Condorcet, Social Mathematics, and Women's Rights

Guillaume Ansart

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Guillaume Ansart

Often called “the last of the great philosophes,” Marie-Jean-Antoine-Nicolas de Caritat, marquis de Condorcet, is still mostly remembered today for his last work, *Esquisse d’un tableau historique des progrès de l’esprit humain*. The original was published in 1795, one year after his death during the Terror, and an English translation, *Outlines of an historical view of the progress of the human mind*, appeared in Philadelphia in 1796. A late but classic expression of the philosophes’ faith in reason, science, and progress, the *Esquisse* has been characterized as the testament of the Enlightenment, a work perhaps less remarkable for its intrinsic qualities than as the canonical formulation of a fading ideology. According to an all-too-common idée reçue, the author of the *Esquisse* epitomized the illusions and excessive optimism of the Enlightenment.

However, this reductive view ignores the fact that Condorcet was also an original thinker often very much ahead of his time. He pioneered the application of mathematics to the study of social phenomena, and was one of the first authors to openly support full political rights for women. His self-termed “Social Mathematics” anticipated the rise of a modern social science based on probability theory and statistics, while the 1790 publication of “Sur l’admission des femmes au droit de cité” [“On the Admission of Women to the Rights of Citizenship”] preceded both Olympe de Gouges’s *Déclaration des droits de la femme et de la citoyenne* [Declaration of the Rights of Woman and the Female Citizen] (1791) and Mary Wollstonecraft’s *Vindication of the Rights of Woman* (1792). These two...
original aspects of Condorcet’s thought—his theory of social mathematics and his feminism—have received renewed attention for the past four or five decades, yet little of this work examines the connection between them. I propose here to explore this relationship between feminism and social mathematics in Condorcet’s political and scientific writings.

The theory of voting holds a central place in Condorcet’s vision of a social science. His feminism follows a parallel orientation and focuses primarily on the question of voting rights for women. Complicating the issue is the fact that Condorcet considered voting from two distinct perspectives: either as the expression of a natural right or as a mode of rational collective decision making. Because he bases his defense of women’s voting rights mostly on his understanding of voting as a natural right, my discussion will concentrate on this particular approach to the topic. Nevertheless, the implicit relationship between women’s right to vote and the concept of voting as a means of rational decision making—a concept so fundamental to Condorcet’s political philosophy—offers another interesting, admittedly more speculative, direction of investigation which, we shall see, also deserves to be pursued.

VOTING AS THE EXPRESSION OF A NATURAL RIGHT

Natural law, Condorcet argues, has too often been invoked to justify arbitrary and restrictive constructions of sexual and gender differences: “Quelques philosophes semblent avoir pris plaisir à exagérer ces différences: ils ont en conséquence assigné à chaque sexe ses droits, ses prérogatives, ses occupations, ses devoirs, et presque ses goûts, ses opinions, ses sentiments, ses plaisirs; et prenant ces rêves d’une imagination romanesque pour la volonté de la nature, ils ont dogmatiquement prononcé que tout était le mieux possible pour l’avantage commun” (“FA,” 325) [Some philosophers seem to have delighted in exaggerating these differences: consequently, they have assigned to each sex its rights, its prerogatives, its occupations, its duties, and practically its tastes, its opinions, its feelings, its pleasures; and mistaking these dreams of a fantastic imagination for the will of nature, they have dogmatically pronounced that everything was the best possible for the common good].

Instead, Condorcet bases his political theory on the related but simpler concept of natural rights, which he viewed as more objective. For him, these rights precede, and can be defined independently of, any specific form of social organization: “Nous voulons une constitution dont les principes soient uniquement fondés sur les droits naturels de l’homme, antérieurs aux institutions sociales” [We want a constitution based solely on the rights which exist in nature, prior to social institutions]. These rights are also natural in the sense that they can be logically derived from the most basic of human features, the capacity or potential to become a rational, moral agent: “Les droits des hommes résultent uniquement de ce qu’ils sont des êtres sensibles, susceptibles d’acquérir des idées morales, et de raisonner sur ces idées” [The rights of men result simply from the fact that they are sentient beings, capable of acquiring moral ideas and of reasoning concerning these ideas]. It therefore follows that women have exactly the same rights: “Ainsi les femmes ayant ces mêmes qualités, ont nécessairement des droits égaux” (“AF,”
54) [Women, having these same qualities, must necessarily possess equal rights (“AW,” 98)]. Condorcet distinguishes four such rights, the last one implying the right to vote as its minimal form of realization:

1. Security of the individual.
2. Security of property.
3. Universal, nonarbitrary rule of law.
4. Participation in government.

From a political perspective, Condorcet insists, there are no fundamental differences between the sexes. Sexual and gender differences are either the product of education and socialization—and therefore subject to change—or they are simply irrelevant to a discussion of natural rights. The first category includes the different spheres of activity (public versus private) to which men and women have traditionally applied their intellect, as well as their allegedly different senses of morality or justice. Women, it has been said, are guided by their feelings rather than by their reason or conscience. But such differences, Condorcet asserts, are caused by purely social factors: generally excluded from public life, women have directed their intelligence toward different objects and therefore may have developed, for instance, a different sense of justice from that of men. In this respect as in so many others, educational reforms could easily restore the natural equality between the sexes. In the meantime, “si on admettait contre les femmes des raisons semblables, il faudrait aussi priver du droit de cité la partie du peuple qui, vouée à des travaux sans relâche, ne peut ni acquérir des lumières, ni exercer sa raison, et bientôt, de proche en proche, on ne permettrait d’être citoyens qu’aux hommes qui ont fait un cours de droit public” (“AF,” 58) [if reasons such as these were admitted against women, it would also be necessary to deprive of the rights of citizenship that portion of the people who, because they are occupied in constant labor, can neither acquire knowledge nor exercise their reason. Soon, little by little, only persons who had taken a course in public law would be permitted to be citizens (“AW,” 100)].

To the second category, the differences which Condorcet deems irrelevant to the determination of rights, belong those linked to the biological essence of femininity: “Pourquoi des êtres exposés à des grossesses, et à des indispositions passagères, ne pourraient-ils exercer des droits dont on n’a jamais imaginé de priver les gens qui ont la goutte tous les hivers, et qui s’enrhument aisément?” (“AF,” 54) [Why should individuals exposed to pregnancies and other passing indispositions be unable to exercise rights which no one has dreamed of withholding from persons who have the gout all winter or catch cold quickly? (“AW,” 98)], asks Condorcet with dry humor. Would participation in political life distract women from their “natural” domestic duties, especially toward their children? “On n’arracherait pas les femmes à leur ménage plus que l’on arrache les laboureurs à leurs charrues, les artisans à leurs ateliers” (“AF,” 59–60) [Women would be torn from their homes no longer than agricultural laborers from their plows, or artisans from their workshops (“AW,” 101)]. In other words, “les femmes seraient donc dans la même classe que les hommes obligés par leur état à des soins de quelques heures” (“AF,” 60) [women would be in the same position as men obliged by their position in life to engage in several hours work a day (“AW,” 102)].
One frequently alleged difference between men and women especially preoccupied Condorcet: “On a pensé que les femmes, douées des mêmes facultés que les hommes, mais à un degré plus faible, ne pouvaient s’élever à la première de toutes, le génie; qu’elles partageaient tout avec les hommes, excepté le talent de l’invention” (“FA,” 327) [It has been thought that women, endowed with the same faculties as men, but to a lesser degree, could not rise to the first among them, genius; that they shared everything with men, except for the talent of invention]. He returns to this question repeatedly, in the unpublished notes to his “Discours de réception à l’Académie Française” (1782); in the “Lettres d’un bourgeois de New Heaven [sic]” (216; “Letters from New Haven,” 299); in “Sur l’admission des femmes au droit de cité” (54–55; “Admission of Women,” 98); and in the “Fragment sur l’Atlantide,” where the preceding passage appears. Clearly, Condorcet considered it essential to refute the argument of a qualitative difference between the intellectual capacities of the two sexes, for such an argument would have undermined his theory of equal natural rights.

Consequently, Condorcet is very careful to define genius not as a distinct intellectual faculty, but as the result of a greater “force of attention” which itself seems to be a function of physical strength: “On observe que ce don d’inventer ne tient qu’à une seule chose, à la force de l’attention; que cette force d’attention tient, autant que le sentiment intérieur peut l’apprendre, à la constitution physique de la tête. Il n’y a personne qui n’ait senti pour lui-même les limites de cette force d’attention, et dans ce sens elle pourrait tenir à la force physique de cette faculté” (“CN,” 57) [It can be observed that the gift of discovery only pertains to one thing, to the force of attention; that this force of attention is related (so far as introspection can tell) to the physical constitution of the head. There is no one who has not himself experienced the limits of this force of attention, and in this sense it might be related to the physical force of this faculty] (“RS,” 26). The same idea appears in the “Fragment sur l’Atlantide”: “La constitution physique paraît même influer sur l’intelligence, non comme ayant le pouvoir de la modifier, mais comme opposant des obstacles à son activité, ou donnant la force de l’employer avec plus de constance à des travaux plus étendus ou plus pénibles. Elle paraît agir comme une cause accidentelle qui fait que l’on peut donner à l’étude une application plus ou moins forte, plus ou moins suivie” (“FA,” 321) [One’s physical constitution even seems to influence intelligence, not as having the power to modify it, but as opposing obstacles to its activity, or giving one the strength to use it more steadfastly in more extended or arduous tasks. It seems to act as an accidental cause which determines whether one can dedicate oneself to study with more or less intense, more or less constant application].

If a real difference between the sexes exists regarding genius, if it is not purely a product of social causes such as women’s education—which certainly does not favor the development of genius—then it is only a matter of degree, not a fundamental qualitative distinction between the intellectual capacities of the sexes. Such difference is not incommensurable, but reducible to a common measure—that is to say, it is at least theoretically measurable. Condorcet refutes the idea of genius as the sign of an “absolute” difference so as to affirm a basic intellectual equality between men and women from which logically follows their equality in political rights.
When comparing men and women, Condorcet carefully avoids the generalizations and essentializations which can often be found in the philosophical literature of the French Enlightenment. He reasons much like a statistician studying similar, measurable features in different human populations. I quote here four short passages in order to give a good sense of Condorcet’s insistence on a certain type of quantitative argumentation:

Cette inégalité n’en formerait pas une entre les deux sexes, parce qu’elle ne mettrait réellement les femmes qu’au dessous d’un très petit nombre d’hommes et qu’elles resteraient les égales de tout le reste. (“CN,” 57)

This inequality [in the force of attention] would not constitute an [in]equality between the two sexes because it would show only that women are inferior to a very small number of men and are equal to all the rest. (“RS,” 26)

Quand même on admettroit que l’inégalité de force, soit de corps, soit d’esprit, seroit la même qu’aujourd’hui, il en résulteroit seulement que les femmes du premier ordre seroient égales aux hommes du second et supérieures à ceux du troisième, et ainsi de suite. (“LB,” 216)

Even if we agree that women might still not have the same mental or physical power as men, this would mean simply that the best women were equal to the second-best men, better than the third best, and so on. (“LF,” 299)

On ajoute qu’aucune femme n’a la même étendue de connaissances, la même force de raison que certains hommes ; mais qu’en résulte-t-il, qu’excepté une classe peu nombreuse d’hommes très éclairés, l’égalité est entière entre les femmes et le reste des hommes ; que cette petite classe mise à part, l’infériorité et la supériorité se partagent également entre les deux sexes. (“AF,” 55)

It is added that no woman has the same extent of knowledge, the same power of reasoning as certain men. But that only proves that, with the exception of a limited number of exceptionally enlightened men, there is absolute equality between women and the remainder of the men; that this smaller class of men apart, inferiority and superiority are equally divided between the two sexes. (“AW,” 98)

Nous savons que les femmes sont plus faibles; mais quand nous croirions pouvoir rigoureusement conclure de cette infériorité de forces physiques une égale différence dans celles de l’âme ou de l’intelligence, il en résulterait seulement que les femmes ne peuvent s’éléver à la même hauteur que les hommes extraordinaires; mais que celles qui occupent le premier rang dans le sexe peuvent cependant laisser derrière elles la grande majorité de l’espèce humaine. (“FA,” 326)
We know that women are weaker; but even if we believed that we could rigorously conclude from this inferiority in physical strength an equal difference in that of the soul or intelligence, from this would only result the fact that women cannot rise to the same heights as extraordinary men; but those who occupy the first rank in the female sex can nevertheless leave behind them the great majority of the human species.12

Such reasoning points to the use of mathematical tools for comparing human populations. Indeed, two such tools play a preeminent role in the future social science envisioned by Condorcet: systematic charts or tables, where information (facts, measurements, etc.) can be gathered and organized; and the mathematical theory of probability, which is to provide the indispensable interpretive framework needed to read this information correctly.

In his last work on probabilities, “Elémens du calcul des probabilités,” Condorcet outlines a method for drawing up “des tables dont on puisse tirer facilement les résultats qui doivent servir d’élémens dans les applications du calcul des probabilités” [tables from which can easily be obtained the results that are to be used in the applications of the calculus of probabilities].13 He uses the example of a mortality table in which each individual is characterized by ten different “qualities,” each of which admits no more than ten different modifications. Thus each quality as modified in each individual can be represented by a number from 0 to 9. Age at the time of death, for instance, is a quality which can be divided into ten modifications corresponding to ten decades: 0–9, 10–19, 20–29, etc. Examples of other qualities include cause of death, sex and marital status, occupation, and parental history. When more than ten modifications are needed for a particular quality, it can be considered as the combination of two qualities, thereby allowing $10 \times 10 = 100$ modifications. If one were interested in studying the possible correlation between sex and intellectual capacity, one would select such qualities as, for example: sex and marital status, intellectual capacity (assuming, as Condorcet does, that it can be measured), level of education, age, occupation and income, education and occupation of parents, etc. In other words, one would select qualities that can be thought of as having an influence on intellectual capacity. Now, ten qualities each susceptible of ten modifications can produce $10^{10} = 10$ billion different combinations, which is a fairly large number. However, Condorcet argues that his system would make this large amount of information relatively easy to use. First of all, in reality a great many abstractly possible combinations would not occur. Furthermore, in his system each individual would be represented by a number between one and ten billion. For instance, the number 1,204,135,009 would represent an individual who displays the second modification of the first quality, the third modification of the second quality, the first modification of the third quality, the fifth modification of the fourth quality . . . and the ninth modification of the tenth quality (the last quality is represented by a number from 1 to 10 instead of 0 to 9). According to Condorcet, such a method of organizing information would make it simple to find out, for instance, which combinations of two, three, or four qualities never occur, which are common, etc.

Once information has been organized and analyzed in this manner, the results must be interpreted with the help of the mathematical theory of probability. The main problem here is one of statistical inference: how does one estimate the
“real” probability of a phenomenon knowing only a frequency or distribution obtained from observation? A solution to this fundamental problem, which had to be successfully tackled before statistics could develop into a science, emerged during the latter part of the eighteenth century in the works of Thomas Bayes, Pierre-Simon Laplace, and Condorcet himself. Bayes, in his *Essay Towards Solving a Problem in the Doctrine of Chances* (1764, published by Richard Price after Bayes’s death in 1761), first proposed a solution which Laplace subsequently and apparently independently confirmed and extended in his *Mémoire sur la probabilité des causes par les événements* [*Memoir on the Probability of the Causes of Events*] (1774).14

Following the same basic reasoning as Laplace, Condorcet indicates how to calculate the probability that an observed difference between two sample populations (in the proportion of individuals who display a given feature) corresponds to a “real” difference, or the probability that the difference is in fact insignificant (see “Elémens,” 548–49). If the probability that the difference is real turns out to be very high, one then proceeds to an estimation of causes. Condorcet briefly describes the correct method to draw appropriate conclusions in this respect: “Si, au lieu de considérer les questions de ce genre dans leur généralité, on veut examiner séparément les effets de chaque cause dont on regarde l’influence comme possible, il faut prendre, au lieu du nombre total de chaque classe, celui des hommes de chacune d’élles sur lesquels les autres causes agissent également, et qui ne diffèrent que relativement à celle dont on veut examiner les effets” (“Elémens,” 547–48) [If, instead of considering matters of this kind in their generality, one wants to examine separately the effects of each cause whose influence is regarded as possible, one must use, instead of the total number of individuals in each class (sample population), the number of individuals in each on whom the other causes act with equal force, and who only differ in relation to the cause whose effects are to be examined]. To illustrate his point, Condorcet chooses precisely the issue of the influence of sex on intellectual capacity:

C’est ainsi, par exemple, qu’après avoir prouvé, d’après l’observation, qu’il est très-probable que, relativement au talent, les hommes ont de l’avantage sur les femmes, si l’on a considéré la somme totale des hommes et des femmes qui existent dans un pays; on trouveroit que cette probabilité devient presque nulle, si on compare ou les hommes qui reçoivent une éducation suivie, avec le petit nombre de femmes qui ont reçu une éducation semblable, ou bien sur la masse totale les hommes et les femmes qui se sont illustrés sans le concours de l’éducation; et alors il faudroit en conclure que cet avantage ne vient pas de la nature, mais de nos institutions. (“Elémens,” 550)

Thus, for example, after having proved, from observation, that it is very probable that, with respect to talent, men have some advantage over women, if the total number of men and women who live in a country has been considered; one would find that this probability becomes almost zero, if one compares either men who receive a serious education, with the small number of women who have received a similar education, or men and women who have distinguished themselves without the help of education; and from this one would then have to conclude that this advantage does not originate in nature, but in our institutions.
Anticipating modern statistical methods, Condorcet was convinced that such a process would prove gender differences in intellectual capacity to be either the product of social factors or small enough to be irrelevant in relation to natural rights. Moreover, the concept of a measurable, statistical difference enables Condorcet to avoid rigid oppositions not only between “male” and “female” but also between the biological and the social in general. His speculations take him this time in the direction of other modern scientific fields such as sociobiology and evolutionary psychology. In the “Premier mémoire sur l'instruction publique” [“First memoir on public instruction”] he contemplates the possibility that the social might alter the biological after generations, thus revealing a previously inconceivable new potential for human perfectibility: “Il n’est pas aussi chimérique qu’il le paraît au premier coup d’œil, de croire que la culture peut améliorer les générations elles-mêmes, et que le perfectionnement dans les facultés des individus est transmissible à leurs descendants. L’expérience semble même l’avoir prouvé. . . . L’observation des races d’animaux asservies aux besoins de l’homme semble encore offrir une analogie favorable à cette opinion. L’éducation qu’on leur donne ne change pas seulement leur taille, leur forme extérieure, leurs qualités purement physiques; elle paraît influer sur les dispositions naturelles, sur le caractère de ces races diverses” [It is not as chimerical as it might seem at first glance to believe that culture can improve whole generations and that the improvement of individual faculties can be transmitted to their descendants. Indeed, experience seems to have proved this. . . . Observation of domesticated animals seems to offer an analogy consonant with this opinion. The way these breeds have been raised not only changes their size, shape, and purely physical characteristics; it also seems to affect their natural traits and their character].15 Thus, for Condorcet, the border between the biological and the social is not just uncertain but also, perhaps, fluid and changing. In this sense, gender differences are neither biological nor social truths but empirical ones subject to constant revision. As statistical observations, they belong to a new scientific domain of relative and provisional truths.

VOTING AS A MODE OF RATIONAL COLLECTIVE DECISION MAKING

Today, Condorcet is widely recognized as the founder of social choice theory. His two outstanding contributions to the field are known as “Condorcet’s paradox”16 and “Condorcet’s jury theorem.” Only the latter will be discussed here.

The act of voting can be interpreted in at least two distinct, though not incompatible, ways: as a subjective expression of individual preference based on personal interest, passion, prejudice, and the like; or as an objective statement expressing a rational judgment of truth. The latter view seems more adapted to jury trials, decisions by panels of judges, or opinions from committees of experts, while the former, or at least a combination of the former and the latter, seems to better conform to elections by popular vote or legislative decisions in large assemblies. Although Condorcet recognized this complexity, he based his theory primarily on the concept of voting as a rational judgment of truth. In his opinion, the rational understanding of voting signals the fundamental novelty and superiority of modern notions of liberty compared to the practices of ancient republics: “En réfléchissant sur ce que nous connaissons des constitutions des anciens Peuples, on voit qu’ils
cherchèrent beaucoup plus à contre-balancer les intérêts et les passions des différentes Corps qui entroient dans la constitution d’un Etat, qu’à obtenir de leurs décisions des résultats conformes à la vérité” [Reflecting on what we know of the constitutions of ancient peoples we see that they were much more concerned to counterbalance the interests and passions of the different bodies that formed part of the constitution of a state than to obtain results in their decisions that were conformable to the truth].17

Decidedly modern, Condorcet believed that the Ancients had been preoccupied only with managing conflicting group interests within a communitarian outlook and had had no knowledge of natural rights or universal justice. Modern liberty, on the other hand, had a nobler task to accomplish: the gradual implementation of Truth and Justice through Reason. Voting, coupled with the formation of an enlightened public opinion, would be central to this task.

Condorcet’s jury theorem can be formulated in this way: suppose \( N \) voters choosing between two alternatives and voting independently—that is, using their own independent judgment; suppose also that each voter has the same competence \( p \), with \( p > \frac{1}{2} \) (\( p \) is the probability that each voter will be correct, assumed to be superior to \( \frac{1}{2} \); that is to say, each voter is simply assumed more likely to be right than wrong); then, the competence of the jury (the probability that the jury will render a correct majority decision) will be superior to \( p \) and will tend toward 1 (certainty) as \( N \) grows larger. Unfortunately, the reverse is also true: if \( p < \frac{1}{2} \), overall jury competence will be inferior to \( p \) and will tend toward 0 as \( N \) grows larger.18

The jury theorem raises several important questions. First, as to its sphere of applicability: Condorcet himself never used the expression “jury theorem” and regarded the validity of his findings as extending, for example, to large assemblies making legislative decisions. In his “Essai sur l’application de l’analyse à la probabilité des décisions rendues à la pluralité des voix,” he likens individuals in a range of voting situations to jury members enunciating a judgment of truth. Second, while the hypothesis \( p > \frac{1}{2} \) appears quite reasonable, the reverse hypothesis, \( p < \frac{1}{2} \), seems at first glance completely implausible. How could the competence of a voter fall below that of a coin toss? However, Condorcet insists that this pessimistic assumption is not only plausible but corresponds to reality for a great many potential voters. Combined with ignorance, special factors such as the influence of tradition, prejudice, or passion can explain why voters are often, in fact, worse judges than pure chance. Therefore, raising general levels of education and spreading enlightenment must be the first priority for supporters of democracy: “Des assemblées nombreuses conviendraient . . . à un pays où, par le progrès des lumières, il y aurait une grande égalité entre les esprits, quant à la justesse de leurs jugemens et à la vérité des principes d’après lesquels ils régleroient leur conduite, et c’est le seul cas où l’on puisse attendre d’assemblées très-nombreuses, ou de sages loix, ou la réforme des mauvaises loix” (“DP,” 31) [Numerous (i.e., large) assemblies would . . . be appropriate to a country in which, as a result of the progress of enlightenment, there was a great equality between minds, as to the soundness of their judgments and the truth of the principles according to which they governed their conduct; and this is the only case in which either wise laws or the reform of bad ones can be expected from very numerous assemblies (“IE,” 50)].

The jury theorem demonstrates that if voting is to be a mechanism of rational decision making and not merely an expression of “la volonté du plus grand
nombre, c’est-à-dire, la volonté du plus fort” (“DP,” 81) [the will of the greatest number, that is to say, the will of the strongest], voters must be well-educated and informed. Condorcet’s support for universal suffrage and full voting rights for women is therefore inseparable from his call for equal access to education for all, including women (see IP, 96–104; “PI,” 134–40). For elections to lead to the truth, voters must be reasonably competent, equal, and independent. To guarantee voters will be so is one of the principal functions of a national system of public education, even though in some respects education can magnify inequality:

Il est impossible qu’une instruction même égale n’augmente pas la supériorité de ceux que la nature a favorisés d’une organisation plus heureuse.

Mais il suffit au maintien de l’égalité des droits que cette supériorité n’entraîne pas de dépendance réelle, et que chacun soit assez instruit pour exercer par lui-même, et sans se soumettre aveuglément à la raison d’autrui, ceux dont la loi lui a garanti la jouissance. (IP, 61–62)

It is impossible for instruction, even when equal, not to increase the superiority of those whom nature has endowed more favorably.

But to maintain equality of rights, it is enough that this superiority entail no real dependence: that each individual be sufficiently instructed to exercise for himself the rights guaranteed him under the law, without subjecting himself blindly to the reason of another. (“PI,” 106)

Education creates independent, autonomous individuals. This is crucially important not only for Condorcet’s theory of voting (in the logic of the jury theorem, voter independence increases the probability of reaching a correct collective decision) but also for his theory of natural rights: only truly autonomous individuals can take full advantage of their rights. Equality is here redefined, essentially, as independence.

Condorcet’s social philosophy is not one of strict egalitarianism, certainly, but neither does he accept a purely abstract and legal conception of equality. Some degree of concrete equality is necessary if equality of rights is to have any reality at all: “Vainement aurait-on déclaré que les hommes ont tous les mêmes droits; vainement les lois auraient-elles respecté ce premier principe de l’éternelle justice, si l’inégalité dans les facultés morales empêchait le plus grand nombre de jouir de ces droits dans toute leur étendue” (IP, 61) [It would be vain to declare that all men enjoy equal rights, vain for the laws to respect (this) first principle of eternal justice, if the inequality in men’s mental faculties were to prevent the greatest number from enjoying these rights to their fullest extent (“PI,” 105)]. Without universal public instruction there can be no actualization of human rights: “Les lois prononcent l’égalité dans les droits, les institutions pour l’instruction publique peuvent seules rendre cette égalité réelle” (IP, 78) [Laws decree equality of rights; but public instruction alone can make this equality real (“PI,” 119)].

**STATISTICS AND THE PARADOX OF HUMAN RIGHTS**

Condorcet started his career as a mathematician and published a considerable amount of research in the fields of calculus and probability theory. His work in applied mathematics exploring the potential uses of probability theory in the study
of social phenomena represents one of the most original and visionary contributions to science in the late eighteenth century. It would be a mistake, however, to think that his political convictions were somehow the product of mathematical calculations. Quite the opposite: the political positions of the philosophe often determined the mathematician’s choice of field of application. And Condorcet often maintains, as in the case of the jury theorem or the basic moral and mental equality between men and women, that probabilities only confirm what simple reason, unaided by numbers, intuitively suggests. At the same time, he sees probabilities as indispensable for the persuasion of less enlightened members of society, and for the determination of more complicated questions. Probability theory and statistics thus provide another weapon for philosophy to marshal in its fight against ignorance and prejudice.

But the connection between Condorcet’s social mathematics and his stance on women’s suffrage and human rights in general goes deeper. It is no historical coincidence that in the West the rise of statistics corresponded roughly with the rise of liberal bourgeois democracy. There is an undeniable analogy between the abstract individual endowed with natural rights and the equally abstract object of statistical studies: “In statistical affairs . . . the first care before all else is to lose sight of the man taken in isolation in order to consider him only as a fraction of the species. It is necessary to strip him of his individuality to arrive at the elimination of all accidental effects that individuality can introduce into the question.” In fact, the analogy is more profound; in both cases, the concept of “individual” involves a similar paradox. Joan Wallach Scott describes the paradox at the core of Enlightenment political philosophy, especially the discourse on human rights, as follows: “On the one hand, the individual is the abstract prototype for the human; on the other, the individual is a unique being, a distinct person, different from all others of its species.” Like many of his contemporaries, Condorcet recognized this paradox, but unlike most of them he alleged that the paradox neither could nor should be solved, no matter how problematic. He understood better than other political thinkers of his time that the paradox represented a central constitutive element of the philosophy of human rights. To dispense with the paradox—if it were possible—would be to dispense with human rights discourse altogether.

We have already noted that Condorcet defined natural rights in the most abstract terms. He derived them directly from the basic nature of (wo)man, “un être sensible, capable de raisonnement et d’avoir des idées morales” (“LB,” 213) [a sentient being, capable of reason and moral ideas (“LF,” 297)]. Certainly, it would be difficult to find a purer expression of the notion of abstract identity between individuals. At the same time, we have also observed that the concept of independence occupies a central place in Condorcet’s political theory. Even before his conversion to universal suffrage during the Revolution, the principle of voter independence was preeminent in his thought. The jury theorem assumes that voters will base decisions on their own independent judgment. If voters vote by blocks, blindly following the judgment of a leader or a party line, this reduces the number of independently formed opinions and consequently the probability that the collective decision will be correct. Condorcet also invokes the axiom of voter independence to justify granting full voting rights exclusively to property owners who do not need to work to support themselves. In the very same texts, he could present such
a property-based restriction as in fact “natural,” because it only eliminates people who cannot be regarded as having an independent will, and dismiss any purely gender-based limitation as “absurd” because entirely arbitrary. After changing his mind on the matter and becoming an advocate of universal suffrage, he continued to affirm the paramount importance of voter independence. In his view, one of the chief functions of public education will be to counter the ill effects of the division of labor on the working class, so that the fate of the nation would not depend “en partie, d’hommes hors d’état d’être dirigés par leur raison, et d’avoir une volonté qui leur appartienne” (IP, 78) [in part on men incapable of acting in accordance with their reason and of forming a will of their own (“PI,” 119)].

Condorcet was therefore acutely aware—again, more so than most of his contemporaries—of the paradox that necessarily underlies the theory of natural and universal rights. One must simultaneously assert (and deny) the sameness and equality of individuals, on one hand, and their autonomy and difference on the other. The discourse on human rights can only exist within this tension. After all, there is no point in having elections, or in predicing natural rights in general, if one does not assume a minimum degree of difference and independence—whether of will or reason—between otherwise abstractly identical individuals.

Statistical studies imply a similarly paradoxical dialectic of identity and difference, and the individual as conceived by the statistician appears like a close cousin of the bearer of rights. The former, as radically as the latter, must be stripped of all individuality and reduced to an abstract entity equivalent to other abstract entities. But statistical laws result from the multiple acts of individuals and thus reflect a combination of “individual irregularity with aggregate regularity.” Large populations show striking regularities, but individual behavior, by the very logic of probability and statistics, is assumed to remain unpredictable. The principle of individual autonomy and difference, then, is no less essential than the axiom of abstract identity, both to the statistician and to the theorist of natural rights. This is one of the many points—and I would argue one of the most revealing—where the preoccupations of Condorcet the mathematician join with the convictions of Condorcet the human rights advocate.

CONCLUSION

Condorcet’s radical feminism set him apart from the vast majority of his contemporaries. The revolutionary public sphere was or rapidly became hostile to participation by women and soon enforced a strict, gendered separation between public (male) and private-domestic (female) spheres of activity. As Joan Scott notes, “the political individual was . . . taken to be both universal and male; the female was not an individual, both because she was nonidentical with the human prototype and because she was the other who confirmed the (male) individual’s individuality.” Yet the question remains as to whether, as Joan B. Landes claims, “the exclusion of women from the bourgeois public was not incidental but central to its incarnation”—in other words, whether “the bourgeois public is essentially, not just contingently, masculinist.” Using Condorcet and Wollstonecraft as counter-examples, Keith Michael Baker convincingly argues against the sweeping nature of Landes’s assertion. Indeed, it would be very hard to find anything in the
works of Condorcet to indicate that he “subscribe[d] to the republican—ultimately, Rousseauist—demand for a reform of domestic habits,” or that “like the great majority of his compatriots Condorcet [was] made nervous by overly ambitious public women,” as Landes writes.

At the same time, Landes and Baker agree on the existence of a tension within revolutionary ideology between the celebration of republican virtue and the discourse of universal rights, between republicanism and liberalism, or between “the liberty of the Ancients” and “the liberty of the Moderns,” to borrow from Benjamin Constant’s famous 1819 lecture. Landes and Baker also agree that this tension was at least temporarily resolved in favor of ancient republicanism, recast in Rousseauist terms. But this does not mean, Baker rightly observes, that the bourgeois public sphere was “essentially, not just contingently, masculinist.” Only the Rousseauist discourse of republican virtue can be considered inherently hostile to public women. Moreover, the revolutionary public sphere should be seen as a transitional formation. Hence it may be that its masculinist character was neither essential nor contingent but simply necessary in historical terms. Although long prepared, the fairly sudden collapse of the ancien régime and the monarchy left a troubling vacuum. To many, ancient republicanism, rather than the modern liberalism embodied by Condorcet, offered itself as a convenient and attractive substitutive principle of social order. Landes herself appears to point in the direction of such an interpretation: “Having revolted against the older patriarchy of the father-king . . . fraternal men imposed on women a legally secured definition of politics—this time, the patriarchy of brothers and honorable husband-fathers.”

To be sure, the ideology of republican virtue did not disappear after Thermidor or even during the decades following the Revolution, but the emergence of a resolutely modern and inclusive liberalism, not the revival of classical republicanism, constitutes the most significant and enduring political legacy of the French Enlightenment. It is Condorcet’s outstanding contribution to this legacy to have produced, as early as the late eighteenth century, theories of social mathematics and natural rights (including women’s) which form a comprehensive and coherent rational discourse on society—a discourse whose emancipating potential is still unfolding today.

NOTES


2. On Condorcet’s feminism, see notably: David Williams, Condorcet and Modernity (Cambridge: Cambridge Univ. Press, 2004), 158–71; Christine Fauré, “La pensée probabiliste de Condorcet et le


3. Condorcet probably had Rousseau in mind here. (Translations by the author unless otherwise indicated.)

4. Condorcet, “Lettres d’un bourgeois de New Heaven [sic] à un citoyen de Virginie, sur l’inutilité de partager le pouvoir législatif entre plusieurs corps” (1787), in SE, 213; “Letters from a Freeman of New Haven to a Citizen of Virginia on the Futility of Dividing the Legislative Power among Several Bodies,” in CF, 297. (Hereafter cited as “LB” and “LF,” respectively.)


7. In the “Lettres de New Haven” (216; “LF,” 299), Condorcet identifies this as Voltaire’s opinion. It was indeed a common idea among the philosophes, and on this point, Rousseau agreed with them.


9. Cf. this general observation on the interconnection between mind and body: “En examinant le développement de notre faculté de sentir, de nous souvenir, de juger, de raisonner, et les phénomènes qu’elle nous présente, il est impossible de séparer ces opérations des phénomènes d’un autre genre qu’éprouve cet être permanent que nous appelons notre Corps” (Condorcet, “Sur la persistance de l’âme” [“On the survival of the soul”], in SE, 631) [In examining the development of our capacity to feel, to remember, to judge, to reason, and the phenomena that it presents to us, it is impossible to separate these operations from phenomena of another kind which affect the enduring being that we call our Body].

10. Besides, as Condorcet observes with some degree of irony, “sans doute, on ne prétendra point n’accorder le droit de cité qu’aux seuls hommes de génie” (“AE,” 55) [it is not pretended that the rights of citizenship should be accorded only to men of genius (“AW,” 98)].


12. The statistical intuition expressed in these last four quotations is quite remarkable. Not only did Condorcet anticipate modern methods of measuring intelligence such as IQ tests, he also isolated
the sole difference between the sexes in terms of IQ distribution. Like many human traits, IQ scores across a large population follow a normal or Gaussian distribution represented by a bell-shaped curve: the top corresponds to the mean value/score (which is also the most common score in this case); other scores are symmetrically distributed around the mean and decrease in frequency on both sides as they get further away from it. With respect to possible gender differences, modern studies comparing IQ distributions among men and women have yielded virtually identical means. At the same time, a small but significant and consistent difference has been observed in another measure; IQ distributions for men show a slightly greater variance from the mean than do IQ distributions for women. In other words, men are somewhat overrepresented at both the extreme low and extreme high ends of the spectrum. This is indeed the only kind of gender difference in intellectual capacity which Condorcet seems prepared to regard as plausible.


14. Laplace’s general solution is as follows: if \( x \) represents the unknown “real” probability that a given phenomenon or event will occur (\( x \) can be any number of the infinite series between 0 and 1, with equal probability); \( 1 – x \) the unknown probability that the phenomenon will fail to occur; if the phenomenon has occurred \( m \) times and failed to occur \( n \) times in the past; then the probability that it will recur \( p \) times and fail to occur \( q \) times in the future is: \( P = \int_0^1 x^m (1 – x)^n \, dx / \int_0^1 x^p (1 – x)^q \, dx \).
If one wants to estimate the probability that the phenomenon will recur at the next trial, then \( p = 1 \) and \( q = 0 \), and the formula becomes simply: \( P = (m + 1) / (m + n + 2) \) (which is smaller than the observed frequency: \( m / (m + n) \)).
If one wants the probability that a phenomenon which has never failed to occur in the past will recur at the next trial, then \( n = 0 \), \( p = 1 \), and \( q = 0 \), and \( P = (m + 1) / (m + 2) \) (which is different from absolute certainty \( P = 1 \) but gets closer and closer to it as \( m \) grows larger).

Condorcet’s approach to statistical inference relies on similar formulas (see Daston, Classical Probability, 278–83; Granger, Mathématique sociale de Condorcet, 75–80).


16. The paradox can occur when voters choose between three or more alternatives. Then, for the vote to be fair and accurate, each voter’s preference must be expressed in the form of a complete ranking of all the alternatives and each such ranking interpreted as a series of pairwise comparisons. However, the aggregation of coherent individual preferences can lead in this case to self-contradictory collective choices: for example, A is better than B, B is better than C, C is better than A (a cyclical majority). Condorcet’s description of the paradox as well as his proposed solution can be found in the “Discours préliminaire” to “Essai sur l’application de l’analyse à la probabilité des décisions rendues à la pluralité des voix” (1785), in SE, 7–177, 58–69 (hereafter cited as “DP”); “Preliminary Discussion” to “An Essay on the Application of Probability Theory to Plurality Decision-Making,” in CF, 120–30.


18. See “DP,” 29–46; “IE,” 48–50. The formula Condorcet established to reach these conclusions is: \( V = \sum_{k=0}^{n} \binom{n}{k} v^k e^{ek} \), where \( V \) is the collective competence of the jury, \( v \) the competence of each voter, \( e = 1 – v \) the probability that each voter will be wrong, \( n \) the number of voters, and \( m \) the minimum required majority (meaning here the total number of votes necessary to form the majority required). \( \binom{n}{k} \) is the binomial coefficient, or the number of possible combinations of \( k \) elements in a set of \( n \) elements (in this case, the number of possible combinations of votes yielding a given identical outcome). Each term \( \binom{n}{k} v^k e^{ek} \) of the sum represents therefore the probability to have a correct decision supported by \( k \) voters, and the sum will contain as many terms as there are possible values of \( k \) between \( m \) (minimum majority) and \( n \) (unanimity).
This equation has three variables: $v$, $n$, and $m$; but there are only two ways to increase the competence of a jury: to increase the individual competence of the jury members or to increase their number (if $v > \frac{1}{2}$). Increasing $m$ only increases the probability that a jury decision, once rendered, is correct. Also, it can be objected that Condorcet’s model is too simple and that in reality voters will always have different levels of competence. The “Essay” in fact suggests ways to refine the model in this direction by using probability intervals for $v$ and treating it as a random variable instead of a constant. Such refinements, however, do not alter the general conclusions drawn from the initial model (see “DP,” 125–26).

19. Besides, Condorcet had virtually no empirical data to work with, so his statistical investigations had to remain purely theoretical. The only numerical information available at the time had to do with births and deaths. The age of statistics in Europe began after the end of the Napoleonic wars. On the history of probability theory and statistics from the late eighteenth century on, see Ian Hacking, The Taming of Chance (Cambridge: Cambridge Univ. Press, 1990).


23. See in particular “LB,” lettre 2 (210–45); “LF,” letter two (295–316); “Essai sur la constitution et les fonctions des assemblées provinciales” [“Essay on the Constitution and Functions of the Provincial Assemblies”] (1788), in SE, 283–94, article one: “Du droit de cité” [On the right of citizenship]. Condorcet strongly objected to the common argument made against granting women the right to vote—that their inferior social status precluded them from exercising a will or a reason of their own. One injustice can never be used to justify another and no specific social group can be regarded as inherently dependent.


25. Scott, Only Paradoxes to Offer, 8.

26. Landes, Women and the Public Sphere, 7.


28. Landes, Women and the Public Sphere, 117.

29. Benjamin Constant, “De la liberté des anciens comparée à celle des modernes” [“On the Liberty of the Ancients Compared with that of the Moderns”].

30. Landes, Women and the Public Sphere, 148.