Electing Popes: Approval Balloting and Qualified-Majority Rule

Josep M. Colomer; Iain McLean

Josep M. Colomer and Iain McLean

Electing Popes: Approval Balloting and Qualified-Majority Rule

Social choice theory has explored the puzzles and paradoxes of voting since 1951. Among its main findings are that no choice system can satisfy all of the apparently minimal conditions of fairness and logicality; that every reasonable electoral system is manipulable; and that when majority rule fails to produce a unique winner, it may fail catastrophically.[1]

Some of these points were understood long before the twentieth century. In the eighteenth century, Condorcet was the first to show that cycles are possible in majority rule. According to Condorcet, winners are those candidates who prevail over each of their opponents in exhaustive comparison; yet, such a winner may not exist. Whenever there are at least three voters and at least three options, the cyclical majority, $A > B > C > A$ (where $>$ means "wins a majority against"), is always possible. In the nineteenth century, Charles L. Dodgson (aka Lewis Carroll) applied what we would now call game theory to analyse optimal strategy for voters and parties. Various writers, culminating in Duncan Black, realized the interconnection between stability and the number of issue dimensions. With one issue dimension, and only mild further assumptions, majority rule is stable. Hence, a good choice system will select the unique Condorset winner, without cycling. However, if the number of voting dimensions is two or

Josep M. Colomer is Professor of Political Science at the Higher Council of Scientific Research, Barcelona, and Georgetown University. He is the author of *Game Theory and the Transition to Democracy* (Aldershot, 1995); *Political Institutions in Europe* (London, 1996). Iain McLean is Professor of Politics, Oxford University. He is the author of "E. J. Nanson, Social Choice, and Electoral Reform," *Australian Journal of Political Science*, XXXI (1996), 369–385; coauthor, with Alistair McMillan and Burt L. Monroe, of *A Mathematical Approach to Proportional Representation: Duncan Black on Lewis Carroll* (Boston, 1996);

1 Kenneth Arrow, *Social Choice and Individual Values* (New York, 1951); William H. Riker, *Liberalism against Populism* (San Francisco, 1982); Allen Gibbard, "Manipulation of Voting Schemes: A General Result," *Econometrica*, XLI (1973), 587–601; Mark Satterthwaite, "Strategy-Proofness and Arrow's Conditions," *Journal of Economic Theory*, X (1975), 187–217; Richard D. McKelvey, "General Conditions for Global Intransitivities in Formal Voting Models," *Econometrica*, XLVII (1979), 1085–1111.

more (say, if voters are split by nationality and also, independently, by religious faction), then simple majority rule is likely to be unstable and prone to cycling.[2]

A few ancient and medieval authors—for example, Pliny the Younger, Ramon Lull, and Nicholas Cusanus—also considered voting theory in an axiomatic way, and the magistrates of Venice developed a sophisticated electoral system that was difficult to manipulate. Their precocious insights into strategic voting and agenda manipulation—issues that are still current—push back the invention dates of such procedures as rank-order count, exhaustive pairwise voting, and approval voting by several centuries. All of the ancient and medieval choice theorists worked in the context of practical elections and electoral systems in the Roman Senate or the medieval Church. This article shows that the Christian church generated several innovations in voting procedures in the late Middle Ages, including qualified-majority rule and approval balloting, and that Church legislators had sophisticated responses to crucial features of voting. Our sources, where not cited more explicitly, are the standard collections of medieval canon law.[3]

FROM DIVINE UNANIMITY TO TWO-THIRDS MAJORITY   During the late Middle Ages, the Catholic Church devised clear and efficacious decision rules to protect its autonomy and its temporal power. The choice of rules to elect the pope was particularly important, since the Christian church can be viewed as a traditional monarchy in which the "royal" (papal) powers are based officially on God's will. For many centuries, lack of rules provoked

2 M. J. A. Nicholas de Caritat, Marquis de Condorcet, *Essai sur l'application de l'analyse à la probabilité des décisions rendues à la pluralité des voix* (Paris, 1785); McLean and Fiona Hewitt, *Condorcet: Foundations of Social Choice and Political Theory* (Brookfield, Vt., 1994); McLean, Alistair McMillan, and Burt L. Monroe, *A Mathematical Approach to Proportional Representation: Duncan Black on Lewis Carroll* (Boston, 1996); Duncan Black and Ronald A. Newing, *Committee Decisions with Complementary Valuation* (Glasgow, 1951); Black, *The Theory of Committees and Elections* (Cambridge 1958).

3 McLean and John London, "The Borda and the Condorcet Principles: Three Medieval Applications," *Social Choice and Welfare*, VII (1990), 99–108; McLean and Arnold B. Urken, *Classics of Social Choice* (Ann Arbor, 1995); Marji Lines, "Approval Voting and Strategy Analysis: A Venetian Example," *Theory and Decision*, XX (1986), 155–172. For medieval canon law, see also Angelo M. Cherubini (ed.), *Bullarium Romanum novissimum* (Rome, 1638); Emil Friedberg, *Corpus Juris Canonici* (Leipzig, 1879); Paul Fabre and Louis Duchesne (eds.), *Le Liber Censuum de l'Eglise romaine* (Paris 1889–1952), 3v.; Norman Tanner, *Decrees of the Ecumenical Councils* (Washington, D.C., 1990), translated from *Conciliorum Oecumenicorum Decreta* (ed. Giuseppe Alberigo et al.) (Bologna, 1973; 3d ed.).

frequent conflicts and schisms, leaving the Christian church under the protection and domination of political powers, especially emperors and Italian noble families. Selecting rules to elect the pope was the result of a several-century process of clarifying (1) who the voters were; (2) how the ballots were to be organized; (3) what decision rules were to be used; and (4) what incentives the procedure was to provide for a sound and quick decision, avoiding strategic maneuvers or long pontifical vacancies.

EMPEROR VERSUS POPE   Peter, the first "pope" of the Christian church, was chosen by the founder of the religion, but apparently Jesus did not prescribe the rules for appointing Peter's successors. Since the pope was the bishop of Rome, whose primacy over the other bishops was only gradually asserted, the procedure of his election was initially similar to that of the other bishops. In certain local churches, it was customary for bishops to choose their successors. Although this practice was forbidden by the council of Antioch in 341 and again by the council of Rome in 465, it survived in Rome until the sixth century. Thereafter, popes occasionally expressed opinions about their preferred successor, but bishops usually were elected by the Christian faithful ("the people")—the clergy and the bishops of the province—under the chairmanship of the metropolitan.

The election of a bishop was conceived as a way to discover God's will. It was guided by unanimity rule, the only rule that could assure the participants that their decision was right. Hence, the maxim "vox populi, vox Dei" (the people's voice is God's voice). The people could propose candidates, but their choices had to be accepted by the bishops of the province and the metropolitan. Thus, popular participation induced consensus and obedience from the faithful rather than opening up the set of choices.

The Pope was elected according to this system for a while. First, lay members of the Roman Church—especially nobles, military officers, magistrates, and other high officers of the Empire—offered several candidates *viva voce*. Then, the clergy proceeded to reduce or to enlarge that list, and, finally, the sixteen bishops of the Roman province settled the matter. This sequence was reflected in the motto of Pope Leo I (440–461): "vota civium, testimonia populorum, honoratum arbitrium, electio clericorum."

This process frequently produced conflicts and schisms. Before Christianity had been officially accepted by the emperor, at least one simultaneous election of two different popes had taken place (in 250, after eighteen months of failure to elect). In 366 and 418, the election of two popes by different factions of the Church provoked hundreds of deaths and the intervention of Roman troops. These conflicts put the Church under political protection for several centuries. Honorius, the emperor, ruled in 420 that if two popes were elected, neither would be valid, and a new election would be held and unanimity required.

A violent, bloody schism in 498/499 induced one of the new popes, Simaccus, to decree that, in the absence of a nominated successor from a deceased pope, a new pope should have the unanimous support of the clergy or, in case of division, the support of the majority. This relatively early attempt to exclude the lay powers and to institute a non-unanimity decision rule could not avert the conflict between a nominated successor and an elected candidate soon thereafter, resulting in the reinstatement of the emperor as arbiter.

Although most of the popes from the fourth to the twelfth century were appointed or confirmed by the emperor, imperial power had begun to dwindle by the eleventh century. "The election decree of 1059 gave the cardinals of the Roman church the decisive part in papal elections, and reduced the emperor's role to a shadow." A decisive shift came with the submission of Emperor Henry III to Pope Gregory VII at Canossa in 1077, followed by the emperor's formal renunciation of the privilege at the Concordat of Worms in 1122.[4]

During the period of imperial control, the quality of those appointed declined, but the emperor always managed to obtain enough support for his candidates to make unanimous agreement on an alternative impossible. Twice in the ninth century, when the former imperial power had weakened, the Church obtained an emperor's renunciation of the right to appoint the pope. New conflicts and schisms, however, immediately led to the reimposition of imperial control.

---

4   H. E. J. Cowdrey, *The Epistolae Vagantes of Gregory VII* (Oxford, 1972), xvii.

The present Catholic church recognizes 159 popes from 1 to 1122 A.D., but at least 31 "anti-popes" were recognized by certain factions. From the mid-ninth to the mid-tenth century, from a total number of twenty-six popes, twelve were removed from office, five sent into exile, and five killed.[5]

THE DIFFICULT UNANIMITY OF DIVINE RIGHT   Pope Gregory VII's *Dictatus Papae* (1075) asserted the primacy of the pope over political powers. Sometimes called a bull, *Dictatus Papae* would be better described as a set of headings for a projected collection of canons. Enforcing papal primacy required intensive legislative activity. It started with Gratian (1139–1140), and the following 100 years saw papal approval of four enlarged canon law codes. Gregory's correspondence illustrates "the practical application of the maxims of papal authority, which Gregory had laid down in the Dictatus Papae," although scholars have pointed out that many of the later compilations did not cite Gregory.[6]

After 1311, no new canon law codes were adopted until 1918, and again in 1983. The canonists wrote extensively about election procedures, but most of them do not focus on voting rules. Nor do they seem to contain many significant innovations in practical terms. The Church required an orderly succession of its monarch. New rules emerged from successive decisions about partial aspects of the question. The first was a papal bull of 1059—also a canon of the Council of Rome—that excluded the laity from the election of the pope (Nicholas II, *In nomine Domini*). It reserved priority in the election to the cardinal–bishops, who were entrusted with gaining the assent of the cardinal–priests and the cardinal–deacons, as well as the approval of the other members of the clergy and the people. The role of the emperor was reduced once again to mere acceptance of the Church's decision. Although France, Germany, and Spain tried to exercise their veto against

5   All of these numbers remain the subject of some dispute. See Gaetano Moroni, "Cardinal," in *Dizionario de erudizione storico ecclesiastica* (Venice, 1891), IX, 272–318; X, 5–26; T. Ortolan, "Election des Papes," in Alfred Vacant and E. Mangenot (eds.), *Dictionnaire de théologie catholique* (Paris, 1939), IV, 2282–2319. Specific data for the calculations in this study are in Jean Gaudemet, *Eglise et cité. Histoire du droit canonique* (Paris, 1994).
6   Cowdrey, *Epistolae Vagantes*, xxvii. Cf. J. Gilchrist, "The Reception of Pope Gregory VII into the Canon Law (1073–1141)," *Zeitschrift der Savigny-Stiftung für Rechtsgeschichte, kanonistische Abteilung*, LIX (1973), 35–82.

certain candidates for pope, this tactic now had to be implemented through some faction of cardinals.[7]

This procedure did not avert conflict either. Three twelfth-century elections produced eight anti-popes and only nine "official" popes in less than fifty years. In the absence of direct appointments, the Church came up with three ways to achieve unanimous agreement in the event of dissension among the electorate: "acclamation," "scrutiny," and "compromissum." In 1215, the Fourth Lateran Council instituted them for all Church elections, in its document *Quia propter.*

Acclamation, also known as "quasi-inspiration," corresponded most closely to the expectation that voters would have divine inspiration. Yet, elections by acclamation were rare, and even participants complained that they were induced more by the enthusiastic and threatening roar of the crowds than by any natural rallying of voters around a single candidate. Compromissum signified the delegation of final choice to a small commission whenever long sessions and repeated failures showed unanimous agreement to be unlikely. However, since this option had to be adopted by unanimity as well, it was not a frequent resource either.[8]

Scrutiny, that is, voting, was the most common procedure, but new intellectual devices were needed to create apparent unanimity when it did not exist. The most noteworthy was the *sanior et maior pars*—the "sounder and greater part." According to a

---

7 For canonists' writing on voting rules, see especially Gerardus Franses (ed.), *Summa "Elegantius in iure divino" seu Coloniensis (1169)* (New York, 1969); Ernest Adolph Theodor Laspeyres (ed.), *Bernardi Papiensis, Summa Decretalium, cap. II, "Bernardi Summa de Electione" (1178)* (Graz, 1956); Romualdo Trifone (ed.), "Guiglelmo Nassone, *Lecturae e Summae,* section 'Ad quod capitulum vacante sede' (c. 1234)," *Rivista di Storia del Diritto Italiano,* II, (1929), 242–260; Paul Viollet (ed.), "Guillaume de Mandagout, *Tractatus de electionibus (c. 1285),*" in *Histoire littéraire de la France* (Paris, 1914), xxxiv; Henrici de Segusio, Cardinalis Hostiensis, *Summa Aurea,* "De electione, & electi potestate" (1574–1581) (Turin, 1963; new ed.); *Primum Decretalium Librum Commentaria,* "Electione, & electi potestate" (1581) (Turin, 1965; new ed.). We have also examined writings by Ruffinus (1157–1159), Stephanus Tornacensus (c. 1160), Bernardus Compostellanus (c. 1178), Simon von Bisignano (c. 1179), Panormitanus (Nicholas de Tudeschis), and Baldo degli Ubaldi (c. 1350). Johannes Dominicus Mansi (ed.), *Sacrorum conciliorum nova et amplissima collectio* (Venice, 1759–1793), XIX, 897, 907.

8 For the election of Gregory VII in 1073, as reported by the pope himself, see Jacques-Paul Migne (ed.), *Patrologia Latina* (Paris, 1853), CXLVIII, 643–734; Alexander Murray, "Pope Gregory VII and His Letters," *Traditio,* XXII (1966), 149–201; Ian S. Robinson, *The Papacy 1073–1198: Continuity and Innovation* (Cambridge, 1990), 59–60.

(rather reiterative) modern literature about canon laws and exegeses, "saniority" referred not only to the priority role given to cardinal–bishops, but also to the merits of candidates and voters—their zeal and dignity (including age and length of time in official capacity, that is, seniority and hierarchy). These qualities were considered relevant because voting was conceived as a way to discover the truth. But the "sanior pars" often did not coincide with the "maior pars." In lower elections, the determination about which was the "sanior" part in a divided electorate was usually submitted to an arbiter, such as the metropolitan bishop or even the pope, but no such arbiter existed for the election of the pope after 1122.[9]

A TYPICAL SCHISM   The election of 1130 illustrates the difficulties of applying the unanimity rule. As shown in Table 1, thirty-eight cardinals participated. Gregoria Papareschi, one candidate, was a cardinal–deacon and member of the Frangipani family, which had been protected and promoted by Honorius II, the previous pope. Pietro Perleoni, his rival, who was popular in Rome, was a cardinal–priest and also a member of a noble family—this one favored by Calixtus II, an earlier pope.

Initially, the election was made in compromissum by a commission of eight cardinals. The college agreed to recognize the commission's choice, and each of the three orders of cardinals in the college elected its own representatives. The commission decided in favor of Papareschi, afterward called Innocent II, by five votes to three.

The members of the commission tended to prefer their own kind. Most of the cardinal–deacons and cardinal–bishops supported Papareschi, and most of the cardinal–priests supported

9   Adhemer Esmein, "L'unanimité et al majorité dans les élections canoniques," in *Mélanges Fitting* (Montpellier, 1907); Edoardo Ruffini Avondo, "Il principio maggioritario nella storia del Diritto Canonico," *Archivio Giuridico "Filippo Serafini,"* IX (1925) 15–67; Leo Moulin, "Les origines réligieuses des techniques électorales et délibératives modernes," *Revue Internationale d'Histoire Politique et Constitutionelle,* III (1953), 106–148; *idem,* "Sanior et maior pars. Studio sull'evoluzione delle tecniche elettorali negli ordini religiosi dal VI al XIII secolo," *Studi Politici,* VI (1959), 48–75; Alexis Petrani, "Genèse de la majorité qualifiée," *Apollinaris,* XXX (1957), 430–438; Gaudemet, "Unanimité et majorité (Observations sur quelques études récentes)," in *Etudes historiques à la mémoire de Noël Didier* (Paris 1960), 149–162; Robinson, *Papacy.*

Perleoni—both in the whole college and in the commission—in proportions of three to two. However, as Table 1 shows, even though a majority of the commission—its members elected separately by the three orders of the college—preferred Papareschi, a majority of the college preferred Perleoni. This discrepancy led a majority of cardinals to reject the election by the commission and to elect their preferred candidate instead, now called Anacletus II. The existing rules were not much help. Although Papareschi (Innocent II) enjoyed the favor of the majority of the sanior pars in the sense of higher dignity—that is to say, the cardinal-bishops—Perleoni (Anacletus II) had the support of the maior pars, including the senior (oldest) members of the college.

Innocent had to flee Rome, but he commanded political support in France, Germany, and England, and Church support from bishops in Spain and Lombardy. Anacletus was recognized in Rome, Sicily, and Scotland, but was considered the anti-pope. Thus, as during other disputes, some monasteries had two abbots and two priors, some parishes two priests, and so on. The schism lasted for eight years.[10]

Table 1 Divisions in the Papal Election of 1130

VOTERS		VOTES BY CANDIDATE, COLLEGE		VOTES BY CANDIDATE, COMMISSION	
		PAPARESCHI (DEACON)	PERLEONI (PRIEST)	PAPARESCHI (DEACON)	PERLEONI (PRIEST)
Cardinal–bishops	6	4	2	2	0
Cardinal–priests	23	7	16	1	2
Cardinal–deacons	9	6	3	2	1
Total	38	17	21	5	3
Winner		Perleoni (Anacletus II)		Papareschi (Innocent II)	

NOTE   Exact data of voters for each candidate in every order of cardinals—including the names of voters and the pope who had nominated them—can be found in Onuphrio Panvinio, *Epitome Pontificum Romanorum . . .* (Venice, 1557): 99–106; and "Romanorum Chronicum," in *Historia B-Platinae de Vitis Pontificum* (1611). Modern authors are less reliable.

10   Our source for this account is Onuphrio Panvinio, *Epitome Pontificum Romanorum. A S. Petro usque ad Paulum IV. Gestorum (videlicet) electionisque Singulorum, & Conclavium Compendiaria Narratio* (Venice, 1557). See also Franz Josef Schmale, *Studien zum Schisma des Jahres 1130* (Köln, 1961).

THE EFFICACIOUS BUT SLOW RULE OF TWO-THIRDS   Such
conflicts led to the adoption of two-thirds majority rule by Pope
Alexander III (himself previously in competition with an anti-
pope) during the Third Lateran Council in 1179. The rule of
two-thirds had once been operative in certain Roman municipal
curia—albeit not as a decision-making instrument but as a quorum
requirement—as well as in the election of abbots. This and other
qualified-majority rules also saw use in several Italian communes
of the Middle Ages. Alexander III's six-month stay in Venice
during 1177, forging reconciliation with the Emperor Frederick
Barbarossa who had supported the anti-pope, may well have
exposed him to the city's sophisticated voting procedure to elect
a doge and induced him to adopt this more efficient, non-
unanimity rule for elections in the Church soon thereafter.[11]

Together with the new decision rule, the canon of 1179
stipulated equal voting rights for the members of the three orders
of cardinals (abolishing the priority of the cardinal–bishops). The
division of voters into three parts, from which the agreement of
two was required, was not arbitrary. The scrutineers and inspectors
of election returns had to comprise one member from each of the
three orders. Giving equality to all of the cardinals in voting might
have been an indirect way to suggest that a coalition of members
from at least two of the three orders would be necessary. This
interpretation is also a possible reading of the text, which states
that the pope will be the candidate elected and accepted by "two
parties" (*Licet de evitanda, 1,* 10). Yet, the basic aim of the qualified
majority of two-thirds seems to have been the formation of a large
coalition of cardinals. Hence, a two-thirds winner often would
have resulted from a compromise between supporters of different
candidates. As contemporary analyses note, once a candidate was
elected, the losers would have had to persuade *a majority* of the
winner's original supporters to change their mind. Faced with this
requirement, the losing coalition could hardly have been expected
to continue the fight.[12]

11   Ruffini Avondo, "Il principio maggioritario"; *idem, I sistemi di deliberazione collettiva nel
medioevo italiano* (Turin 1927); Ladislas Konopczynski, *Le Liberum veto. Etude sur le développement
du principe majoritaire* (Paris, 1930); Marshall W. Baldwin, *Alexander III and the Twelfth Century*
(New York, 1968); Murray, *Reason and Society* (Oxford, 1978); Lines, "Approval Voting."
12   Alberigo et al. (eds.) *Oecumenica Concilia,* 2; Donald G. Saari, *Geometry of Voting* (Berlin,
1994), 15–16.

Recent research in social choice theory has proven the invulnerability of the two-thirds rule to disequilibrium or cycles. Specifically, Caplin and Nalebuff have shown that the rule of 64 percent guarantees a single winner under conditions of concavity in voter preferences—meaning that, when more voters prefer intermediate candidates than the average of those favoring extremes, an unbeatable proposal exists, and no cycles are possible. In general, the majority rule needed to ensure such a situation in a n-dimensional issue space is no higher than $1-[n/(n+1)]^n$. Hence, this rule is equal to 55 percent for two-dimensional spaces and to 57 percent for three-dimensional spaces, and, as n increases, its limit is just under 64 percent.

To approach the matter differently, for three candidates, "it is impossible to have a cycle where each candidate beats another candidate by receiving more than 2/3 of the vote." The general rule that makes cycles impossible is equal to $(n-1)/n$—n, in this case, being the number of candidates. Hence, the two-thirds rule used to elect the pope produces a stable outcome with up to three candidates, a number that might be expected from a college of voters with three orders. Although electors did not necessarily vote by order in blocs, three just happens to be the largest number of simultaneous popes to have been appointed. Saari has derived the following condition for generic stability: q-majority rule is generically stable iff $k \leq 2q - n$, where $q =$ the threshold number required to carry a proposal; $k =$ the number of issue dimensions; and $n =$ the number of votes cast.[13]

Note that the formal findings in social choice theory just presented refer to the number of dimensions in the issue space and to the number of candidates. However, both dimensions and candidates are, to some extent, endogenous to the decision rule. If doctrinal or ideological allegiances are not restrictive for voters' choices (as in many papal elections), cardinals likely to lose have an incentive to introduce new candidates defined by personal character or other idiosyncratic dimension, in order to divide

13 *Issue space* is a technical term from social choice theory. If opinions are divided along more than one dimension—for instance, about religious belief and about nationality—they can be mapped onto a diagram where one axis (say, the x axis) represents the possible positions on issue 1 and another (say, the y axis) represents the possible positions on issue 2, thus creating an issue space. The positions of individuals within that space can be mapped using Cartesian coordinates.

voters' preferences further and force larger and more inclusive bargains.[14]

Thus did mathematical precision replace previous discussions about subjectively estimated qualities of candidates and voters. As Pope Gregory X stated, "Non zeli ad zelum, nec meriti ad meritum, sed solum numeri ad numerum fiat collatio" ("Not zeal to zeal, nor merit to merit, but solely numbers to numbers are to be compared." VI° *Decretalium*, lib. 1, tit. VI, cap. 9). Popes and canonists identified the maior pars with the sanior pars. In the words of Pope Pius II about his own election in 1458, "What is done by two thirds of the sacred college [of cardinals], that is surely of the Holy Ghost, which may not be resisted."[15]

This quantitative approach was also consistent with other legal provisions of the time: first, with secret vote (finally adopted as the formal rule in the sixteenth century, although used earlier), which makes any discussion about the qualities of voters impossible; and second, with the rule against absentee votes, which resulted not so much from expediency as from the idea that people were more apt to make informed decisions when they are together, which prefigured the arguments of Rousseau and Condorcet about majority choice. The two-thirds rule was later adopted for other procedures in the election of the pope. In an election by compromissum, although unanimity was the standard, two-thirds of the commission was sufficient to decide. In acclamation, at least two-thirds of the cardinals had to participate in any tumultuous, decisive demonstration for a candidate. The rule of two-thirds also came into play in elections of bishops and abbots.[16]

The two-thirds rule produced the desired stability, but it had unintended consequences. Negotiations to form a sufficiently large coalition provoked extremely long delays and vacancies. The

14 Andrew Caplin and Barry Nalebuff, "On 64%-Majority Rule," *Econometrica*, LVI (1988), 787–814; *idem*, "Aggregation and Social Choice: A Mean Voter Theorem," *ibid.*, LIX (1991), 1–23; Saari, *Geometry of Voting*, 92–93; *idem*, *Basic Geometry of Voting* (Berlin, 1995), 62; *idem*, "The Generic Existence of a Core for *q*-rules," *Journal of Economic Theory*, IX (1997), 219–260; Riker, *The Art of Political Manipulation* (New Haven, 1986); *idem* (ed.), *Agenda Formation* (Ann Arbor, 1993).

15 Florence A. Gragg and Leona C. Gabel (eds.), *Memoirs of a Renaissance Pope: The Commentaries of Pius II* (New York, 1959), 88.

16 Jean-Jacques Rousseau, *Du Contrat Social* (Paris, 1762), II, iii and IV, ii; McLean and Hewitt, *Condorcet*, 34–43.

electors in 1216, 1241, 1243, 1261, 1265, and 1268–1270 took several months to reach a decision, in several cases resorting to compromises in commission. In 1243 (and, according to Ruffini Avondo, in 1216) the civil authorities, under popular pressure, reacted to cardinals' slowness by locking them up. In 1241, the senator of Rome (that is, the head of civil administration) confined the cardinals to an old, unhygienic building, guarded by police. He was able to elicit a decision only by threatening to have the corpse of the dead pope exhumed and shown publicly in full regalia. After another deliberation that started in 1268 and lasted more than two years without an agreement, the public besieged the cardinals in the episcopal palace, removing the roof and allowing nothing but bread and water to go inside. According to a contemporary joke, the roof was removed in order to let "the Holy Spirit receive an unhampered entrance." A new pope was elected on this occasion by compromissum after a record vacancy of 34 months. The two-thirds rule produced efficacious and rather stable outcomes, at the price of long delays in decision making. This is now recognized as a classic trade-off in social choice.[17]

THE SURPRISING CONCLAVE   The practice of locking cardinals up led Pope Gregory X to establish a formal procedure for their seclusion, known as the *conclave* (from the Latin, *with key*); it was approved by the council of Lyon in 1274, under the name, *Ubi periculum*. Since Gregory had not been a cardinal before his election, "he did not take the college's interests much into consideration." *Ubi periculum* aimed to obtain a quick decision and prevent strategic maneuvering in papal elections. Similar institutions had been established in the Dominican constitution of 1228, as well as in such communes as Venice and Piacenza in 1229 and 1233, respectively.[18]

The conclave had the cardinals gathered in a single room in the papal palace, the doors of which were walled up and secured by soldiers. No cardinal was to have more than two servants with

17   Ruffini Avondo, "Il principio maggioritario." See also Peter Herde, "Election and Abdication of the Pope: Practice and Doctrine in the Thirteenth Century," *Proceedings of the Sixth International Congress of Medieval Canon Law*, VII (1985), 411–436; André Vauchez, *Apogée de la Papauté et expansion de la Chrétienté (1054–1274)* (Paris, 1990).
18   Herde, "Election and Abdication," 418; Ruffini Avondo, "Il principio maggioritario"; Walter Ullmann, *A Short History of the Papacy in the Middle Ages* (London, 1972).

him or any communication with the outside world. Food entered through a guarded window. After the fourth day, the menu was restricted; after the ninth, it was reduced to bread, water, and wine. The cardinals received no income until they reached a collective decision.

Although some of these hardships were later softened, they motivated the cardinals to reach a common decision. Whether lack of nutrition was a factor is uncertain, but the illness, and sometimes even the death of cardinals (six cardinals died during the election of 1287 alone), tended to precipitate agreement among the remaining participants. Since bribery, coercion, or explicit arrangement between cardinals was forbidden under penalty of excommunication and annulment of the election, large coalitions were difficult to build, and candidates were often elected on the basis of their immediate, apparent appeal rather than careful evaluation of their merits or religious characteristics.

The first election of a pope under this procedure, in 1276, took only one day. The following popes suspended the application of conclave, whereupon long delays reappeared: more than seven months in 1277, six months in 1281, almost eleven months in 1288, and twenty-seven months from 1292 to 1294. This counter-proof of conclave's efficacy moved Celestine V, the pope elected in 1294, to reestablish it.

THE UTILITY FUNCTION OF CELESTINE V   The twenty-seven-month deadlock of 1292 to 1294 was broken when the name of Peter of Morrone, the "octogenarian hermit," was introduced. His election seems to have resulted from a snowballing effect—more and more electors clutching at a candidate, however unlikely, to break the impasse. Although the official reason given for his election was "inspiration," we cannot reconstruct how much admiration of his sanctity, desire to end the stalemate, or calculation that any error would be short-lived, entered into it.[19]

The hermit pope took the name, Celestine V. His term of office was short but momentous. Elected in July 1294, in September he reintroduced the conclave regulations of Gregory X; in December, he abdicated and returned to his hermit's cell. Celestine V was even more of an outsider than Gregory X. Not

19   Herde, "Election and Abdication," 427.

only had he not been a cardinal before becoming the pope; his behavior afterward suggests that he derived no particular benefit from his position. A pope who had previously been a cardinal, and/or needed the cooperation of the cardinals for his continued comfort in office, might not have wanted, or been able, to impose the reforms of Gregory X and Celestine V. But Celestine's unusual provenance afforded him a certain immunity. As with other constitutional actors (such as Thomas Jefferson and James Madison), Celestine was able to write a successful constitution because he had little personal interest in exploiting his own office. Short, successful conclaves lasting a few days or less have become the norm since Celestine's election.[20]

The effects of the conclave on the winning candidates were puzzling. Frequent surprises gave rise to the popular saying, "He who enters the conclave a pope, leaves it a cardinal," which achieved the status of an "empirical law" in the fourteenth century. In the "great schism" of Avignon in 1378, the same cardinals who had elected the pope in conclave under strong political pressures cancelled their decision on grounds of duress once they realized the kind of man that they had chosen. Within a few months, they chose a new one.

According to the basic rules of Gregory X and Celestine V, which are still enforced, (1) voters must be cardinals; (2) the decision threshold must be set above two-thirds of the voters; and (3) the cardinals must be secluded in conclave in order to reach a quick and sound decision. These policies embodied successive partial reforms, each adopted in reaction against unintended effects of previous decisions. The Church's legislators and the canonists seem to have refrained from thinking about voting too technically out of the belief that outcomes ought to correspond to God's will. Yet, they had to face real problems in voting matters by importing or inventing ad hoc devices for particular aims.

APPROVAL BALLOTTING IN THE FOURTEENTH CENTURY   From the late thirteenth to the early seventeenth century, the ballot used in

20   The rules of conclave, their enforcement, and successive modifications can be found in D.J.C.B., *Los Papas y el Cónclave* (Barcelona, 1878); Lucio Lector, *Le conclave* (Paris, 1894); Ottolan, "Conclave," in Vacant and Mangenot (eds.), *Dictionnaire de théologie catholique* (Paris, 1938), III, 707–727. Other rules about the timing of the election are in *Ordo Romanus*, XII. See Migne (ed.), *Patrologia Latina* (1844/1845), LXXVIII, cols. 1063–1106, esp. 1097–1100.

papal elections by the cardinals was a form of what is now called "approval voting." This rule is not contained in any papal bull or decree, but in a lower-rank set of provisions—the religious equivalent of parliamentary rules of order—called *Ordinarium Sanctae Romanae Ecclesiae*, written by Jacobi Gaytani a short time after the definitive enforcement of the conclave rules. Gaytani, a protégé of Pope Boniface VIII, who nominated him as a cardinal, was the cardinal–deacon in charge of the Church of Saint George of the Golden Veil in Velabro. He attended five conclaves from 1305 to 1352.[21]

Gaytani specified the voting procedure, both by scrutiny and by compromissum, the latter acceptable only in case of need. In voting by scrutiny, the ballot is so written that the voter can choose either one or several candidates. Gaytani advised the cardinals not to choose many candidates "for decency and expediency," although there is no formal restriction about the matter. Election results take into account all nominations received by every candidate. This form of ballot seems to have been used in the forty-one conclaves held from 1294 to 1621 (the last conclave before new regulations establishing the categoric vote—*Eterni Pacis*, 1621, and *Decet Romanum Pontificem*, 1622).

According to social choice theory, approval voting (AV) tends to promote consensual, relatively high social-utility winners; it satisfies several relevant criteria, such as monotonicity; and it is relatively easy to implement. Although AV has some pitfalls—for example, the inability to guarantee that a Condorcet winner or a majority winner will win—its advantages make it a highly desirable procedure for single-winner elections with more than two candidates—as in the election of popes.

APPROVAL BALLOTING WITH TWO–THIRDS MAJORITY RULE   Approval voting is usually associated with single-winner elections, the winner being the candidate with the most votes. Using it with two-thirds majority rule can have bizarre consequences; it can

21   Steven Brams and Peter Fishburn, "Approval Voting," *American Political Science Review*, LXXII (1978), 831–847; *idem, Approval Voting* (Boston, 1983); Hannu Nurmi, *Comparing Voting Systems* (Dordrecht, 1987); Samuel Merrill, *Making Multicandidate Elections More Democratic* (Princeton, 1988). Gaytani's writings about procedures in papal elections can be found in Johanne Mabillon and Michaele Germain, *Musei Italici. Tomus II. Complectens Antiquos Libros Rituales Sanctae Romanae Ecclesiae* (Paris, 1689), 245ff. See also Moroni, "Cardinals." who claims that Gaytani was Boniface's nephew.

give several candidates more than the required proportion of votes to win. This undesirable occurrence, which nullifies an election, is more probable the smaller the number of candidates, the more homogeneous the preferences of voters regarding candidates, and the greater the incidence of voting for multiple candidates. In an extreme case, each of two candidates can obtain two-thirds of the approval votes when only one-third of voters choose more than one candidate, if each of the two candidates that these voters approve is the single preference of another third of the voters. Approval voting can also produce no winner. The probability that no candidate will obtain two-thirds approval is greater the higher the number of candidates, the more dispersed the preferences of voters, and the smaller the number of approval votes on the ballot. In conclaves that failed to elect a candidate, further rounds of approval voting were implemented. There was no elimination threshold between one round and the next; candidates were always eligible even if they had not obtained a single vote in previous rounds.

A second relevant device is the vote *in accessit,* or "access," which made its earliest appearance in the 1455 conclave. If no candidate obtains a sufficient majority, a voter can add a candidate or candidates for whom he has not previously voted but who has received votes in the first ballot. Precedent for this tactic might have been a practice of the Roman senate, whereby a senator who wanted to share a position with another physically moved to join the proposal's promoter, giving an immediate visual display of majority and minority support in any binary option. The cardinals began access rounds with public declarations of support, followed by a scrutineers' certificate that the new proponents had not previously voted for the same candidates. To facilitate proof, every ballot was marked with a personal but anonymous stamp and included the voter's signature folded inside. To preserve voting secrecy even from scrutineers, however, the access round was soon transformed into a new voting round with written ballots on which the cardinals could choose between giving new approval to one or several candidates and confirming their previous choice.[22]

---

22 Betty Radice, *The Letters of the Younger Pliny* (Harmondsworth, 1969), 220–224; Riker, *Political Manipulation,* 78–88.

The procedure in access rounds was similar to that in the preceding round with approval ballot, except that only candidates who had already obtained at least one vote were eligible for additional approval. Every access round was tied to a voting round, and every failure to determine a winner produced successive rounds of voting and access that provided voters with dynamic information about others' preferences and their collective results.

Access counterweighs some of the expected consequences of approval balloting, especially by altering voters' strategies to select a winner, but also by prolonging the number of voting rounds. In order to model voters' rational strategies under approval balloting, we impute trichotomous preferences to every voter—(1) preferred candidates, (2) acceptable (though not preferred) candidates, and (3) nonacceptable candidates—allowing that some of these categories may be void for some voters. Approval voting with the usual plurality rule permits the identification of two strategies: (S1) Voters who prefer candidates with slim or uncertain chances to win always vote their preferred candidates and usually vote their acceptable ones. (S2) Voters who prefer candidates with good chances to win vote only for their preferred candidates.

As a result of these strategies, winners receive all of the support of those who prefer them and most of the support of those who find them acceptable. Candidates with extreme views win only if their majority followers feel free to vote for them because none of their nonacceptable candidates has a chance to win, that is, they enjoy the support of a large, compact—even biased—majority facing several dispersed minorities. However, under approval balloting with access, strategic voters should approve fewer candidates. A voter who can express approval of an acceptable candidate in a later round—as in access—can hold back in the first round to determine whether his preferred candidate is likely to win. Voters tend to use strategy S2, however, increasing the probability that no candidate will obtain sufficient votes to win.

Given scanty information regarding other voters' preferences and candidates likely to win, as were the cardinals when they arrived in conclave, early results resemble polls in mass elections. Voters whose preferred candidates appear not to have sufficient backing in early rounds can expand their set of approved names—

including the most acceptable, or least objectionable, among the front-runners. Yet, as Brams and Merrill have noted, poll information also gives voters incentives to "truncate" sincere preferences, that is, to vote for fewer candidates than those they find acceptable, thus hastening the outcomes.[23]

ECCLESIASTICAL ORDERS AND POLITICAL POWERS   The difficulty of reaching agreement in most papal elections was accentuated by the numerous candidates and the cardinals' dispersed preferences. The greater the number of parties and candidates, the more likely it was that an unexpected candidate would become pope. In late medieval and early modern times, ecclesiastic orders (bishops, priests, and deacons) and political allegiances were the variables that complicated papal elections.

Since the end of the eleventh century, the college of cardinals has comprised seven cardinal–bishops, twenty-eight cardinal–priests, and eighteen cardinal–deacons—a total of fifty-three and a two-thirds majority threshold of thirty-six. Hence, in spite of its supreme rank in the hierarchy, the order of cardinal–bishops had no electoral power by itself, even if it acted as a unit. The members of the two other orders could form a more than sufficient majority, whereas a coalition of bishops and either of the two other orders was not sufficient to win. This situation probably moved Pope Nicholas II to confer "principal judgment" to the cardinal–bishops (as noted above). Yet, further levelling, when the rule of two-thirds was established, apparently motivated the cardinal–bishops to position themselves as leaders of different factions of cardinal–priests and cardinal–deacons. In 1585, the members of the college increased to seventy, but the new composition (six bishops, fifty priests, and fourteen deacons) maintained the same incentives to form factions.[24]

Faction leaders bartered their support for future appointments, castles, palaces, wealth, or income whenever possible. In some cases, they were even able to maneuver elected candidates into honoring platforms that severely limited their powers—known as "capitulations." Three or four faction leaders usually

23   Merrill, *Multicandidate Elections*; Brams, "Polls and the Problem of Strategic Information and Voter Behavior," *Society*, XIX (1982), 4–11.
24   Data in this paragraph are from Ullmann, *History of the Papacy*, 232; Moroni, "Cardinals," 287.

appeared per conclave, although new coalitions and splits from one conclave to another were normal.[25]

The second basic source of division among the cardinals was their different political allegiances with the main Christian kingdoms in Europe, especially France, the German confederation, and Spain. The council of 1417 in Constance put an end to the "great schism" of Avignon. The twenty-three cardinals of the college were joined by six other bishops for each of the five nation-groups (French, German, English, Spanish, and Italian), creating the total of fifty-three members in the decision body, in order to obtain a wide consensus. It also established the two-thirds rule for the college of cardinals and every group of "national" deputies. The ambassadors from the great powers often visited conclaves to transmit national opinions about candidates.[26]

The emergence of six or seven factions—occasionally as many as ten—at the beginning of conclave sessions was a normal occurrence in late-medieval and early modern times. Usually a committee of independents—the "flying squad" (*squadra volante*)— was formed to bargain with the factions (not unlike the "favorite son" uncommitted delegates at United States party conventions). As suggested above, the endogenous creation of candidates tended to raise the bargaining costs.

FOCAL POINTS IN COALITION-BUILDING   Given the cardinals' penchant for factions, we would expect papal elections to have featured numerous voting rounds, the number of candidates holding relatively stable as the rounds progressed. To test these inferences, we offer interesting, albeit incomplete, data about voting in twenty-four of the conclaves in which approval balloting was in effect. Inevitably, our data are only as good as our sources, which reveal that average participation was about forty cardinals per conclave (with limit values of eighteen and sixty). The number of candidates voted in the first round was generally large, reaching twenty at least once.[27]

25 Lector, *Le conclave;* anon., *Histoire des Conclaves depuis Clement V jusqu'à présent* (Paris, 1689).
26 Michel Mollat du Jourdin and Vauchez, *Un temps d'épreuves (1274–1449)* (Paris, 1990), 108–113.
27 Data in this section not otherwise referenced are from *Histoire des Conclaves,* pages too numerous to list.

Despite the many candidates in the running, individual cardinals limited themselves to only a few. The mean number of candidates nominated per voter seems to have been between 1.5 and 2. Many cardinals did not have sufficient knowledge about candidates to make more than a couple of informed choices, thus bestowing an advantage on well-informed conspirators. Conclave rules imposing silence and prohibiting explicit negotiations among the cardinals, however, had their effect on such collusion. When scrutiny showed that certain cardinals had voted for a suspiciously large number of candidates on one ballot, angry protests from other participants was likely to ensue, thus reducing the potential consensual effects of approval balloting.[28]

The elimination of candidates often resulted from the so-called "exclusion" vote, in which at least one-third of conclave members publicly expressed their disapproval of a candidate. This demonstration showed that the "excluded" candidate could not expect a sufficient majority, even if he had won in previous rounds. It was mainly the practice of nation-party cardinals, representing a vestige of the emperor's former veto right in the conclave.

Certain signals helped to channel votes into one "focal point," that is, a likely winning candidate. The limited information provided by successive rounds of voting could feed conjectures about general preferences and candidates' chances, though unevenly. For example, cardinals who were old, infirm, and uncommitted were particularly liable to change their minds from one round to the next. Candidates who did not gain additional votes or dropped votes along the way were likely to lose support from cardinals, even if they had obtained a plurality or a majority in previous rounds. In contrast, candidates who maintained or increased their votes, even from a modest start, could turn out to be winners.[29]

---

28 In 1559, the secretary of Bartolomé de la Cueva, an old Spanish cardinal, privately asked each member of a conclave to give his master one approval vote, as a gift to show the elder that he had at least one friend. The trick was discovered when seventeen out of thirty-two ballots included that name in their lists. Similar stratagems have been attributed to other cardinals. See D. J. C. B., *Los Papas*, 143–144; Lector, *Le Conclave* 405, 622–623; *Histoire des Conclaves*, 83, 161, 240).

29 "Focal points" were first defined by Thomas Schelling, *The Strategy of Conflict* (Oxford, 1960), 57. For a book-length discussion of coordination in this class of electoral games, see Gary Cox, *Making Votes Count: Strategic Coordination in the World's Electoral Systems* (Cambridge, 1997).

After some time, voting shifts in general tended to increase. Under the threat of privation, or illness, during conclave, cardinals became more apt to enlarge their set of approved names. Entry of new candidates was always possible because the rules called for no elimination threshold. New, unexpected names might emerge as compromises between two blocking coalitions, especially after the exclusions of other candidates—many of them hardly mentioned as papal material a few hours before being crowned. Support for a candidate often snowballed. According to the available data, a successful candidate might obtain 33, 50, or even 100 percent more support in access than in the immediately previous voting round. At least three times, a candidate who received more than half of the votes (on one occasion, 58 percent) lost the election. In many cases, the final winner obtained only one-third or one-fourth of votes in the first round. In 1605, the eventual winner, Leo XI, did not receive even a single vote.

Such results led the Church to abolish approval balloting in 1621/1622. The fact that the inefficacy of approval balloting was due primarily to the countereffects of the rule of two-thirds and the access round was not the reason why ecclesiastical decision makers reestablished categorical voting. The selection of one name per ballot simply made voting easier for the cardinals. The access round, too, went out of style, after the 1903 conclave, without, however, altering the number of rounds per session. Yet, these reforms served only to reduce the information made available to the cardinals throughout the successive rounds and to reinforce the degree of surprise in the final election.

For many centuries, the election of the pope was an occasion of violent conflicts and schisms that weakened the Church and subordinated it to secular powers. These conflicts later gave way to long delays in decision making and, since the end of the thirteenth century, to winning candidates who frequently came as a complete surprise. The history of Church decisions about electoral rules seems to have been driven by successive reactions to unintended, undesirable effects of previous decisions. The change from unanimity rule to two-thirds qualified-majority rule was fortunate, from the perspective of modern social choice literature, since the two-thirds rule makes cycles and unstable decisions for

a limited number of candidates impossible. The trade-off, however, was the time needed to reach a final decision. Although the delays provoked by the requirements of qualified-majority rule were curbed somewhat by the physical and material restraints on the cardinals while locked up in conclave, as well as by the cardinals' prerogative to approve more than one candidate, the rule of two-thirds was sufficiently demanding to make large agreements difficult, especially in light of the vast number of factions, the scanty information about candidates, and the restricted communication between voters mandated by conclave rules. As a consequence, the cardinals deferred the consensual decisions usually encouraged by approval balloting to later rounds, thus keeping the voting sessions long. The intuitive signals that they developed were an important recourse against further delay.

This article demonstrates that the successive reforms in the rules for electing popes during the Middle Ages can be explained as a series of rational responses to political problems faced by the Church and by successive electors. Although the particular forms that these developments took could not have been predicted in advance, because they depended on certain contingencies (such as the unusual utility function of Celestine V), the process as a whole is illuminated from the perspective of social choice theory.