DUNCAN BLACK: HEIR TO ADAM SMITH AND THE SCOTTISH ENLIGHTENMENT

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Abstract

Duncan Black, like Adam Smith before him, was trained at, and taught at, the University of Glasgow. Like Smith, Black followed the Enlightenment in appreciating the importance of theory and of its empirical applications. Black sought to apply the ideas of a schedule of preferences and a conception of equilibrium, to politics, as Smith had done in economics. Black believed that his median voter theorem could generalize to a theory of politics, much as Smith's contributions did for market economics. Black did not complete that generalization, but William Riker did offer a theory of institutional politics, designed to complete Black's project.

Introduction

William Riker opened his essay 'Voting and the Summation of Preferences' (Riker, 1961, p. 900) by saying this about the twentieth-century economist, Duncan Black: 'The occasion for this bibliographical essay is the publication in Black (1958) of Duncan Black, *The Theory of Committees and Elections*, which is one of the most important books on political theory to be published in this century'. A bold statement made even bolder because Black and his work had, for decades, languished in obscurity, often not even being published.[1] Riker's purpose was to correct that lack of attention, and in this, he succeeded.

In some ways, I see this short essay as the sequel to Riker's essay. I here argue that Black is, in most important respects, the last member of the Scottish Enlightenment, even though by most accounts, the Scottish Enlightenment ended around the end of the eighteenth century, perhaps at the start of the French Revolution. That is, he not only followed many of the core tenants that comprised the relevant aspects of the Scottish Enlightenment, but he also had an intellectual project that would fit well into the Select Society (founded in Edinburgh in 1754) and other bases of intellectual fervour and exchange in this period. This is so because his intellectual project sought to do for democratic politics what Adam Smith did for free market economics.

If that claim is audacious, that audacity is due to Black himself, or, to use his own words:

1. This article will put forward the view that Economic and Political Science are the same in kind: that when we do eventually obtain a 'satisfactory' Political Science it will have the same

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[1] As we discussed below, Black was particularly attracted to the Rev. C.L. Dodgson (aka Lewis Carroll) who also had difficulties publishing easily, if at all, in terms of his professional writings on voting and representation, including the eventually published book on proportional representation (1884) that Black thought singularly important.

distinguishing marks as Walras' *Elements* or Pareto's *Manuel*- or perhaps Marshall's *Principles*, with the admixture of the rigorously formal and the descriptive treatment-rather than those of the existing texts in Politics. And the core of the treatment, we hold, will consist of a set of formal or mathematical propositions.

2. The main reason which I can give in substantiation of this view is that it is possible, using terms which are precisely those of Economic Science, to construct a Theory of Committee Decisions. In getting a theory of the committee, however, it is clear that we at the same time get a sufficient means to construct a Theory of Politics. (1950, 506).

Later in the essay, he wrote that:

A theory of committees seems to be obtainable; and, if so, we argue, a Theory of Politics. And the essential features of a Theory of Politics obtained along these lines will be those of a theory of committees. But, as we will proceed to show, these essential features are precisely those of Economic Science. Indeed, if we accept the view that a Politics can be developed out of the theory of committees, then Political Science and Economic Science would appear quite definitely to be two branches of the same subject. In particular, we can specify that they make use of the same language, the same mode of abstraction, the same instruments of thought and the same method of reasoning, because this is true of the theory of committees and of Economic Science (1950, 507).

Black and the Scottish Enlightenment

Perhaps the most interesting feature of the Scottish Enlightenment ('S.E.') was its remarkable range of people and their projects that are attributed to it. These range from art and architecture, through philosophy and poems, to the social and natural sciences. Others find the most interesting feature of the S.E. to be that it arose in one place at one point in time and in a small and quite poor nation. While it was centred in Edinburgh for the most part, it actually arose in Glasgow. Let me quote from the *Encyclopedia Britannica*:

There are those who specify that the Scottish Enlightenment began in 1740, although this fails to take account of the date of publication of one of the two most significant books to come out of the period: Hume's *A Treatise of Human Nature*, the product of agonized labours in France in the 1730s. Its first two volumes were published in 1739, preceding the other truly great work of the Enlightenment, Smith's *The Wealth of Nations*, by 37 years. Also very influential was the first major work of Francis Hutcheson, *An Inquiry into the Original of Our Ideas of Beauty and Virtue* (1725). Hutcheson, a professor at the University of Glasgow, was a major source of inspiration for his pupil Smith as well as for Smith's professorial successor, Thomas Reid.

I quote from this source because the *Encyclopedia Britannica* (1768) is considered to be one of the most enduring legacies of the Scottish Enlightenment. In addition, it makes clear that there is a well-defined starting point to the S.E., that there is a well-defined starting person, Francis Hutcheson, and that he (and therefore it) resided at the University of Glasgow.

The Scottish Enlightenment coincided with its continental (and especially French) manifestation. The Enlightenment generally is often dated from 1715 (at the death of Louis XIV) to 1789 (the French Revolution) or 1804 (Kant's death).[2] The Scottish and continental versions shared principles that are generally thought to compose the Age of Enlightenment (aka the Age of Reason). However, it is also important to note that the Enlightenment came to Scotland in the wake of the Union with England

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[2]It is also sometimes dated to have begun with the publication of Descartes' *Discourse* (1637) or of Newton's *Principia* (1687).

(1707). It is also often thought that it came to Scotland, in particular, because of its unusually large number of universities (five, compared with the much more populous England's two).

Central features of the Scottish (and more general) Enlightenment were pride of place given to humanism and especially to reason as the basis for developing knowledge and the centrality of the belief in the necessity of harnessing that reason to experimentation, evidence and usable knowledge. Given, however, the diversity of individuals, ideas and the range of reach of those engaged in the S.E., it is clear that the main thing was a commitment to reasoned discourse. As we will see, Black drew heavily on such principles in formulating his ideas and his theory of committees and elections.

His fascination with the Rev. C.L. Dodgson (aka Lewis Carroll) emphasizes how Black, too, was attracted to those who were mathematicians and scientists, poets and philosophers, all together. It was in Dodgson that Black found his inspiration to make his audacious claim. He probably did not think of it as audacious, however, because he believed that Lewis Carroll had accomplished much of it well before Black, himself, came on the scene. Black's paper on Carroll's work seemingly lost or at least greatly underappreciated the book on proportional representation (Dodgson, 1884) and basically asserts that point (Black, 1967). Later, Black would argue that Carroll could be understood as developing an account that is fully compatible with the theory of games (Black, 1969).[3]

In short, Black was centrally interested in reason. He believed that it should lead to nothing short of a revolution in political science, and his particular project was to ensure that reason was applied to politics. He drew widely from not only Carroll but also from Condorcet, Laplace and Borda, inter alia. That is, he was especially interested in political thinking among the intellectual elite, including those of the continental Enlightenment. He was also especially interested in creating an enlightened account of politics (if I may) that would address real problems. After the publication of *The Theory of Committees and Elections* (1958), he not only read and wrote deeply about Dodgson, but he also worked extensively on political geography, especially urban politics and development, extensively. In the 1970s, he spent time at the Department of Political Science, at Michigan State University. He was asked to write a new procedure for the selection of the department chair (who was actually the head). He did so and chose procedures featuring the Borda count to do so, even with his mixed views on them (Black, 1976). In these ways, I believe that it is reasonable to conclude that Duncan Black was an heir to the Scottish Enlightenment.

Adam Smith and Duncan Black's project

What specifically were the principles on which the revolution in political science should be founded? It appears that there were two, and these two are, not at all coincidentally, two of the most important contributions Smith made in the *Wealth of Nations* (Smith, 1776). The first of these two principles is self-interest, or the premise that people have preferences and act to realize those preferences.[4] The second is equilibrium in collective outcomes, based on an individual's acting so as to realize their personal preferences.

One of the most famous quotes taken from the *Wealth of Nations* is as follows:

> It is not from the benevolence of the *butcher, the brewer, or the baker*, that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our own necessities but of their advantages.

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[3]McLean *et al.* (1995, 2012) explore this connection, with the former being primarily interested in indicating the treasure trove of Duncan Black's papers that had yet to be fully exploited. After covering some of Black's life, their article (like the book) mostly focuses on understanding Carroll's work (and how Black came to understand and appreciate it).

[4]As with the theory of political choices, the theory of economic choices requires considerably more restrictive conditions on individual preferences. Indeed, while single peakedness is often understood as being exceedingly demanding, so too, in reality, are economic preferences that yield general equilibrium in the Smithian market.

There are longer versions of the same basic claim about acting to realize their own preferences, but this short, pithy account makes the point. Duncan Black makes the same argument:

> Reasoning throughout both sciences, therefore, seems to me to be nothing short of identical in kind, and we draw the conclusion that Economics and Politics really form two branches of the same subject. Each relates to choosing of some kind, and it might seem that a suitable title for the subject that includes both would be the Theory of Choices; but if such a title were used, too much would be brought under it: Ethics, in one aspect, is a theory of choice, and the Theory of Permutations and part of the Theory of Probability is again a theory of choice. On these grounds it would seem preferable to refer to the wider subject, which includes both Economics and Politics, as being the Theory of Economic and Political Choices (Black, 1950, p. 514).

One of Blacks' most fundamental contributions is his theory of preferences and individual choice. In particular, he developed the concept of what he referred to as 'single-peaked preferences'. Over any range of alternatives, there is one that the individual chooser likes best (called one's 'ideal point'). As alternatives move away from that ideal, those increasingly distant alternatives are of declining preference. We will return to the importance of this assumption in the scholarly community and, even more consequentially, in the political world, later on. For now, let me simply assert that this accounting of preferences is a long-standing and truly central concept in the popular and academic understanding of democratic politics much like profit/income maximization is understood to be so central to the popular and academic understanding of the free market economics that Smith's work inspired.[5] In both cases, the nature of preferences is assumed, but the particular assumption, increasingly precisely developed and specified, leads to the Theory of Economic and Politics Choices to which Black referred.

That theory of choices, or the theory of capitalist economies and democratic politics, uses those preferences to assess conditions under which there is an equilibrium in the economy/polity and to assess its features, if there is one. Two quotes from Black make the point for both. First:

> Apart from the schedule of preferences, the other main instrument in the two sciences is the conception of equilibrium. In Economics, from the time of Adam Smith onwards, the question asked has been: What are the characteristics of economic equilibrium in the particular case concerned? Even in asking the question which the science is an attempt to answer, it is pre-supposed that a concept of equilibrium has been, or can be, found. In Politics the question which should be asked, so far as I can, see, is: What are the characteristics of political equilibrium in particular cases? Or, more exactly: What characteristics of political adjustment can be formulated in terms of a theory of relative valuation and in terms of a concept of equilibrium? If this really is the problem with which the science is concerned, it becomes apparent that the whole nature of Political Science derives from the question asked. (Black, 1950, p. 512).[6]

Second:

> In both sciences the fundamental requisite is to give an account of the relations which, in conditions of equilibrium, necessarily hold between the elements; and in both the most general type of theory would be formulated in terms of Mathematics. This has its disadvantages, but it is only by

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[5]It is a coincidence of some note that this distance-related account of single-peaked preferences often is inspired by and exemplified in the left–right terms that originated in the French Republic following the Revolution. That is, Black's single-peaked preferences appear to be exemplified in an allegedly republican democracy during or at the immediate end of the Enlightenment.

[6]This is one of the few instances I have found in Black's work that he explicitly refers to Adam Smith. While it would be convenient if I were to have a nice quote from Duncan Black saying words to the effect that he is trying to do for democracy what Smith did for the free market, my claim is that his work rested on that foundation, whether he acknowledged it (perhaps even to himself) or not.

mathematical logic that we are able to deal with a number of inter-dependent variables, each influencing and being influenced by the others. To begin with, however, progress in the formation of a Science of Politics is likely to take the form of a number of studies in 'partial analysis'. This would employ only two or three variables, and would be expressible in terms of Geometry. (Black, 1950, p. 513).

In this case, therefore, it is self-evident that Black saw himself as proposing for politics what Smith and others proposed for their theory of the economy. So common is this point for the market that Black pointed not just to Smith, as above, but to Walras, Pareto and Marshall, as quoted in the introduction.

These two concepts point to the importance of 'formal or mathematical' expression of the theory. While the basic ideas are well conveyed in ordinary language, serious work in the theory of choice and in the derivation of equilibrium in politics, as in economics, all but requires formalization. As Black was working, the formalization of economics, long underway in economics, was reaching a peak. For example, von Neumann and Morganstern (Von Neumann and Morgenstern, 1944) developed a formalization of cardinal utility that serves as the formalization of the theory of political choice for the most part. They also developed the equilibrium that Black uses, e.g., in analysing Carroll's work, as noted earlier.[7] In addition to those Black pointed to for economic equilibrium analyses, we were on the cusp of full, formal proof of the general equilibrium version of Smith's free market (Arrow and DeBreu, 1954). This now begs the question of just what Black did contribute to the assessment of political equilibrium.

Duncan Black's science of politics: The 'success' and 'failure' of his project

As we saw earlier, Black believed that a theory of committees *could* and, perhaps more fully, *would* lead to a complete theory of politics. He did make great strides in not only the theory of committees but also in the theory of democracy. I point to four specific contributions.

1. *The median voter*: Black is justly famous for proving the median voter theorem. It rests on three assumptions. First, every committee member/voter has (jointly) single-peaked preferences, and they vote to realize the highest position in their preferences they can. That is the theory of choice. Second, the institutional theory of politics is that everyone can propose any alternative they want at any time (no 'agenda control' in today's parlance) and that voting is always by pairwise comparison. The basic observations are that, with pairwise voting, voters support whichever of the two options they prefer.[8] Secondly, an open agenda means that at some point the ideal point of the median voter will be proposed (below we indicate how one can calculate the median voter), if by no one else than by median voter. He/she would do so because, once it is proposed and enters voting, it defeats every other alternative, and it is, by definition, what he/she wants most. It is thus chosen, it is the 'Condorcet winner', and, more importantly for here, it is the equilibrium of this voting game. In this sense, the median voter is the solution to many behavioural problems and circumstances in committees and elections. It does not take Smith's invisible hand to get to it, but it does take single-peaked preferences, an open agenda and pairwise voting rules. In this sense, it is a specific instance of a general equilibrium.

2. *A full social ordering*: With these assumptions, Black could get more than a behavioural equilibrium. When these conditions are met, there is a complete, reflexive and transitive ordering of all possible alternatives/outcomes. That is, it yields what Arrow's General Possibility Theorem (Arrow, 1951) was seeking and found impossible. It does not violate Arrow's theorem for the same reason that Smith's equilibrium (or Arrow–Debreu's) does not. Both Black and Smith restrict preferences, albeit in different

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[7]This is not to count Samuelsson's *Foundations of Economic Analysis* (Samuelson, 1947).

[8]Farquaharson (1969) was working on similar ideas at about the same time, quite independently, and developed the idea of strategic, or, as he called it, 'sophisticated', voting. This would complicate the proof of Black's theorem but not obviate it.

ways, and this violates Arrow's condition of 'universal domain'. As a result, Arrow's General Possibility Theorem does not apply.

With full social ordering, much can be achieved. In behavioural terms, scholars of the U.S. Congress, for example, look at particular restrictions on the open-agenda assumption (maintaining the rest of Black's assumptions; see, e.g., Aldrich *et al.,* 2022). Transitivity allows there to be a solution to political choice in any subset of alternatives, such as those arising from one version of agenda control or another. Even more interestingly, as I believe (but cannot prove) Black understood, a full social ordering in a representative body, such as a parliament or congress, provides the ability to make (ethical?) claims about representation. In particular, one might say that social ordering represents the preferences of the collective, and thus, we can judge how 'representative' the body is of its members and, at a step farther removed, how representative it is of the public who elected the representatives in the first place.

3. *Generalization is possible*: Black and Newing (1951) considered how to generalize the theory of committees and the median voter theorem. The geometry of single peakedness generalizes easily to n-dimensions, whereas the original notion and theorem had, in effect, restricted attention to a single dimension. Similarly, the economic and political science versions of equilibrium also generalize easily to study in multiple dimensions (with the modest exception of their existence or lack thereof). In this little book, they played at length with the notion of equilibrium and how there might be different sorts, but the most important thing they discovered was the complexity of getting a voting equilibrium, a median voter-like result, in more than one dimension. With a great deal of formal geometry, they nonetheless restricted their attention to three voters and two dimensions. Unlike the single-dimensional case, this case turned out to give access to the full generality of Black's project. Consequently, they discovered the most important result, one that took a few decades for the mathematical social sciences to work out in full generality. Their result took three sentences:

> Thus, any point in the *a-b* [i.e., a two-dimensional plane] that is a majority decision must lie on indifference contours of the three members, without these contours having any areas in common. And this is a *necessary* condition for the existence of a majority decision.

> Further it is a *sufficient* condition for such a point being a majority decision. (Black and Newing, 1951, pp. 21–2, italics in original).

Necessity and sufficiency basically yield a complete story, and there is no more to learn. It is a very powerful result. The remarkable thing (or at least I find it remarkable) is that it appears that two dimensions and three voters are enough to cover nearly everything of interest (i.e. generalizing to n voters and m dimensions). In that sense, it lays out the fuller theory of committees—and perhaps democratic politics—completely. In more specific terms, when there is a (multidimensional) median voter, there will also be a full social ordering of alternatives, just as was found in one dimension.

4. *Generalization means equilibriums are (exceedingly) rare*: The downside is that the conditions are now more than merely restrictive in the sense of, say, self-interested preferences in the free market. They are extremely restrictive. To get equilibrium with three voters and two dimensions, Black and Newing showed how odd preferences must be (Black and Newing, 1951, Figures 15 and 16, p. 22). We know that even a 'small' number of 'other-regarding' preferences can destroy market equilibrium. As Smith wrote (Smith, 1776), 'It is not from the benevolence of the butcher, the brewer, or the baker, that we expect our dinner, but from their regard to their own interest'. Again, Smith wrote:

> The natural effort of every individual to better his own condition is so powerful that it is alone, and without any assistance, capable of not only carrying the society to wealth and prosperity, but of surmounting 100 impertinent obstructions with which the folly of human laws too often encumbers its operations.

At the peak of Black's career, Samuelson demonstrated that preferences for pure public goods—the rare extreme on one end of the continuum, with the other (and equally rare) extreme of pure private goods on the other end—still had an equilibrium, but it is a decidedly inferior (Pareto suboptimal) equilibrium (Samuelson, 1954). In between the two ideal forms of goods (or equivalently, of preferences for self and others welfare), where most of economic preference reality appears to reside, if there is an equilibrium at all, it is inferior as well. Thus, Smith's laissez-faire economic theory would fail Smith's own standards.

So, too, in politics are there problems related to equilibrium and/or its optimality in what most take as nearly every realistic political situation for the theory of committees and thus the theory of democracies. When students encounter Smith's market economy and its possibilities, they tend to find it natural to think that socially desirable equilibriums are the typical state of affairs (at least in Western [American?] universities). So, too, when students encounter the median voter result, they tend to believe that is the natural state of affairs of reasonably high quality and desirability in voting and elections, that is, in democratic politics. Black would go on, however, to move almost immediately from his necessary and sufficient conditions to show that it is difficult to satisfy those conditions with three voters and two dimensions, generalized single-peaked preferences or not, even with binary voting and open agendas—indeed perhaps especially with open agendas. It was in this sense the final and lasting contribution of Black (and Newing) to the theory of committees and elections to lay out in a simple geometry almost precisely the exact logic that developed not just Plott's conditions (Plott, 1967) but also those of McKelvey and Schofield (e.g., McKelvey and Schofield, 1986, 1987). These led Riker (1988; originally published in 1982) to complete Black's project for a theory of democratic politics in at least Riker's way, which is the modest claims of a very thin sort of democracy that is variously called 'liberal' or 'Madisonian' democracy. As everyone, Riker included, is quick to point out, it is quite thin gruel, indeed.

It appears that having more than one basis of choice in politics also can destroy a voting equilibrium. The result is no behavioural outcome like a median voter.[9] The result also means that if we cannot say what *will* be chosen, we cannot say what *should* be chosen. Thus, point 3 is that there are conditions in more general terms than the median voter theorem for the theory of committees and of democratic politics more generally.[10] Point 4 is that they rarely exist.

Legacies of Black and a science of politics

Black left a remarkable legacy with a theory of politics that looks in some ways quite like Smith's theory of economics. Both built their theories on an account of (relatively simple forms of) individual preferences, and both sought social outcomes based on equilibriums. Indeed, both saw to the end of their projects, even if it took others decades (or even centuries) to get the formal work right. The formalizations basically demonstrated that, upon careful reflection, Smith and Black were correct in their accounts.

As we saw, it is not that Black did not make what might reasonably be considered the central accomplishment for making his project successful with his median voter theorem (Black, 1958). Rather, he reached the conclusions that seem to flow fully from a theory of political preferences and (political) equilibrium, thus making in that sense a complete theory of democracy.

In that sense, also, Riker is essentially the hero of Duncan Black's story. The paper began with a quotation from Riker in 1961. Thirty years later, in reflecting on the history of the Public Choice Society, Gordon Tullock made much the same kind of claim as Riker, but in this case about public choice (and the Public Choice Society):

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[9]The full generalization is that the median voter can generalize to n-dimensions, but there is an n-dimensional median only if ideal points are unidimensional, even if embedded in n-dimensional space or if there is a very rigorous symmetry to ideal points. While there are other slightly different versions, these are called the 'Plott conditions', due to Plott's original formalization (Plott, 1967).

[10]One result of the existence of a voting equilibrium is that a majority of voters share the same ideal point, so the case is, in that sense, not closed. (Indeed, campaigns are considered instances of persuasion—trying to persuade voters to share your ideal point.)

The main purpose of this paper is to discuss Duncan Black's work role in founding public choice. Nevertheless, I'd like to start by a few personal remarks. Duncan Black was a wonderful person. Everyone who knew him liked and admired him. His very important work, and as of this paper will indicate his work was important, came from selecting an important problem which no one had previously dealt with and concentrating on it. No Nobel Prize winners can actually claim to have had effect on a discipline greater than he had on his newly invented field of study.

Turning to his actual work, he quite literally is the founder of choice. The first six articles which can be regarded as public choice were all written by him. (Tullock, 1991, p. 125).

Certainly, being the intellectual founder of a major interdisciplinary movement that has shaped public policy in America and led to at least one Noble Prize is a major test of his influence. Respect needs to be paid, and the *Public Choice*, the journal of that society, named its best paper award to honour and respect him, but the ultimate respect comes, in my view, from Riker.

Riker not only first saw the importance of Duncan Black's work, but Riker was also able to see the result of Black's specific project, even if it ended with a Rikerian version of democratic theory that is considered 'thin'. Black's legacy, that is, traced even more closely to where Lewis Carroll's work ended up. In the chapter in *Alice in Wonderland* (1960) about the 'caucus race and a long tail', we find something closer to Condorcet's cyclical majority than to Black's median voter, which is something close to Black and Newing's analyses:

'What I was going to say' said the Dodo in an offended tone, was that the best thing to get us dry would be a Caucus-race. … There was no 'one. two, three, and away!' but they began running when they liked and left off when they liked, so it was not easy to know when the race was over. However, when they had been running half-an-hour or so, and quite dry again, the Dodo suddenly cried out, 'The Race is over!' and they all crowded round it, panting, and asking 'But who has won?'

This question the Dodo could not answer without a great deal of thought,….At last the Dodo said, '*Everyone* has won and *all* must have prizes'. (Carroll, 1960, pp. 48–9).[11]

This is the legacy of what I have been calling 'Black's project', although many might see the caucus race as ending with 'No one has won and *no one* deserves a prize'. Like Smith, however, his work had numerous practical and theoretical consequences, in addition to the enormous importance of their projects. I close with two such examples.

As to the theory of preferences, it so happens that Clyde Coombs was working on a method of scaling at about the same time as Black was working on his theory of voting (Coombs, 1950, 1964). His work led to the method of unfolding and eventually to non-metric scaling such as Kruskal and Shepard (Kruskal James and Wish, 1990; Shepard, 1962). Unfolding in one dimension is based precisely on Black's single-peaked preferences for the median voter theorem, and Kruskal and Shepard et al. generalized this to scaling based on multidimensional single-peaked preferences. Single-dimensional unfolding results lead very specifically to identifying the ideal point of the median voter when the underlying scale (e.g., left–right) is unknown.

[11]In Martin Gardner's annotations, note 2 to chapter 3, p. 48, he writes, 'Carroll may have intended his caucus-race to symbolize the fact that committee members generally do a lot of running around in circles, getting nowhere, and with everyone wanting a political plum'. Assuming that is true (as indeed it most certainly seems to be), it illustrates how Black and his median voter theorem differ from Dodgson/Carroll, having seemingly solved the question of who wins a caucus race, as we discuss below.

Poole and Rosenthal's famous suite of scaling procedures, such as Nominate, rests on the assumption of single-peaked preferences. Their work has been of truly major importance in the scholarly study of the empirical world of Congress, the public and so on. In many respects, it has become the empirical version of Black's project (see Poole and Rosenthal, 1985, 2000). Their work has underlaid application of Downs' 'spatial model' (1957), which is the public elections of office holders equivalent of Black's theory of committees and thus one elaboration of Black's project.

That spatial model (started in Political Science by Downs' work [1957] and generalized and formalized by Davis *et al.* (1970)) has become the workhorse account of American democratic politics (inter alia) and has focused heavily on the question of Black's equilibrium, by assuming Black's theory of preferences. Romer and Rosenthal (1978, 1979) and Shepsle (1979), for example, dealt with the question of how institutional structures intervene in empirically important ways between preferences and equilibrium, even when it exists. Cox and McCubbins and Aldrich and Rohde have done so to understand how Congress works as it deviates away from what a pure 'institution-free' account of politics would yield, especially with respect to political parties in Congress (see Aldrich *et al.,* 2022). It resides not merely in scholarly papers but in virtually every major American newspaper. That is to say that Black's full project has structured a great deal of both theoretical and empirical works, especially but far from only about American politics in theory and in practice. In that sense, as well, his legacy of politics looks much like that of Smith's for economics.

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