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## **The Condorcet-Jefferson connection and the origins of social choice theory\***

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**Abstract.** This paper explores the relationship between Condorcet and Jefferson to gain insight into the early development of social choice theory. Jefferson does not seem to have read or understood Condorcet's theoretical work, but studying the relationship leads to the identification of intellectual intermediaries and a different perspective on the creation of social choice theory in the French Academy of Sciences.

### **1. Introduction**

In the first edition of *Social Choice and Individual Values*, Arrow (1951) published a general analysis of the paradox of voting without even citing the work of the Marquis de Condorcet. Black's (1958) rediscovery of Condorcet's writings began a period of scholarly exploration of the origins of social choice theory. Baker's (1976) translation of parts of the introduction to Condorcet's 1785 *Essai* and his (1975) analysis of the Marquis' intellectual development show that Condorcet's primary research objective was to design social choice procedures that would maximize a group's probability of making a "correct" decision. Although Condorcet discovered the "paradox of voting" as part of his work on preference aggregation problems in the design of constitutions, he did not assume that voters were simply utility maximizers. His metaphysical research program or paradigm was based on the assumption that individuals

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have the cognitive ability to judge right from wrong and that such judgments could be true or objective like theoretical statements in physical science.

Contemporary theorists (Grofman and Owen, 1985; Nurmi, 1983; Young, Urken and Traflet, 1985; Urken, 1988; and Young, 1989) have begun to pay more attention to Condorcet's cognitivist political theory. Black's interpretation of the Marquis' work has provided the basis for the dominant interest in problems of preference aggregation (e.g., Bonner, 1986; and Riker, 1982). The *Essai* is frequently quoted, but few readers get beyond the abstract style and elliptical mathematical arguments to understand the complexity of Condorcet's research.<sup>1</sup> Like Black, they are inclined to say that "correct" choices have nothing to do with politics. And, following Black, they view Condorcet's theory about correct voting decisions as a mode of analysis appropriate for legal proceedings – hence the term "jury theorem," a name proposed by Black that has become a standard reference in the social choice literature.

In fact, this theorem is only one of many ideas about correct social choices presented in the *Essai*. Condorcet does highlight the jury theorem in the 191-page preliminary discussion of the 304-page main body of mathematical and verbal theorizing, but the analysis of the social implications of the other theorems itself indicates clearly that he did not restrict his conception of social choice to juries. The jury theorem probably deserved special attention in the introduction because Condorcet viewed it as a theoretical justification for democratic participation in public affairs. As Secretary of the French Academy of Sciences, the Marquis pictured himself as a modern monarchist who supported kingship as the most effective means of mobilizing expertise to deal with social problems. From this perspective, if "the people" could function as part of the process of making competent decisions about social issues, a social scientist would find it reasonable to reform the system to allow them to participate. For this reason, Condorcet celebrates the jury theorem in the introduction to the *Essai* because it vindicated the case for creating a "polity,"<sup>2</sup> a form of government which was not purely republican or monarchist. Specifically, this theorem shows that for large groups, the group probability of making a correct decision or choice can be .99 even if the average individual competence of the voters is as low as .48.<sup>3</sup>

Despite the optimism of this theory, which stands in contrast to the negative emphasis of impossibility theorems in the social choice literature, the jury theorem did not provide an intellectual basis for bringing together republicans and monarchists to create peaceful change before 1789. Condorcet attempted to bridge the gap between these antagonists, but it is not clear if he tried to use his social choice ideas to try to bring them together. Even if reconciliation was politically infeasible, analyzing the reactions of scientists and politicians to his ideas would help us understand the origins of social choice theory. This analysis would also help determine the degree to which the Marquis was regarded

as ‘utopian,’ as he has been characterized in standard histories (e.g., Sabine, 1959) of political theory.

Although analysts such as Grofman and Feld (1988) have begun to reassess the development of social choice theory, one unexplored approach is to examine the relationship between Condorcet and Jefferson. They had much in common. Both were scientists and public leaders interested in political problems. Jefferson served as U.S. Minister to France from 1784 to 1789 and knew Condorcet. And Jefferson’s library contains copies of the Marquis’ work, including the *Essai*. For these reasons, one might suppose that comprehending the connection between Condorcet and Jefferson might lead to a better understanding of the contemporary intellectual reaction to Condorcet’s theories and clarify the modern perception of social choice ideas. For, in principle, Jefferson represented both the scientific and political audiences to whom Condorcet addressed his arguments and may be a missing link in unraveling the development of social choice theory.

This paper describes the results of exploring the Condorcet-Jefferson connection to clarify the origins of social choice theory. The results of the investigation are more negative than positive, but they lead to a reassessment of the origins of social choice theory that includes new questions about the design of social choice procedures. Section 2 reviews what is known about the development of social choice theory in France, Section 3 analyzes the direct contacts between Condorcet and Jefferson, Section 4 describes what is known about the role of intermediaries in the relationship between Condorcet and Jefferson, and the last section presents an historical and analytical perspective on the development of social choice theory.

## 2. The origins of social choice theory

Baker (1975), Black (1958), Gillispie (1972), Hahn (1955), and Rappaport (1981) show that the problem of designing social choice rules to create collective outcomes arose in the French Academy of Sciences and was generalized to society at large by Condorcet. In the French Academy of Sciences, the problem involved setting rules for the election of new members and promotion of old ones. Outside of this context, the problem was not well defined.

The problem of electing new members of the French Academy of Sciences was a political and scientific issue. Politically, the problem involved a conflict between “modernizers” or advocates of social change like Condorcet and defenders of the absolute power of the king. For although members of the Academy sought to admit the most meritorious candidates based on scientific accomplishments, political sentiments influenced voting decisions (Rappaport, 1981; and McClellan, 1986).

The resulting ambivalence of the problem of devising an election procedure was reinforced by research on the matter by leading scientists. The problem was first raised by Borda (1784), a staunch monarchist, who showed in 1782 that plurality voting yielded a collective outcome which was inconsistent with the result produced by a weighted ranking of voter preferences. And Laplace (1921) developed a voting procedure for selecting the most “meritorious” candidates. Records of the Academy’s debate on the problem have not been found, and may have been lost or destroyed (Baker, 1975). To complicate the problem of reconstructing this debate, Borda and Condorcet were bitter political enemies, so the debate on voting methods, like other controversial issues in the Academy, may have been conducted by surrogates or intermediaries.

The conventional view of the debate has been based on Black’s (1958) report that the Academy’s minutes do not mention debates about the voting issue. But Joseph Lalande’s (n.d.) edited *Règlements et Délibérations de l’Académie Royale des Sciences* indicates that members of the Academy used a variety of voting methods in making collective choices. Although an understanding of the development of these voting methods might improve our understanding of the impact of Condorcet’s theory on his contemporaries, Lalande’s work has nothing directly to say about the relationship between Condorcet and Jefferson. But since Lalande’s account shows that the problem of choosing a voting method involved more than the issue of electing new members, it suggests the existence of sources of information about voting other than the *Essai* and works by Borda and Laplace.

Regardless of how these methods were selected, they are not part of the standard description of the evolution of the Academy’s collective decision making process. According to this account, a Borda method was adopted in 1785, but was eventually reversed unilaterally in 1801 by Napoleon, who joined the Academy in 1797 (Duncan, 1975).

Before Condorcet died in 1794, he wrote two other analyses of social choice procedures. The first, written in 1792, analyzed the proposed voting system of the revolutionary regime and dealt with problems of preference aggregation, pointing out the type of paradox which Borda had first noted in the Academy in 1782. This analysis was read by Lhuillier, a mathematician from Geneva, who used it to criticize voting methods being proposed in that city. Lhuillier (1794) refers to the *Essai* as if he were familiar with it, but follows the preference aggregation orientation developed in Condorcet’s 1792 testimony. The second analysis, found in Condorcet’s opinion on the trial of Louis XVI (described in detail below), addresses the problem of designing a jury to maximize the jurors’ probability of making a correct decision. According to Alengry (1971), this opinion was not considered by the commission which was formed to evaluate the options for trying the king. The reason for this action is not clear. Condorcet’s concern with competence may have been considered

too “academic” or abstract, or the intellectual orientation of his argument and his role as a “permanent secretary” of the French Academy of Sciences may have prevented him from being considered as a credible source of advice. The latter interpretation is consistent with the fact that despite his concern with showing the world that France could organize a fair trial, Condorcet took the position that a verdict about the guilt of the king should be separated from a decision about punishment and that jurors should not rule out the possibility of pardoning Louis XVI and appointing his son as a successor to preserve political stability. For Condorcet, breaking down decisions into a series of binary choices was consistent with his earlier constitutional theory in which legislative agendas were always limited to two alternatives in order to maximize the group probability of making a correct choice (Condorcet, 1788). Nevertheless, his contemporaries may have known intuitively that the ordering of the binary choices is not necessarily neutral, a fact discovered by modern social choice theorists (Farquharson, 1969; and Brams, 1975).

If this pattern of ambivalent or ambiguous development is characteristic of the reception which Condorcet’s ideas received while he was alive, it is no surprise that there is little continuity between Condorcet’s ideas and the arguments of later social choice theorists. Poisson’s (1837) mammoth work on juries makes no reference to the jury theorem. And in his analysis of voting methods, Dodgson reinvents the Condorcet criterion, but does not include any reference to previous work, though Dodgson’s library included an uncut copy of the *Essai* (Black, 1958).

Nanson (1883) refers to Condorcet’s *Essai* as well as to the 1793 work on constitutions, but does not develop an argument based on competence. Like Condorcet, Nanson became interested in the study of voting procedures as they were used to elect new members to a scientific society. And following Condorcet, he found general application of his ideas in national politics, where he became an advocate of proportional voting (Nanson, 1900a and 1900b). Nanson’s analysis of the voting method of the Royal Society of Victoria refers to two Condorcet methods: a “theoretical method” and a “practical method.” The first method is the binary comparison technique for finding what is now known as the “Condorcet winner,” described in the *Essai*; the second technique is the 1793 procedure presented to the convention and critiqued in 1794 by Lhuillier, whose work is discussed by Nanson. In this discussion, Nanson shows familiarity with Laplace’s ideas about voting, but not with his conception of a “meritorious” or “correct” choice. Throughout this analysis, Nanson describes the results of scrutinies as being “correct,” but his conception of correctness is not Condorcet’s general philosophical cognitivism, but simply the view that an outcome is “correct” if it satisfies certain preference aggregation requirements. Perhaps Nanson was prevented from discovering Condorcet’s notion because he relied on Todhunter’s scathing criticism of

Condorcet's mathematics and delved no further into the *Essai* than part of the introduction, which would have enabled him to learn about Condorcet scoring. This conjecture is consistent with Nanson's frequent citation of Todhunter's views on other aspects of social choice theory.

More recently, Arrow, in his classic *Social Choice and Individual Values*, did not even refer to Condorcet until the second edition, published in 1963, and then did not mention the jury theorem, which Black analyzed in 1958. Yet papers by Grofman (1976), and studies by Baker (1975), Granger (1956), Michaud (1985a, 1985b), Crépel (1988a, 1988b), and Young (1989) have revived interest in Condorcet's ideas.

This survey of the development of social choice theory provides a background for asking and evaluating questions about direct and indirect contacts between Condorcet and Jefferson.

### 3. Direct contact between Jefferson and Condorcet

#### 3.1. *Explicit references*

Students of Jefferson have long been intrigued by his relationship with Condorcet. Since Jefferson and Condorcet knew each other while Jefferson was Ambassador to France from 6 August 1784 to 18 September 1789, and had similar intellectual interests, one might expect to find explicit and implicit references to Condorcet's theories in Jefferson's library and papers. For Jefferson was an inveterate reader and commentator. But published and unpublished collections of Jefferson's papers do not include correspondence that discusses the *Essai* or social choice ideas (Sowerby, 1952–59; and Sanford, 1977). Although Jefferson's papers refer to a number of Condorcet's ideas, these references involve later works. Before he left France, Jefferson sent books to America to help in the design of a constitution, but we do not know if this shipment included works by Condorcet (Johnston, 1960; and Hazen, 1897). Jefferson's library included copies of *Lettres d'un Citoyen des Etats Unis* (1788) and *Sentiments d'un républicain sur les assemblées provinciales et les états généraux* (1788) as well as *Reflexions sur l'esclavage des nègres* (1788), and *Esquisse d'un tableau historique des progrès de l'esprit humain* (published posthumously in 1795). In fact, Jefferson prepared notes for translations of the latter two works (Peterson, 1970: 262–263). He also had a copy of *Observations on Government*, by John Stevens, published with notes and commentary by Condorcet and Dupont, which criticized a multicameral legislative system.<sup>4</sup> In a letter to Madison in January, 1789, Jefferson said that he was sending him a copy of the *Essai sur la Constitution et les fonctions des assemblées provinciales* (1788), though the Madison collection does not include it (Spurlin, 1984:

123). In his correspondence with Adams (N.A., 1917) and Franklin,<sup>5</sup> Jefferson discussed Condorcet's idea that each generation is free to redefine the social contract. He also corresponded with the Marquis about weights and measures.<sup>6</sup> But none of these sources include direct evidence of Condorcet's influence on Jefferson's thinking about the design of social choice procedures.

### 3.2. *Marginalia*

One technique practiced by Jeffersonian scholars is to search Jefferson's library for marginalia. In the case of Condorcet, this approach was not fruitful. Although standard historical references indicate that Jefferson's library contains a copy of the *Essai*, records in the Library of Congress do not confirm the Jefferson Collection copy of the *Essai* as part of the original collection. Two fires have destroyed parts of the library that Jefferson donated to the United States. Furthermore, the Library of Congress contains more than one copy of the *Essai* and these copies may have circulated between the special and general collections. And, in any case, none of these copies include marginalia. Other Jefferson collections at universities and libraries do not include copies of the *Essai* or letters about the jury theorem.<sup>7</sup>

The Jefferson Collection of the Library of Congress does contain copies of other Condorcet works, including his opinion on the trial of Louis XVI, but these works do not include any marginalia.

### 3.3. *Philosophical influence*

Another approach to finding Condorcet's influence in Jefferson's thought is to suppose that Jefferson had read the *Essai* (or other works) and ask what effects one would expect to find in the way Jefferson analyzed a political problem. Obviously, Condorcet's idea about redefining social contracts may have provided an intellectual justification for America's independence at a time when the republic was still struggling to vindicate its existence. But there is no evidence of Condorcet's influence in the way Jefferson handled problems that required him to develop a mathematical formula or solution to a political problem.

However, there are several examples of problems in which Jefferson's analytic approach suggests that he did *not* follow the method of analysis outlined in the *Essai* or other works. For example, Condorcet seems to have been a more radical democrat than Jefferson. Although both believed in the perfectability of man, Condorcet had more faith in education than Jefferson. While the former viewed slavery as a traditional institution which could be reversed by



rational reform, the latter put more emphasis on the limitations of social change posed by human nature (Spurlin, 1984: 127).

Similarly, in a discussion of proportional representation and malapportionment in Virginia politics, Jefferson focused on the principle of one person, one vote as an ideal which should be upheld. There was no Condorcet-like explanation of this position in terms of the consequences for collective choice and no analysis of the voting process.<sup>8</sup> Again, in Virginia politics, Jefferson was involved in a decision about the best strategy for campaigning and allowed his subordinates to make the decision for him based on their intuition (Malone, 1962; and Matthews, 1984).

These examples of voting problems suggest that Jefferson did not have the theoretical, deductive bent found in Condorcet's analysis of politics. It is true that Jefferson used mathematical analysis in his work as an architect and was interested in a universal standard of weights and measures, but here his level of analysis involved the application of simple arithmetic calculations (Smith, 1934). Jefferson's interest in mathematics was that of an inventor, a tinkerer, not a theoretician interested in deriving predictions from the application of the binomial theorem that Condorcet learned from Bernoulli (Johnston, 1960: 69–71; and Rice, 1976).

### 3.4. *Jefferson and Condorcet as scientists*

Nevertheless, Jefferson was a naturalist and served as President of the American Philosophical Society on the strength of his role as a patron and his *Notes on Virginia*. His naturalist philosophy led him to despise metaphysical speculation, for he took certain things to be unknowable by man. For Jefferson, only God mastered the utility calculus for handling moral problems, which humans solved implicitly by doing good acts. Still, if Jefferson believed that men could not understand why certain acts were good or bad, they could know that some actions were good or bad by observing and imitating the goodness manifest in creation (Boorstin, 1981).

In contrast, Condorcet had rejected the religious metaphysics of his childhood for the metaphysics of social science in which hypotheses could be tested against experience. But like Jefferson, Condorcet did not rely on the notion that goodness was manifest or obvious. His position was that even if men could not comprehend the ultimate reasons for morally good or bad acts and define moral standards, they could go beyond an appeal to nature by learning how to make better decisions based on an understanding of the logical relationship between social choice processes and collective outcomes.

In short, for different reasons, Jefferson and Condorcet shared confidence in the "natural" ability of man to make moral judgments, but they differed in their conceptions of the limits of human judgment.

As a natural scientist, Jefferson's interest in analyzing processes was piqued by the theories of Buffon about constitutional and animal development. Jefferson ridiculed Buffon's simple arithmetic model of the effect of population growth on constitutions by developing an absurd mathematical result (Hazen, 1897: 42) And in his *Notes on Virginia*, Jefferson developed counterexamples to Buffon's theory that all animals in the new world are smaller, that there are fewer species, and that human life in general tended to grow weak and feeble (Boorstin, 1981: 86). Similarly, in 1815, Jefferson discussed an argument about miscegenation by using a model based on added fractions (Brodie, 1974: 334–335).

### 3.5. *The trial of Louis XVI*

Jefferson and Condorcet were both interested in the trial of Louis XVI in 1792. Condorcet wrote an opinion on the trial in which he supported trying the king to show that no one was above the law (Condorcet, 1792). However, he emphasized that the trial must be based on sound social choice procedures to insure that the jury would have a high probability of making a correct decision. The constitution included no rule for judging the king and Condorcet argued that it was important to develop a rational basis for prosecuting Louis XVI in order to preempt an intellectual justification for an international monarchist counterrevolution should the king be found guilty of violating his contractual relationship with the sovereign people.

Condorcet's rational basis for a trial is derived from the jury theorem. He proposes that jurors be selected by judges named by local legislatures and that the law be followed which allows the accused to reject a certain number of jurors. This part of the process would produce jurors familiar with the law and avoid the impression that the jury was not representative of the spectrum of public opinion. According to Condorcet, although the law which requires that a valid jury verdict be carried by a margin of at least eight votes (out of twelve jurors), a smaller margin can yield the same group probability of making a correct choice as the number of jurors is increased. He observes that increasing the size of a jury and setting a verdict requirement to the four-sixths margin of the twelve-person jury will not guarantee the truth of a judgment, but it will force the jurors to choose among two extreme choices.

Condorcet believed that the trial should have been conducted in a secluded location to guarantee that the jury would be autonomous. The verdict should have been final and should not have been subject to reversal, even by the people. But the jury should have separated the question of guilt from the question of punishing the king should he be found guilty. Condorcet suggested that the death penalty was unjust for a person who posed no threat to society and

that murders ordered by the state were more dangerous than other alternatives. Although he did not describe these alternatives, he suggested that an heir might be a necessary evil for maintaining order and that the jurors should act “prudently” and not rule out pardoning the king as an option.<sup>9</sup> Although Condorcet’s opinion was circulated, it was not presented to the High Court of Justice as part of its deliberations about the trial.

Jefferson’s papers include no direct comment on Condorcet’s argument, but correspondence indicates that Jefferson did follow the trial (Hazen, 1897: 51–52). He recognized that the king was limited by law, but took exception to the idea of punishing the king by death. In fact, after the trial, Jefferson said that he would not have voted with the faction favoring the death penalty.<sup>10</sup>

### 3.6. *Summarizing the relationship*

Despite the intellectual and personal contacts between Jefferson and Condorcet, the former seems not to have assimilated the latter’s theoretical approach to the design of constitutions. Jefferson’s interest in Condorcet’s work spanned the period from 1785 to 1794, but Jeffersonian records show an explicit interest in the Marquis’ later *Esquisse*, in which Jefferson found intellectual support for the view that each generation could redefine the social contract.

In Jefferson, Condorcet found an affinity for a naturalistic approach to politics and a representative of a society which he viewed as a “model for revolution and living proof of progress in the affairs of state” (Spurlin, 1984: 129). The intellectual level of their discussions did not have to include theoretical analyses of constitutions to cement their relationship. In fact, Jefferson’s lack of interest in the theory of social choice was consistent with the views of contemporaries such as William Short, who found the Marquis’ social analysis “too theoretical” (Spurlin, 1984) and John Adams, who regarded Condorcet as a “mathematical charlatan” (Haraszti, 1952). And for Jefferson, Condorcet, a leader of the prestigious French Academy of Sciences, served as an intellectual counterweight to the arguments of Buffon denigrating culture in America.

Perhaps the similarity between Condorcet and Jefferson is best illustrated by their positions on the trial of Louis XVI. Although it is possible that earlier correspondence led to their agreement that the king was not above the law, but should not be killed, this position shows their common emphasis on prudence, naturalism, and rationality. As Condorcet put it in a letter to Jefferson on 21 December 1792, the republics of the United States and France share an interest in destroying all “anti-natural” constitutions (Malone, 1962: 96).

#### 4. Indirect contacts between Condorcet and Jefferson

Since the relationship between Condorcet and Jefferson was based on political affinity and scientific interests, there are two avenues for tracing indirect contacts between them. One is to track scientific contacts and the other is to search for political connections. The possibilities for scientific contacts are extensive and complex, for the French Academy of Sciences included many international members (McClellan, 1986). For example, Frederick the Great read Condorcet's *Essai* and corresponded with him about it (Baker, 1975: 228–240). But there has been no systematic search of the archives outside of Paris in Europe or America for letters or documents.<sup>11</sup> We do know, however, that Condorcet helped Franklin gain election to the Academy, yet there is no evidence that Franklin was privy to the Academy's internal debate about social choice procedures. The possibilities for political contacts include the same set of actors and are equally rich. This paper focuses on the political contacts associated with the Condorcet-Jefferson connection.

##### 4.1. Gem

Richard Gem was an indirect contact for Jefferson and Condorcet. An obscure historical figure, Gem was described by Boyd in his commentary on the Jefferson papers (Boyd, 1982) and mentioned by Lynd (1982) in his study of the origins of the American revolution. Gem might have been interested in social choice theory for two reasons. First, he introduced Condorcet and Jefferson in 1785 and served as an observer of French affairs after 1789 when Jefferson returned to the United States (Brodie, 1974: 433–434). And second, Gem had a nephew, William Huskisson, whom he educated in Paris and who, like Condorcet, frequented the political Club of 1789.

Gem began serving as a physician on the staff of the British Embassy in Paris in 1762 and was a strong supporter of French republicanism. As a physician, he distinguished himself by developing his own theories about diagnoses rather than relying on traditional wisdom. He was a member of the Jacobin Club (Alger, 1889; and Stephen and Lee, 1967–68) and might have known Condorcet from the political forums or publications in which the Marquis may have presented his social choice perspective on constitutions. Consequently, Gem's papers might include copies of letters, documents, or manuscripts which verify that Condorcet presented his theories in political circles and clarify the reaction of this political audience to his ideas. Unfortunately, when Gem died, a large portion of his papers were given to his nephew, William, and have not been found. Nevertheless, we know that Gem took an active role in political theorizing. He not only translated one of Condorcet's works on the rights of man and

sent it to Jefferson, but drafted his own declaration. Gem's translation was the source of Jefferson's knowledge of the Marquis' argument about the right of each generation to redefine the social contract.<sup>12</sup> Gem's declaration, evidently prepared in manuscript form only, has not been found (Stephen and Lee, 1967–68).

The connection between Condorcet, Jefferson, and Gem was established when Gem served as Jefferson's physician and apparently discovered a common interest in political theory. Although we know that Condorcet gave Jefferson a copy of the *Essai*, we do not know if the exchange took place in 1785, when Gem introduced them to each other, or at a later date. In any case, little is known about the interaction among Condorcet, Jefferson, and Gem between 1785 and 1789. But in a letter to Gem of 4 April 1790, Jefferson reiterated his warm regard for Gem and articulated their common interest in establishing "order and equal government" in France and extending these conditions to create "a rational hope that man is at length destined to be happy and free."<sup>13</sup> Gem died in 1800.

#### 4.2. *Gem and Huskisson*

William Huskisson went to Paris in 1783 to study under his uncle in preparation for a medical career, but became interested in politics and later served as a prominent politician under Pitt. William's brother also studied under Gem, but went home after a short stay in Paris. William may have worked at the Boyd and Ker Bank and "studied political economy" (Stephen and Lee, 1967–68; and Alger, 1889). Before the Revolution, William knew Dupont, Franklin, and Jefferson and participated in political clubs. This participation caused a furor later in England during the early part of his political career when critics accused him of concealing a radical republican past.

However Huskisson defended himself by maintaining that he had only given a talk about the problems of unlimited paper currency at the Club of 1789 on 29 August 1790, and had never harbored republican sympathies. In fact, William's notes of the proceedings of the Jacobin and other clubs were liked so much by the staff of the British Embassy that he joined them and eventually left Paris with the rest of the Embassy on the fall of the monarchy (Alger, 1889).

A difference between Gem and his nephew was not only that the latter did not espouse the republican cause, but that Huskisson actively opposed it. William was involved in gathering intelligence from French refugees and contacts in France and was associated with a British proposal to support counterrevolutionary forces.

### 4.3. Huskisson's political principles

The only known philosophical statement describing Huskisson's attitude about the republican cause is found in a letter to his father of 18 February 1791, supporting Burke's criticism of the revolution. William says that [I]gnorance is the great source of vice and misery and knowledge and virtue are the surest roads to happiness for individuals and nations . . .<sup>14</sup> This quotation suggests a more traditional, elitist interpretation of the pursuit of happiness than is found in conceptions of Jefferson, Condorcet, and Gem.<sup>15</sup>

Huskisson's royalist sympathies are illustrated by his comments on the trial of Louis XVI. Writing to his father on 29 June 1792, William compared the suffering of Louis XVI to the persecution of Jesus Christ. And in a letter to his father of 14 October 1792, Huskisson expressed outrage at the prospect of having the king tried by the people. He defined his viewpoint by suggesting that it was as unthinkable for the French to dethrone their king as it would be for Englishmen to remove their monarch. William said that he was ashamed of the French aristocracy, though apparently his father did not share this feeling.<sup>16</sup>

Although there are no explicit references to Condorcet in the British Museum's Huskisson Collection, it may be that Huskisson's shame was a reaction to Condorcet's argument about the trial of the king and may indicate that William regarded the Marquis as an archetypical traitor. Gem's view of the trial is not known and there is no evidence that Huskisson's antipathy toward Condorcet led him to sever his relationship with his uncle. For in a 1 September 1792 letter to his father, William reports that he is departing Paris and leaving his uncle in the care of friends. But there is evidence that Gem denounced his nephew and disowned him when he heard that William had been seen leaving a secret rendez-vous with royalist sympathizers (Alger, 1889).

Despite his royalist outlook, Huskisson may be a source of unrecovered correspondence or documents relating to Jefferson, Gem's political and scientific interests in Condorcet's work, and the political and scientific connections with Condorcet's *Essai*.

### 4.4. Gem and Huskisson as sources

Although the relationship between Gem and Huskisson and the development of social choice theory during the Revolution remains relatively obscure, it seems clear that Gem would have had an interest in the scientific and political aspects of Condorcet's theory. While Huskisson displayed no scientific inquisitiveness during his youth or maturity, Gem had an inquisitive, challenging mind and a theoretical approach to medicine. Moreover, even if Huskisson had

been exposed to Condorcet's "social science," he may have dismissed it as completely unthinkable.

The prospects for historical finds in the Gem or Huskisson papers are limited by the problem of identifying public depositories in France and private, family holdings in England. But if these sources are located, Gem's legacy is likely to be more interesting than Huskisson's papers unless the latter include parts of his uncle's collection, notes on political discussions, or the political arguments themselves.

#### 4.5. *Nicholas Collin*

Searching the Library of the American Philosophical Society disclosed no new information about Jefferson (who served as president of the Society) or Condorcet (who was a member), but it did lead to the discovery of the work of Nicholas Collin (1885). Collin, an APS member, studied Condorcet's *Essai* and gave an oral report on Condorcet's ideas to the President of the APS in 1820. However, a search of the Society's records did not disclose any discussion of Condorcet's ideas in the selection of new voting mechanisms. Still, the Society's collection did include a copy of Collin's thesis (Collin and Prosperin, 1767), which deals with "cognitive probabilities," a subject closely related to the subject matter of the *Essai*.

#### 4.6. *Philipp Mazzei*

Condorcet and Jefferson both knew Mazzei, whose scientific accomplishments in medicine and agriculture did not prevent him taking an active role in French and American politics (Marchione, 1975). In France, he was a founder of the Club of 1789 and its secretary of foreign correspondence (Marchione, 1983). Mazzei co-authored a bi-lingual *Declaration on Rights*<sup>17</sup> (Condorcet and Mazzei, 1789) with Condorcet and carried on a prolific correspondence with King Stanislaus of Poland about the course of the revolution. In America, he founded a political discussion group in Virginia that included several future presidents of the United States. This group served as a forum for Mazzei's ideas about American independence that may have found their way into Jefferson's draft of the Declaration of Independence. Jefferson and Mazzei corresponded frequently (Marchione, 1983). But there is no evidence that Mazzei's thinking about politics was influenced directly or indirectly by Condorcet's social choice theory.<sup>18</sup>

## 5. Historical and analytical perspective

Negative findings can be important because they force us to reassess our conception and definition of a problem. This review of the connection(s) between Condorcet and Jefferson develops a complex portrait of their relationship, one that defies straightforward interpretation as a “link” in the history of social choice theory.

### 5.1. *Ambivalence in the academy*

One aspect of this complexity is the scientific study of voting procedures in the French Academy of Sciences, itself. Although Lalande’s revelations suggest that Black’s review of the Academy’s minutes is not sufficient, the disclosure only makes the mystery of what happened more intriguing. For example, our ignorance might lead us to suppose that the Academy’s debate was based on mathematical analysis of voting procedures and that “political conflict” (involving choices about mutually exclusive objectives) was kept to a minimum. But this interpretation does not fit for two reasons. First, Lalande’s notes describe a variety of voting methods for different purposes. This differentiation may reflect the results of scientific experimentation, but it can also be seen as a practice that allowed factions within the Academy to manipulate the design of social choice procedures to facilitate the control of outcomes.

Second, in 1785, when the Academy adopted a reform that gave more recognition to different categories of membership, it also adopted a Borda voting procedure, which assigns weights to alternatives according to their place in voter preference orderings. This adoption may have been based on the scientific impetus of Borda’s earlier paper, but it could have also served other purposes. From 1716 to 1785, the ranks and rules governing membership did not change and though “merit” may have been poorly judged, it was always a consideration in electoral choices, even though everyone knew that elections were “engineered” and that the outcomes were often overturned by ministerial appointments (Rappaport, 1981).<sup>19</sup> Lavoisier, who led the 1785 organizational reform, was concerned with adopting changes that would democratize the Academy and enable it to resist royal political pressures.<sup>20</sup> Since this reform subsumed the adjunct membership into the associate class, Borda voting may have been perceived as a disinterested method of selecting the “correct choice” consistent with democratization of the Academy (McClellan, 1986). Yet if voting was secret, associates may have welcomed the opportunity to collude by giving lower rankings to former adjuncts to protect their own chances for advancement. At the same time, the Borda method may have cut infighting and made it easier to preserve (or reassert) the professional autonomy of the



Academy against the crown. Interpreting the reform this way, Borda's argument may have or may not have had an impact on the selection. In either case, the choice of a system was not treated as a purely scientific problem in which there is a consensus on objectives (search for the truth). For these reasons, the issue was probably ambivalent because the selection of a voting method was perceived as a scientific *and* political problem (involving disagreement about fundamental objectives).

This ambivalence in the criteria for choosing a voting method may also have been important in 1801, when Napoleon changed the method back to "plurality voting." He apparently criticized the election system in 1800 when he became president of the Institute.<sup>21</sup> Napoleon's unilateral change have been motivated by the political goal of developing cohesive, clear-cut coalitions in the Academy that would favor his blueprint for modernization. For the categorical choices required by plurality voting make it difficult to hedge in expressing commitments. Still, Napoleon's years in the Academy may have led him to discover a theoretical basis (including Condorcet's "jury theorem") for making the change. Whatever the motivation, the character of the ambivalence may have been different for Napoleon than it was for Lavoisier. For in the latter case, the viewpoints were probably not antagonistic; in the former case, however, the scientific and political viewpoints may have clashed, making it necessary to impose a method on the institution.

### 5.2. *Condorcet's role*

These conjectures lead us to reconsider the role of Condorcet himself in the Academy's voting debate. Certainly, an evenhanded observer in the Academy could have faulted him for failing to create a balanced analysis like the one originally developed by Borda in which the outcomes produced by two methods are compared.<sup>22</sup> For even a scientist sympathetic to Condorcet's ideology might ask if the group probability of making a correct choice might be greater under the same initial social choice conditions if Borda voting had been used. It is tempting to say that Condorcet could not have responded because he did not have data or access to analytical tools (e.g. simulation) to compare procedures in a general way. But he could have developed examples that illustrated the effects of plurality and Borda voting on collective outcomes. Yet his colleagues did not follow this analytical route. Laplace, for instance, was interested in presenting his mathematical results and did not compare his methods with those of fellow scientists.

Still, we know that Condorcet was a political animal and was aware of the stratagems for manipulating collective choice processes. His experience included the tortuous maneuvering of Academy politics as well as the revolution-

ary restructuring of France (Rappaport, 1981; and Baker, 1975). And it is not unthinkable that his advocacy of plurality voting in the Academy was motivated by the same reasons that led Napoleon to end the use of Borda voting: political advantage.

Given this ambivalent, heretical conception of Condorcet's theoretical interests in voting processes, it seems unreasonable to have expected Jefferson, politician and scientist, to sort out the science from the politics and to think like a mathematical social scientist. For if the experience of the Academy's voting debate suggests that scientific considerations carried little weight in the choice of a voting method, how important could social science be in the social climate of pre-revolutionary and post-revolutionary France and America?

### 5.3. *Condorcet's ambivalence and ambiguity*

While Jefferson knew Condorcet, the Marquis changed his ideas about voting and constitutions without developing an "exemplar" for any problem of social choice. In the *Essai*, he discussed the problems of applying his models of competence in social choice, but the applications seem to have been forgotten inside and outside of the Academy. In the latter case, Condorcet was forced to deal with rapidly changing social conditions by creating new models of constitutions and voting procedures that political audiences would appreciate. Yet his opinion on the trial Louis XVI shows that he had not abandoned his interest in competence as a criterion for evaluating social choices.

A weakness of Condorcet's paradigm or research program was that friends and foes, alike, could find what they wanted and disregard his primary objective of designing procedures to maximize the probability of making a correct decision. Jefferson found a natural ally in the search for "naturalism," republicanism, and progress and was more interested in the fact that he and Condorcet agreed than why they agreed or how social choice procedures could affect the attainability of their shared objectives. Huskisson's reaction to Condorcet's social choice goals was probably so negative that he would not have paid attention to the rest of the social choice argument, even if he could have followed the theory expressed in words. And Gem, though he combined a theoretical scientific orientation and political sophistication with a commitment to republicanism, may have regarded Condorcet's model of popular participation in the jury theorem as a justification for pure, radical republicanism rather than the basis for a mixed system or polity which seems to have been what Condorcet had in mind.

While shifting ground in dealing with scientific and political audiences, the Marquis could not articulate the dualistic conception of human nature implicit in his theories. In the *Essai*, for example, he does not relate the conception of

the individual as a communicator of preference information to his view of individual as a decision maker engaged in making correct choices. For instance, in the jury theorem, individuals cast votes for binary choices, each of which is postulated to have an equally-likely chance of being correct. This model focuses on the role of average individual competence (along with the number of voters) as an independent variable that determines the group probability of making a correct choice. In contrast, the paradox of voting focuses on the relationship between individual preferences and the group preference. In this problem, the conflict results from the fact that individuals have well-ordered or transitive preferences, but that the group finds impossible to reach a consensus.

Although there is no necessary conflict between these conceptions of the individual in the world of science, in the world of politics, Condorcet's dualism probably exacerbated conflicts and set him apart from less theoretical social analysts. (No wonder his opinion on the trial of Louis XVI was never officially considered!) Condorcet treated these problems as if they had objective solutions while others focused on the political implications of the problems of designing social choice procedures.<sup>23</sup> For example, in the "jury theorem," preferences are assumed to be a random variable and competencies are described as measurable voter traits in order to derive a prediction about the group probability of making a correct choice in the long-run.<sup>24</sup> In the short-run, however, the model provides no prediction. And the paradox of voting predicts a short-run problem that can create long-term uncertainty and instability.

Neither of these results provides an operational basis for social engineering. In fact, the whole analytical framework raises more questions than it answers. What happens if preferences and competencies are no longer independent variables? Does voter competence reduce to voter preference or vice versa? Or are these variables interdependent so that there is a set of conditions that regulate the relationship between competence and preferences?<sup>25</sup>

The recent work of Michaud (1985a, 1985b) and Young (1989) on Condorcet's rule shows that Condorcet did address the relationship between preferences and competence in social choice in the 1785 *Essai*. But the Marquis' analysis did not penetrate the thinking of his scientific or political audiences. If these audiences had been reached, Condorcet would have prevented the transformation of what could have been a positive force – ambivalence – into a neutralizing force – ambiguity – for the development of his paradigm or research program. For example, in his work on the design of constitutions for a republican France, Condorcet combined his work on preference aggregation with his concerns about competence without making his motives explicit. In the *Essai sur les assemblées provinciales*, for instance, Condorcet not only focused on the number of voters in a legislative body, but also set up a complicated plan

for agenda control. According to this plan, no legislature would determine its own agenda and agendas would always be composed of binary choices (Baker, 1975). Although it seems clear that Condorcet's concern with the number of voters and the binary agenda – parameters of the jury theorem – represent a continuation of the 1785 *Essai*'s theme of designing social choice procedures to maximize the group probability of making a correct decision, his work does not discuss these points. Perhaps Condorcet felt that he had to conceal the dualism of his constitutional design because he had not worked out a theoretical and empirical scientific justification for his arguments. Or maybe he felt that it was simply unrealistic to divulge the complexity of his ideas because they would be politically explosive. Regardless of Condorcet's motives, a practical consequence of his scientific *modus operandi* was that he did not have an opportunity to subject his ideas to trial and error and make them grow.<sup>26</sup>

If Condorcet had been able to develop his “social science” before the challenges of revolutionary politics emerged, he might have been in a position to respond to these questions about the relationship between voter preferences and competencies in social choice processes. Unfortunately, Condorcet never found an hospitable social environment for his questions, which, in public, would have been politically objectionable to royalists and republicans alike – inside and outside of the Academy.

The Marquis' work is sometimes criticized as unsystematic and inconsistent (Baker, 1984) because the scientific aspects of his science of social action lagged behind the social art of applying his principles. At the level of intuition and in the realm of political ideologies based on commitments to methods for finding the truth, the issues become political and the critics are correct. But as a paradigm or metaphysical research program, the matter of consistency is undecided, not undecidable.

#### 5.4. *Evaluating the connection*

The negative findings in this investigation have been counterbalanced by unexpected documents and ideas derived from pursuing the direct and indirect relationship between Condorcet and Jefferson. But what have we learned about the connection between these two scientific intellectuals? Jefferson apparently never read or assimilated any of Condorcet's social choice theories and probably would not have understood them if he had the fortitude to study them. Condorcet was not successful in communicating his theories, but the reasons for this difficulty may involve more than the Marquis' elliptical style of exposition and the political turmoil of France. In particular, the problem of choosing a voting system was never well-defined, even among scientists in the Academy, where there was benign ambivalence about the nature of the problem before

the Revolution.<sup>27</sup> In this culture, “meritorious” or “correct” choices had tacit acceptance as a theoretical and operational objective. But outside this context, for contacts like Jefferson, “competence” was interpreted according to ideological or personal metaphysical presuppositions.

For this reason, Black’s interpretation of the irrelevance of the “jury theorem” may not be “wrong” if it is taken as an expression of philosophical orientation rather than as a theoretical statement about political analysis. Condorcet was utopian in the sense that any engineer endeavors to build something that doesn’t exist, but he was not a dreamer who preferred to imagine solutions to problems rather than become engaged in the search for “rational” policies.

## Notes

1. For example, Todhunter (1865) confessed that he gave up trying to understand the *Essai* after page 62.
2. The classical Greek definition of a polity is a mixed constitutional structure that includes elements of monarchy, aristocracy, and democracy. Although there is no evidence that he was aware of this idea or Aristotle’s theory that polities are more stable than pure constitutional systems, Condorcet’s justification of popular participation is consistent with this classical perspective.
3. It is important to note that Condorcet’s arguments are not “theorems” in the modern sense of the term. For this reason, many modern readers of the *Essai* have abandoned the work because it does not include logical sequences of statements that are explicitly and rigorously derived. In fact, Condorcet refers to his mathematical arguments as “hypotheses,” propositions tentatively assumed to draw out certain consequences.
4. Like Turgot, Condorcet disagreed with John Adams’ defense of the system of checks and balances, so it is not surprising that when Jefferson’s *Notes on Virginia* were translated into French by Morellet, an associate of Turgot, in 1787, he omitted the draft of a Virginia constitution based on an unequal bicameral legislature. See Peterson (1970).
5. In *The Papers of Benjamin Franklin*, the only letters between Franklin and Condorcet deal with four questions about America addressed in a letter of 2 December 1773, by Condorcet, and answered by Franklin on 20 March 1774, and a later letter from Franklin thanking Condorcet for his help in gaining election to the Academy of Sciences. I would like to thank Claude-Anne Lopez, the collection’s editor, for her help in obtaining copies of these letters.
6. Jefferson to Condorcet, 3 November 1790, Princeton University Library.
7. These sources include the collections of the Huntington Museum, Princeton, Library, Massachusetts Historical Society, and American Philosophical Society.
8. In 1792, Jefferson proposed a divisor method for apportioning the U.S. House of Representatives, but his proposal was not based on an analysis of the voting process. See Balinski and Young (1982).
9. Allengry (1889: 176–178) reports that Condorcet’s opinion was circulated, but not cited by the High Court of Justice. Allengry does not notice that the argument about the design of a jury is the first time since 1785 that Condorcet explicitly talks about competence in social choice.
10. Hazen (1897:51–52). Apparently, in the Convention, Condorcet abstained on the motion to execute the king.
11. Granger (1956: 174) says that he scrutinized the published reports of the scientific academies in Paris, Turin, Petersburg, and Berlin.

12. In a personal communication, Iain McLean notes that Jefferson's "The earth belongs to the living" has the "authentic mark of Condorcet in the derivation of the 19-year span for contracts from mortality tables." He also contests Condorcet's *a priori* reasoning with Jefferson's bold empirical application of the idea.
13. Jefferson to Gem (4 April 1790).
14. The Huskisson Papers, The British Museum.
15. Hazen (1897: 153) points out that Burke and Adams shared the view that the laws of God made the equality of men an unreasonable goal.
16. The Huskisson Papers, The British Museum.
17. According to the title page, Mazzei drafted the original in English and Condorcet translated it into French.
18. In Marchione (1983: 337), Mazzei says that he and Condorcet debated the merits of compulsory education by the state. Mazzei apparently argued that if even the nation unanimously voted for this plan, no parents should be deprived of the right to educate their children. (There is no internal inconsistency in this argument because a limited franchise is implicitly assumed.) Although the description of this exchange provides no further information, Condorcet may have been trying to articulate his rationalist argument that if the group has a higher probability of making a correct decision than the individual, it is rational for an individual to accept the authority of the collective decision.
19. Ten years before this reform, the Academy's president had claimed the right to choose public lecturers without consultation. In 1785, representing the Academy as an officer, Lavoisier was denied permission to have the members choose their own officers. The internal reform of 1785 combined some categories of membership into one class and intensified the need to differentiate classes of membership. See McKie (1952: 342–346).
20. McKie (1952: 342) notes that Borda and Lavoisier worked together in the Bureau of Consultation of Arts and Crafts.
21. This latter point about Napoleon's criticism is made in a Personal Communication from Martin S. Staum. Perhaps Napoleon's alleged unilateral decision in 1801 stemmed from the Institute's failure to resolve a disagreement between scientific and political criteria for choosing a voting method.
22. Borda's method is not compared in the 1785 *Essai*, but some of Condorcet's later works such as the *Essai sur les assemblées provinciales* (1788) explicitly attack the Borda method.
23. A good example of this difference is François Lanthemas' "Les elections et du mode d'élire par listes épuratoires," which was written for a journal published by Condorcet. This article does not mention Condorcet's theoretical ideas.
24. The jury theorem relies on Laplace's rule for uncertainty so that each outcome is assumed to have an equiprobable chance of occurring. Under risk, a dominant consideration in politics, these probabilities are not equiprobable.
25. Another related issue is the interpretation of the jury theorem's assumption about binary choices. In principle, complex decision tasks involving the selection of  $m$  correct choices from  $n$  alternatives (where  $m > 1$  and  $n > 2$ ) can be broken down into a sequence of binary decisions so that the jury theorem can be applied. But even if this is possible, Condorcet's model may not be a good approximation for the group probability of making a specific complex decision under different voting systems. See Urken (1986).
26. Reading the introduction to and beginning of the 1785 *Essai* only can create an ambivalent impression of the relation between preferences and competencies. For instance, Black (1958: 170) says that Condorcet's theory breaks down when more than one candidate is preferred by a majority. Although Condorcet argues that this problem can be solved by ascertaining the probability that each candidate is the correct choice, Black complains that this argument is not derived from Condorcet's model. Black (1958: 176) says that [I]t is a pity that on this crucial ques-

tion his argument should be so fragmentary. However, Michaud (1985a, 1985b) and Young (1989) have shown that Condorcet regarded his argument as complete even though it was not derived from a more general model of voting processes.

27. After the revolution, there was also ambivalence in the Academy, but it is not clear if it was benign.

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