Goods* (Princeton, New Jersey: Princeton University Press, 1971).

⁶ Richard F. Fenno, Jr., "The House Appropriations Committee as a Political System: The Problem of Integration," *American Political Science Review*, LVI (1962), pp. 310-324.

⁷ Aaron Wildavsky, *The Politics of the Budgetary Process* (Boston, Massachusetts: Little, Brown and Company, 1964). Proper scholarly obeisance is also due to Richard Fenno, *The Power of the Purse: Appropriations Politics in Congress* (Boston, Massachusetts: Little, Brown and Company, 1966)—which I have not read, and to Otto A. Davis, M. A. H. Dempster, and Aaron Wildavsky, "A Theory of the Budgetary Process," *American Political Science Review*, LV (1966), pp. 529-547—which I have read but do not understand. Also pertinent are James W. Davis, Jr. (editor), *Politics, Programs, and Budgets* (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1969); J. Leiper Freeman, *The Political Process: Executive Bureau-Legislative Committee Relations* (New York, N.Y.: Random House, Inc., 1955); Ira Sharkansky, *The Politics of Taxing and Spending* (Indianapolis, Indiana: The Bobbs-Merrill Company, Inc., 1969); Lawrence C. Pierce, *The Politics of Fiscal Policy Formation* (Pacific Palisades, California: Goodyear Publishing Company, Inc., 1971); and John L. Stromberg, *The Internal Mechanisms of The Defense Budget Process—Fiscal 1953-1968* (Santa Monica, California: The Rand Corporation, 1970). Another paper of little direct relevance but written by a friend of mine who would probably like to see his efforts noted is Arnold Kanter, "Presidential Power and Bureaucratic Compliance: Changing Organizational Objectives" (a paper presented at the 1971 Annual Meeting of the American Political Science Association).

⁸ An indefinite debt of gratitude is due to my colleagues in the Department of Political Science of the University of Massachusetts whose searching conversations sparked the genesis of this schema. Any credit relating to its political applications, however, is mine alone.

Budgeting as Football

The Parameters

- 1 season = a political era, defined crudely as the period between critical or realigning elections
- 1 game = an Administration of four years
(note: the number of games per season becomes variable)
- 1 quarter = 1 year
- 100 yards = the total amount of money available for allocation
- 1 yard = therefore, approximately \$1,000,000,000
(note: strictly, the dollar equivalent of yardage is variable; however, during any given game, the limits within which this variation occurs are restricted enough to justify our treating it as if it were constant)
- stadium = the political arena
- wind direction = the direction of events (excluding domestic economic developments) influencing but beyond the control of the players
- condition of the playing field = national economic conditions, especially the availability of revenue
- spectators = attentive publics
(note: just as the best seats are the most expensive, so too increasingly complete information on political events and the political process entails increasing costs of time, energy, money, and other resources, especially in the form of opportunity costs)
- crowd noise = intensity of opinion among attentive publics
- television viewers = inattentive publics, receiving a distorted image of the game and having less influence on its outcome, but at less cost
- television and radio announcers = the media—describing, interpreting, and focusing the attention of the inattentive publics
- officials = the federal judiciary
(note: in the political game, the officials are less likely to intervene, although retaining their formal power to do so, and penalties do not take the form of dollar-yard losses)
- sidelines = boundaries of the legitimate political process
(note: because these boundaries depend on the perceptions of the players and officials, they may be variable; but these perceptions are normally similar enough to justify our considering them as being constant)
- line of scrimmage for each play = budgetary status quo for each agency or department

first down = passage of presidential proposal

game plan = the annual budget submitted by the President to the Congress

The Players

Offensive team = the President and his supporters in Congress (designated the presidential party, even though it may include Congressional Democrats and Republicans)

Quarterback = President (P)

Running back = relevant executive agency or department

Blocking back = leader of the presidential party in the Senate (PSL)

Center = Office of Management and Budget (OMB)

Pulling guard = leader of the presidential party in the House (PHL)

Tight end = supportive interest groups and associations

Defensive team = the Congress, minus presidential supporters (designated the opposition party, even though it may include members of the same political party as the president)

Defensive end = relevant House authorization committee (H_C)

Strong side linebacker = relevant Senate authorization committee (S_C)

Middle linebacker = leader of the opposition party in the House (OHL)

Weak side linebacker = leader of the opposition party in the Senate (OSL)

Strong side defensive back = conference committee on authorization bill, whenever necessary (AuCC)

Weak side defensive back = relevant subcommittee of the Senate Appropriations Committee (SASc_)

Strong safety = relevant subcommittee of the House Appropriations Committee (HASc_)

Free safety = conference committee on appropriations bill (AppCC)

Coaching staffs = supporting voters' coalitions

Training staffs = supporting party officials and activists

Notes: Free substitution is permitted for both offensive and defensive teams between each play. During any given play, the remaining players (not listed above) are not as directly involved, except to the extent that their legislative-political activities distract attention from the budgetary process.

An Illustrative Application

Assume that we are interested in the appropriations for the Department of Agriculture during any given Fiscal Year.⁹ Therefore,

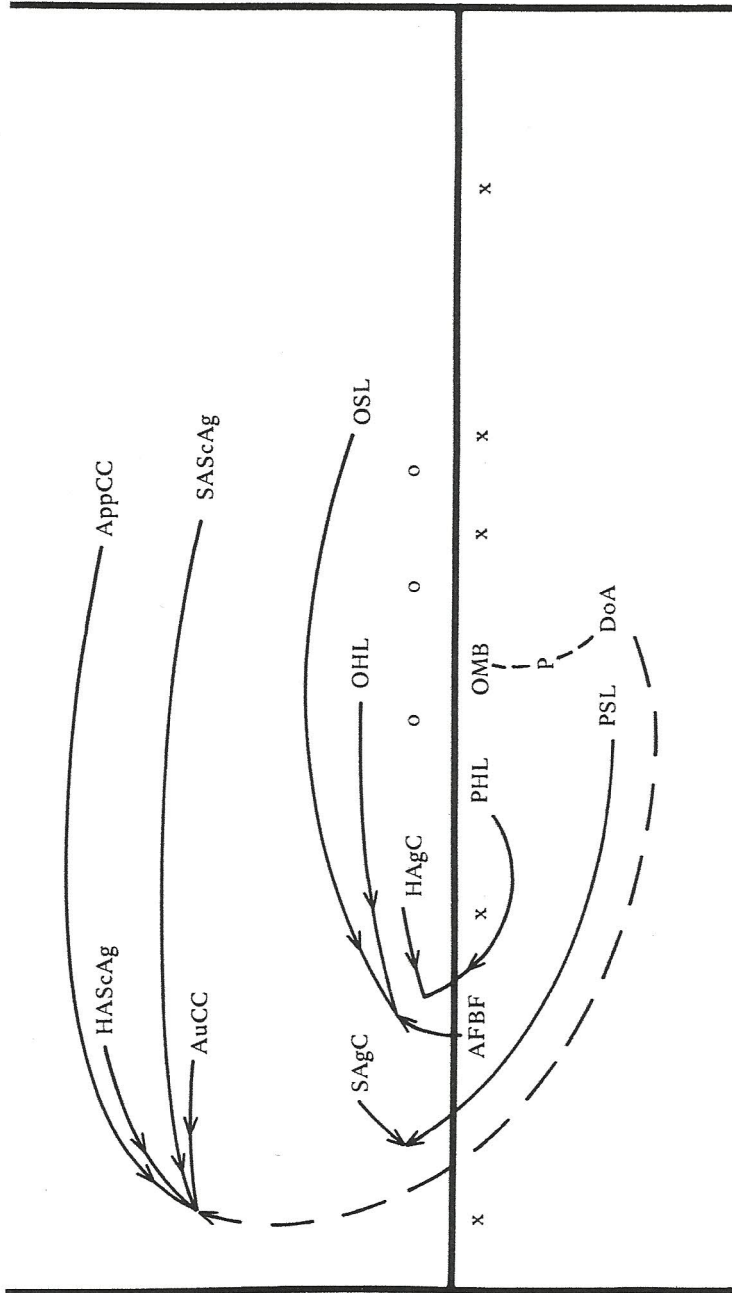
RB = DoA (Department of Agriculture)
 TE = AFBF (American Farm Bureau Federation)
 DE (H_C) = HAgC
 SLB (S_C) = SAgC
 WDB (SASc_) = SAScAg
 SS (HASc_) = HAScAg

In principle, and generally in practice also, coordination of agencies' budgetary requests is the primary function of the OMB (formerly BoB). The chief executive officials of each agency normally carry the responsibility for promoting and defending the proposed budget for their agency on behalf of the President. The leadership of the presidential party in both Houses (PHL and PSL) may be described as attempting to offset or balance the actions of the House and Senate Agriculture Committees (HAgC and SAgC) which are responsible for preliminary—and usually decisive—action on DoA programs, often including determination of the maximum level of expenditures authorized to implement them. The substantive committees of House and Senate do not generally share the “cutting bias” characteristic of the Appropriations Committees and subcommittees, but their posture is normally less innovative and expansive than the President's program as supported by the presidential party leadership in Congress.

The supportive activities of interest groups, such as the AFBF, may be expected to counteract the likelihood that opposition party leaders (OHL and OSL) in the Congress will attempt to reduce or modify DoA's budget. Even so, the successful completion of the appropriations process (from the perspective of the agency and White House) depends on the ability of the DoA's spokesmen to outmaneuver the defensive activities of the conference committee reconciling possible House and Senate differences on DoA authorization levels (AuCC), the Agriculture subcommittees of the House and Senate Appropriations Committees (HAScAg and SAScAg), and the conference committee on DoA appro-

⁹ For a more complete discussion of agricultural policy-making, see, for example, Charles O. Jones, “Representation in Congress: The Case of the House Agriculture Committee,” *American Political Science Review*, LV (June, 1961), pp. 358–367, and Theodore J. Lowi, *The End of Liberalism* (New York, New York: W. W. Norton and Company, Inc., 1969), chapter 4.

FIGURE 1¹⁰



¹⁰ Source: Chicago Cardinals vs. Pittsburgh Steelers (17 December 1938) Quarter 2, play 31.

priations (AppCC)—possibly with the further support of the Congressional leaders of the presidential party and interested public support groups. After formal submission of his budgetary proposals, direct presidential involvement on behalf of particular appropriations is normally minimal. In terms of the schema presented above, this process is depicted in Figure 1.

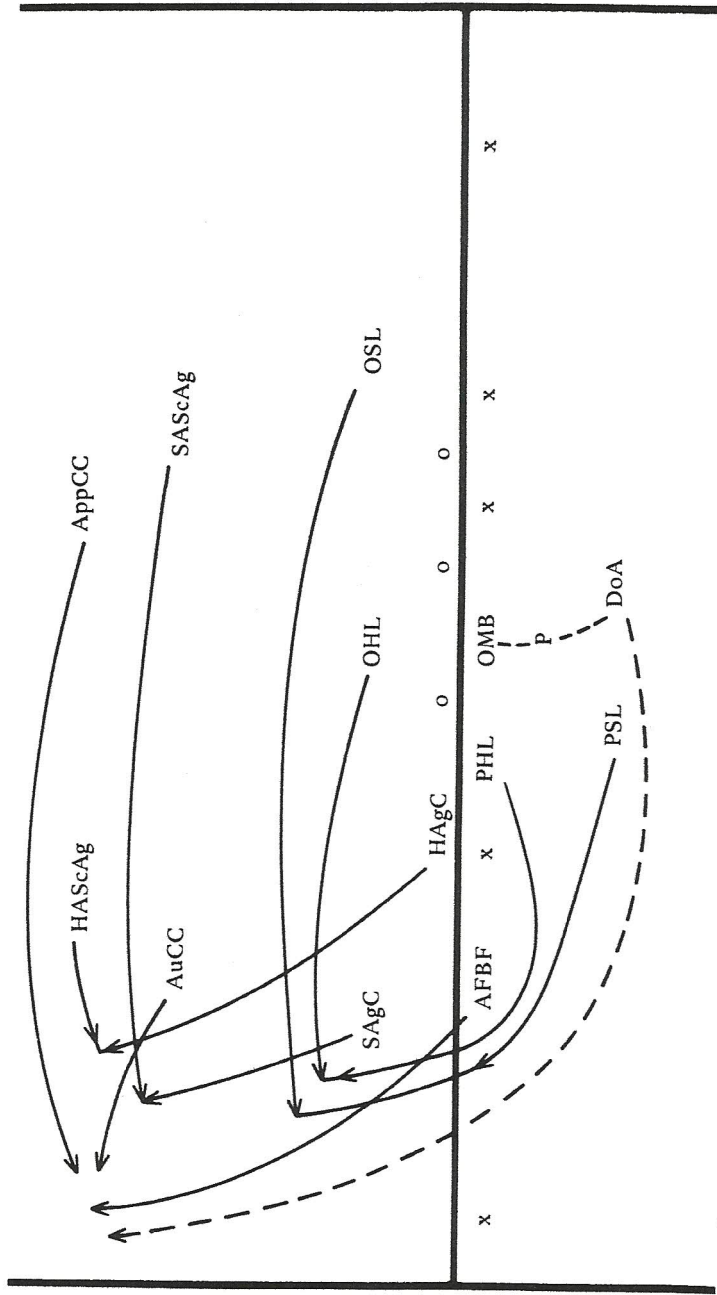
In reality, however, the process often occurs somewhat differently. In some instances, as in the case of agriculture (and the military), the substantive committees of the House and Senate become advocates of the agencies and departments whose activities they are entrusted to supervise. Their support for DoA's activities and programs, therefore, is likely to make them sympathetic to many of the authorization levels requested for the DoA by its Secretary and/or by the President (particularly those which are familiar and for which there is evidence of strong constituency and national support). This committee support may result in increased levels of authorizations which may then be cut back to a more modest level by the Appropriations sub-committees.

In terms of our schema (see Figure 2), the defensive end and strong side linebacker may become offensive players, at least counterbalancing the impact of the strong safety and weak side defensive back. The influences of the four party leaders may generally be offsetting (depending on the relative balance of party strength and activity in Congress), the result of all of which is stronger blocking for the DoA on its end run. The AFBF thus becomes an additional blocker, available to help shepherd the DoA past the remaining defensive obstacles, including the two probable conference committees.

A third possibility depends on the versatility of the tight end as blocker, runner, or pass receiver. In Figures 1 and 2, the AFBF served as a blocker for the interests of the Department which, in turn, serves its interests. However, in the case of agriculture, and other policy areas, organizations such as the AFBF may be given considerable authority to determine federal economic policy toward its members and others in the same field, often with inadequate controls and supervision. Figure 3 depicts a fake hand-off to the DoA, which proceeds to run the end sweep pattern (following either Figures 1 or 2), and a pass from the President to the AFBF running down the sidelines of political legitimacy. (An alternative might have the DoA assume temporary control of program or budgetary leadership, only to pass to the AFBF or to lateral to it for an end-around run.)

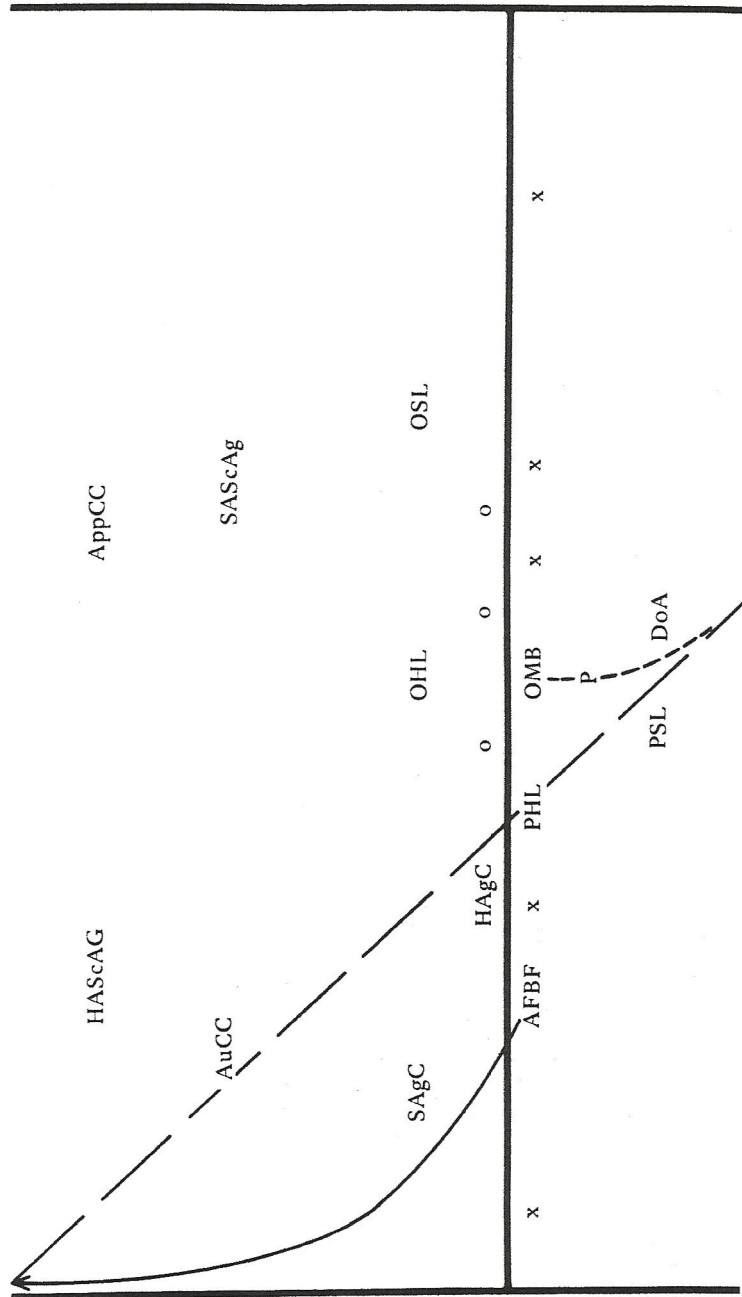
The schema offered here is flexible and open enough to incorporate other possibilities. For example, red-dogs by the opposition party leaders (OHL and OSL) or a blitz by the strong safety (HAScAg) would

FIGURE 2¹¹



¹¹ Source: Baltimore Colts vs. New York Giants (5 November 1962), Quarter 4, play 19.

FIGURE 3 ¹²



¹² Although adopted by other teams, this play was perfected by and primarily associated with the Flying Bolsheviks (University of Chicago, 1962-1966).

depict political strategies for which there are numerous historical precedents. Disagreements or inadequate communication and coordination between President and presidential party leaders in Congress might be depicted in terms of missed blocking assignments by PSL or PHL with disastrous consequences for the dollar-yard gains of the offensive team.¹³ Conflicts within the Administration, as in the case of Eisenhower and Humphrey, may be conceived as a backfield fumble, disrupting offensive team coordination for that play and perhaps destroying offensive momentum for the succeeding series of plays. (In either case, there would be little alternative but to drop back and punt.)

The particular value of this schema lies both in its familiarity and in its ability to depict the entire spectrum of political participants and strategies. Yet it may be useful to suggest some of the ways in which the political game differs somewhat from the gaming principles on which it is based. (See also the notes accompanying the descriptions of parameters and players.) For example, the schema simplifies reality by assuming that each agency's budget can be described in terms of one continuous play rather than as a series of discrete actions. And, year after year, the political game is played between only the same two teams, with relatively minor changes in personnel and institutional interests. The players therefore come to learn the strengths and weaknesses of their opponents—their policy commitments and preferred strategies. As a result, the outcomes of most plays become fairly predictable, and success is not measured in terms of the absolute number of yards gained or lost but in terms of a play's outcome relative to other plays and relative to the average for that play in previous games (given the variables of field and weather conditions, etc.). Offensive and defensive alignments become set accordingly, and successful blitzes and red-dogs are likely to be rare except during plays which involve agencies lacking strong blocking in the form of public support groups.

For many of the same reasons, the offensive team does not seek a touchdown on every play, nor does the defense always seek to prevent any gains. Instead, the political game often seems to resemble an orchestrated dance more than a contest. To the extent that interests are shared across team lines, and to the extent that plays and actions become predictable over time, the offensive team may move down the field (within endlines and sidelines) with some movements becoming as formal as elements of Japanese "No" plays. But communications are imperfect, and there are conflicts of interest within and between teams,

¹³ See the *New England Patriots, 1970–1971*, passim.

making somewhat variable the precise outcomes of relatively predictable plays.

With relatively minor adjustments of plays and players, the schema presented above may be applied to aspects of the legislative process other than budgeting and appropriations. However, its full potentialities have yet to be explored. The recent development of political science indicates that many minds must labor together to capitalize fully on flashes of individual insight. Suggestions for the further development, modification, or application of this schema are therefore solicited.