MASTER-MIND LECTURE

Condorcet and the Meaning of Enlightenment

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I. Enlightenment at full strength

0.999993: THIS IS THE PROBABILITY calculated in 1785 by Marie-Jean-Antoine-Nicolas de Caritat, Marquis de Condorcet, to express the acceptable risk of a false conviction in a just society.[1] It is also perhaps the most concise expression of everything that is at once attractive and repellent, coldly calculating and warmly visionary about not just Condorcet but the Enlightenment credo he embodied, for friends and foes alike. His friend, the *salonnière* Julie de Lespinasse, who always apostrophised him as 'le bon Condorcet', cheered him on in his fight for 'the cause of reason and humanity';[2] his later foe, the conservative literary critic Charles-Augustin Sainte-Beuve, reviled him as the 'extreme product' of eighteenth-century rationalism, 'a monstrous brain' hell-bent on 'remaking the human heart'.[3]

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[1] Condorcet expressed the probability as a fraction rather than as a decimal: 144,767/144,768: M. J. A. N. Condorcet, *Essai sur l'application de l'analyse à la pluralité des décisions rendues à la pluralité des voix* (Paris, Imprimerie Royale, 1785), pp. cxiii–cxiv.

[2] Letter from Julie de Lespinasse to Condorcet, May 1775, in Charles Henry (ed.), *Lettres inédites de Mademoiselle de Lespinasse à Condorcet, à d'Alembert, à Guibert, au Comte de Crillon* (Paris, 1887), p. 149. Unless otherwise specified, all translations are my own.

[3] Charles-Augustin Sainte-Beuve, 'Oeuvres de Condorcet', *Causeries du lundi*, 3 (1868), 260–77 at p. 268.

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Both descriptions hit the mark, and what is more, they hit the mark in the same place. Condorcet was not a Janus-faced figure riven by contradictions and blurred by ambiguities, so that proponents and opponents can pick and choose among contrasting aspects of his thought, all equally his. Although his thinking on various scientific, philosophical, and above all political matters certainly traced a developmental curve over the course of his life, he was remarkably consistent on the main points. Indeed, his relentless consistency accounts for much of what is remarkable in his writing. A mathematician by training, he followed the implications of general propositions with bulldog tenacity, lead where they may. The endpoints he reached in his reasoning can seem, read over two centuries later with the benefit of twenty-twenty hindsight, either dazzlingly prescient—e.g. his defence of female suffrage or prediction of doubled human life expectancy—or weirdly wrongheaded—e.g. his attempts to quantify the reliability of witness testimony or the likelihood that a tribunal of a certain construction would arrive at a true verdict. Yet it is all of a piece, and it is, as Lespinasse and Sainte-Beuve both recognised, Enlightenment *pur*, love it or hate it.

This is my motive for returning to the Marquis de Condorcet (1743–94). As a mathematician, as a philosopher, as a political theorist (much less as a political strategist), he was not a Master Mind, even as measured against only his eighteenth-century competitors in these domains. But as an Enlightenment thinker, as a thinker about, for, and of Enlightenment, he remains without peer. Whatever Enlightenment means, Condorcet lived, breathed, and radiated it; he even died for it. Right now, when the meaning of Enlightenment is probably more ferociously debated than at any time since the period in which Enlightenment first became a fighting word, Condorcet is a guide to what is at stake.

In order to appreciate just how embedded Condorcet's life and works were in the project of Enlightenment, it will be helpful to recall at least the outline of his career as mathematician, *philosophe*, and politician. Marie-Jean-Antoine-Nicolas Caritat, Marquis de Condorcet, was born into a family of the military nobility stemming from the Midi in France. His father was killed in the siege of Neuf-Brisach a few days after he was born; he was raised by a pious mother, who came from a bourgeois family in Picardy, and schooled by Jesuits in Reims and the Collège de Navarre in Paris. There he took up the study of mathematics and became a protégé of the mathematician and *Encyclopédist* Jean d'Alembert, who introduced him to the salons of Mlle de Lespinasse and Mme Helvétius and paved his way to election to the Académie Royale des Sciences in

1769. Condorcet became Perpetual Secretary of this body in 1776 and a lifelong defender of scientific academies against revolutionary detractors like Marat. Starting in the 1770s, largely through his friendship with Anne-Robert-Jacques Turgot, the reforming minister to Louis XVI, he became increasingly interested in economic, social, and political reform. He sought to wed his mathematics to his liberal politics in numerous works that attempted to apply probability theory to insurance, the design of tribunals, and voting procedures. He held the office of inspector of the mint, was inducted into the Académie Française in 1782, and married Sophie de Grouchy, herself the translator of Adam Smith and Tom Paine into French.

From the outbreak of the French Revolution in 1789, he threw himself into liberal politics, first as a member of the Paris Municipal Council and, after 1791, as a delegate to the Legislative Assembly and, after 1792, the Convention. He was especially active in projects on the reform of weights and measures and public instruction. He fell foul of the Jacobin-dominated Convention by publishing a ferocious attack on its hurriedly drafted constitution; on 8 July 1793 a warrant was issued for his arrest. He was hidden by a Mme de Vernet for nine months in what is now the rue de Servandoni by the Jardin du Luxembourg; it was here that he wrote the first draft of the *Sketch of a Historical Picture for the Progress of the Human Mind*. On 24 October 1793 he was condemned to death *in absentia*; on 25 March 1794, convinced that he was a danger to Mme de Vernet, he fled his refuge. He was soon apprehended and found dead in his prison cell—some say of a stroke, others by poison administered by his own hand—on 27 March 1794, a martyr for—some say of—the Enlightenment.[4]

My aim in this lecture is to view the meaning of Enlightenment afresh through Condorcet's eyes. This is a peculiarly disorienting experience, a perspective that is at once familiar and surpassingly strange. I hope to be able to show that both familiarity and strangeness are obverse and reverse of the same coin, the Enlightenment currency of *lumières*.

I shall begin with the notion of *lumières* itself, a word best translated as 'enlightenment', but this time written minuscule, preserving the associations of wisdom and deeper insight that still cling to the word in English (as in the phrase 'spiritual enlightenment'). In Condorcet's usage, *lumières* is at once an inner and outer light, a quality that can be acquired through

[4] The story of Condorcet's final days is movingly told by Charles Coulston Gillispie, *Science and Polity in France: The Revolutionary and Napoleonic Years* (Princeton, 2004), pp. 326–38.

instruction, the mastery of a body of knowledge, but which also requires the internalisation of certain habits of thought and feeling. Although the content of *lumières* may be as straightforward as the principles of arithmetic and political economy, its inner workings involve a moral component, a sensibility and an attitude towards the world that more closely resembles the illumination of the sage than the expertise of the technocrat.

Yet for Condorcet, one of the principal—if not *the* principal—expression of *lumières* was calculation, understood not only as a technique, but also as a form of intelligence and a spiritual exercise. I shall explore these multiple senses of calculation in the second part of my paper. One might regard this fondness for calculation as simply the *déformation professionelle* of the mathematician. It is true that Condorcet's work, especially on the applications of probability theory to everything from legal contracts to the design of tribunals, does include some striking examples of quantiphrenia.[5] But Condorcet's concept of *calcul* extended far beyond mathematics, even if it began there. To calculate was for Condorcet an education in both epistemology and civics, a way of analysing ideas in order to fix the boundary between the known and the unknown as well as an exercise in poltical autonomy, an assertion of independence against priestcraft and tyranny.

In Condorcet's view, the most effective weapon of priests and despots was not violence but fear. Like many Enlightenment thinkers, he was steeped in the works of the Roman Epicureans and Stoics; Lucretius and Seneca were still commonplace points of reference for an educated elite schooled (as Condorcet was) by Jesuits.[6] Lucretius had prescribed a heavy dose of natural philosophy to dissolve religious terrors: 'This terror of mind, therefore, and this gloom must be dispelled, not by the sun's rays nor the bright shafts of day, but by the aspect and law of nature.'[7] In his final work, *Sketch of a Historical Picture of the Progress of the Human Mind* (post-1795), written while in hiding at the height of the revolutionary Terror in 1793, Condorcet characteristically went one better

[5] On this aspect of Condorcet's work, see Gilles-Gaston Granger, *La Mathématique sociale du marquis de Condorcet* (Paris, 1956); Keith Michael Baker, *Condorcet: From Natural Philosophy to Social Mathematics* (Chicago, 1975); and Lorraine Daston, *Classical Probability in the Enlightenment* (Princeton, 1988).

[6] On the *philosophes*' debt to Latin classical authors, see Peter Gay, *The Enlightenment: An Interpretation*, 2 vols., vol. 1: *The Rise of Modern Paganism* (New York, 1977).

[7] Lucretius, *On the Nature of Things*, trans. W. H. D. Rouse, rev. Martin Smith (Cambridge, MA, 1992), p. 99.

than Lucretius: 'There does not exist any religious system, any supernatural extravagance not founded on ignorance of the laws of nature.'[8] Hence to study the laws of nature was to combat the fear that kept humanity in chains. But Condorcet also identified fears among the philosophers who knew too much, as well as among the people who knew too little. Philosophers, including natural philosophers, who cultivated a praiseworthy scepticism concerning the dogmas of religions and discarded systems were prey to epistemological doubts, the fear of making a mistake. The fear of the ignorant led to slavery; that of the learned, to paralysis. How Condorcet sought to combat both variants, the one with *lumières* and the other with calculation, will be the topic of the third section of my paper. I shall conclude with some reflections on Enlightenment, enlightenment, and the probability 0.999993.

II. *Lumières*

Amongst the Condorcet manuscripts preserved at the Bibliothèque de l'Institut in Paris there is a draft of a letter from an imaginary Picard gentleman to the bishop of Amiens on the occasion of a condemnation of the Chevalier de la Barre read from the pulpit at Easter Sunday mass. François-Jean le Febvre de la Barre had been tortured and executed for blasphemy at the age of nineteen in the Picard city of Abbeville, a case that drew the crusading attention of Voltaire and various other *philosophes* (including Condorcet)[9] as a flagrant example of injustice and brutality fuelled by religious fanaticism. The letter defends the current century against the bishop's charges of decline:

> You say Monseigneur that our century is frivolous. Is it not true that mathematics, chemistry, natural history are cultivated in France as never before and that the study of the profane sciences has never been so widespread among fashionable folk? It is true that women who in other times read nothing but novels and their breviaries now read Montesquieu and Rousseau, that men who travelled in former times only on pilgrimages are now going to educate themselves throughout all of Europe. What frivolity. Our savants occupy themselves in learning about the number of kinds of earths, of which fluids the air we

[8] M. J. A. N. Condorcet, *Esquisse d'un tableau historique de progrès de l'esprit humain*, ed. O. H. Prior, édition présentée par Yvon Belaval (Paris, 1970), p. 192.

[9] As in, for example, an April 1775 letter from Condorcet to M. Target, 'avocat au Parlement', pleading for a retrial of La Barre in order to clear his name and the honour of France: F. Arago and A. Condorcet-O'Connor (eds.), *Oeuvres de Condorcet* (Paris, 1847–9), 1. 292.

> breathe is composed. We are busy with canals, with machines that carry water to cities, agricultural experiments . . . poor century.[10]

The increase of knowledge and industry described here is the primary sense of *lumières*: more people know ever more about more things. This knowledge pertains not only to scientific and technical but also moral and political matters—everything that is necessary 'for the common use of life' for all men and women.[11] Convinced by the example of his own country and century that *lumières* 'constantly increased' from generation to generation,[12] Condorcet reversed not only the ancient trope of time as amnesia and decay, but also the fear of some *philosophes* that an outbreak of warfare or plague could once again engulf Europe in a new Dark Ages. For Condorcet, truth was indeed revealed by time.

For Condorcet and many of his fellow *philosophes*, the steady spread of *lumières* had a moral as well as an intellectual component. The truth will not only make us free, but virtuous as well—and by means of the same unmasking gesture. In contrast to seventeenth-century accounts of obstacles to the discovery of truth, which indicted human infirmity (dim senses, weak intellects, imperfect language, false theories), the eighteenth-century culprit is considerably more sinister: outright fraud, perpetrated by the powerful and cunning few upon the many in the form of prejudices instilled by upbringing. Condorcet's category of 'prejudice' is a capacious one, including religious bigotry, erroneous opinions in the moral and physical sciences, and various forms of injustice, such as the use of torture to extract confessions. But not every error qualifies as a prejudice in Condorcet's book. Prejudices are not just false beliefs; they are false beliefs instilled by authority and supinely, stubbornly, even slavishly held. Prejudices are *culpable* false beliefs, originating in deception and perpetuated by timidity and sloth, and hence a matter for moral reproach as well as intellectual regret.

Condorcet's psychology of belief was entirely passive, in stark contrast to active reason. The ghost of the scholastic opposition between (and asymmetric evaluation of) activity and passivity haunts Enlightenment

[10] 'Lettre d'un gentilhomme Picard à l'Evêque d'Amiens', Bibliothèque de l'Institut, Paris, Manuscrit Condorcet 857, ff. 1–13.

[11] M. J. A. N. Condorcet, *Vie de Turgot* [1786], in Arago and Condorcet-O'Connor (eds.), *Oeuvres de Condorcet*, 5. 204.

[12] M. J. A. N. Condorcet, 'Première mémoire: nature et objet de l'instruction publique', in Condorcet, *Cinq mémoires sur l'instruction publique*, ed. Charles Coutel and Catherine Kintzler (Paris, 1989), p. 61.

sensationalist psychology and Condorcet's morality of *lumières*. On this account, beliefs etch themselves into consciousness the way water wears down rock. Repetition of impressions at either first- or second-hand gradually cements belief; more vivid impressions, amplified by sensibility and passion, accelerate the process. In some cases, the tendency to believe on the basis of repetition is wholly reasonable, because the repetition depends on the uniformity of nature: we believe that the sun will rise tomorrow because it has repeatedly done so since time immemorial. But in other cases, it is textbooks and catechisms that drum in beliefs, often substituting intensity (the schoolmaster's rod or the church's ornament) for the frequency of impressions.[13] The imagination also conspires in this passivity, retreating to an inner world of pleasing fantasies and (in the case of savants) seductive systems. These mechanisms were so effective that prejudices imbibed in youth could rarely be rooted out in adulthood. Even in science, Condorcet claimed, geniuses who proclaim new ideas seldom win advocates except among 'their equals and some young people raised far from the prejudices of the public schools'.[14]

The only antidote to the automatism of belief was the exercise of active reason, which demanded both the courage to defy authority and the sagacity to sift, select, and above all analyse impressions. By practising a Lockean analysis upon our acquired ideas and beliefs, we will, so Condorcet hoped, be able to weed out those prejudices unsupported by evidence.[15] In contrast to later, nineteenth-century epistemological ideals that exhorted scientists to self-restraint, on the motto 'Let Nature speak for herself', eighteenth-century savants intervened resolutely to order and prune the data of experience. This was not so much a distinction between passive observation versus active experiment (which was of nineteenth-century coinage), as one between passive receptivity to and active organisation of experience. Condorcet admired the artificial classification system of Linnaeus, although he recognised that it deliberately excluded a great deal of observational detail about plants in order to focus on a few key characteristics that defined the species.[16] More generally, Condorcet was an enthusiast for tables that revealed the entire state of a science at a glance, the new analytical language of chemistry that decomposed

[13] Condorcet, *Essai*, pp. x–xiv, cxc–cxci.
[14] M. J. A. N. Condorcet, 'Eloge de Mariotte', in *Eloges des académiciens de l'Académie Royale des Sciences morts depuis 1666, jusqu'en 1699* (Paris, Hôtel de Thou, 1773), p. 52.
[15] Condorcet, *Esquisse*, p. 157.
[16] Keith Michael Baker, 'An Unpublished Essay by Condorcet on Technical Methods of Classification', *Annals of Science*, 18 (1962), 99–123, at p. 101.

compounds into elements on the page, and (as we will see in the next section) algebraic calculations that were the formal prototype for all analysis and combination of ideas.[17] These were the concrete practices of abstract reason in the Enlightenment.

Just as the passive harbouring of prejudices was at once a cognitive and moral failing, so the active flexing of reason to scrutinise belief and organise experience was praiseworthy on both counts. Condorcet's curious conviction that *lumières* entailed virtue as well as knowledge, that the Good followed in the wake of the True, requires some explanation for those persuaded by the history of science and technology in the intervening centuries between his day and ours that there is alas no necessary correlation between scientific and moral progress. What *lumières* made possible, according to Condorcet, was independence: the *homme éclairé* knew his rights before the law, enough mathematics and science not to be duped by charlatans or terrified by priests, and the difference between fact and opinion. The telos of human perfection envisioned in the Tenth Epoch of the *Sketch of a Historical Picture of the Human Mind* would be reached when 'all will have the *lumières* necessary to conduct themselves according to their own reason.'[18] This hope echoes Kant's definition of Enlightenment as emergence from 'self-imposed tutelage', although it is unlikely that Condorcet knew Kant's essay and still more unlikely that he would have approved of the restrictions Kant recommended to be imposed upon the public exercise of reason. Moreover, Condorcet did not consider reason alone sufficient for autonomy; reason must be supplemented by *lumières*.

The kind of life made possible by independence is a recurring theme in Condorcet's writings, which hint at an exemplary vita that is neither saintly nor Stoic, neither military nor political, but nonetheless virtuous and heroic.[19] That independence is desirable for the individual perhaps requires no further explanation, but it is noteworthy just *how* desirable it was felt to be by Enlightenment thinkers who otherwise diverged sharply in their political and social views. Condorcet would never have subscribed to the prayer Rousseau offers up in the *Discourse on the Sciences and Arts* (1750): 'Almighty God, thou who holds all spirits in thy hands, deliver us from the enlightenment and fatal arts of our forefathers, and give back to

[17] Condorcet, *Esquisse*, pp. 233, 180, 174.
[18] Ibid., pp. 204–5.
[19] See the excellent discussion of these themes in Emma Rothschild, *Economic Sentiments: Adam Smith, Condorcet, and the Enlightenment* (Cambridge, MA, 2001), especially pp. 201–2.

us ignorance, innocence, and poverty, the only goods that can give us happiness and are precious in thy sight.'[20] Yet he might well have assented to the passages in which Rousseau railed against the way in which civility and emulation in the arts and sciences placed people under the 'perpetual constraint' of cultivating the good opinion of others: 'Incessantly politeness requires, propriety demands; incessantly usage is followed, never one's own inclinations.'[21] Even the debauched title character of Diderot's dialogue *Rameau's Nephew* cannot bring himself to grovel in front of his wealthy, boorish patrons in order to be taken back as a pampered pet, although his own cynical principles would dictate a return to well-fed dependence on even the most humiliating terms: 'I feel something here [putting his right hand on his heart] which swells in pride and says to me, "Rameau, you'll do no such thing". A certain dignity attaches to the nature of man that nothing must destroy.'[22] Condorcet himself defended Voltaire's wealth, so unbefitting a philosopher according to the standards of the ancient sages, as a guarantee of independence: 'Let us then not blame a philosopher for having preferred, in order to assure his independence, the resources that the customs of our century presented him to those which suited other customs in other times.'[23]

But what made independence not just desirable, but virtuous? The answer must be framed largely in negative terms, as a reply to the converse question: what made dependence vicious? Condorcet assumed that dependence, whether financial or intellectual, inevitably corrupts both parties to the relationship. Slavery renders the slave devious and the master brutal; ignorance renders the peasant superstitious and the priest deceptive; tyranny renders the subject timorous and the despot cruel; patronage renders the client servile and the patron vain. Condorcet's opposition to dependence was principled as well as pragmatic: judged by the standards of natural rights, such relationships were profoundly unnatural, however entrenched in custom—as in the oppression of women by men, children by fathers, the poor by the rich.[24]

[20] Jean-Jacques Rousseau, *Discourse on the Sciences and Arts* [*The First Discourse*, 1750] in Jean-Jacques Rousseau, *The First and Second Discourses*, ed. Roger D. Masters, trans. Roger D. and Judith R. Masters (New York, 1964), p. 62.
[21] Rousseau, *Discourse on the Sciences and Arts*, p. 38.
[22] Denis Diderot, *Le Neveu de Rameau* [comp. *c*.1762], in Diderot, *Rameau's Nephew and Other Works*, trans. by Jacques Barzun and Ralph H. Bowen (New York, 1956), p. 21.
[23] M. J. A. N. Condorcet, *La Vie de Voltaire*, in *Oeuvres complètes de Voltaire* (Paris, 1831), 1. 30.
[24] Condorcet, *Vie de Turgot*, pp. 195–6.

The normative force of nature is mighty in Condorcet's thought, and it derives primarily from nature's uniformity and universality. He was scandalised by Montesquieu's defence of local custom over uniform criminal, civil, and commercial laws: 'Just as truth, reason, justice, the rights of man, the interests of property, of liberty, of security are the same everywhere . . . A good law must be good for all people, as a proposition is true for all.'[25] In the same breath he defended a uniform system of weights and measures, preferably one based on a unit set by nature itself.[26] It would be easy, too easy, to dismiss Condorcet's appeals to the moral, legal, and political authority of nature as yet another commission of the naturalistic fallacy, a misguided attempt to derive 'ought' from 'is'. For Condorcet, uniform and universal nature underwrote all expressions of uniformity and universality—including not only the generalisations of mathematics but also the verdicts of justice. As such, nature served as a bulwark against all that was arbitrary, all that was blindly habitual in human affairs, against the caprices of the tyrant and the prejudices sanctioned by custom.

A law based upon natural rights was *ipso facto* one rooted in reason, and therefore transparent to all citizens, not just to the guild of lawyers who profited from complexity and obscurity. Moreover, the power of generalisations derived from uniform and universal natural rights could be breathtaking, because so contrary to accepted norms and venerable institutions. Relentless in his consistency, Condorcet turned uniformity and universality to utopian ends, using them to extrapolate to a future in which slavery would be abolished, public education would be available to all, life expectancy would double, and women would be the legal and political equals of men: 'But woman is also a sensitive being, capable of reasoning and of acquiring moral ideas: the natural rights of man therefore do not exist—there are none which woman should not share.'[27] Since the mid-nineteenth century, the authority of nature has usually been invoked by political conservatives, as the reason why reform is futile, because the current order is the necessary order: a position evoked by

[25] M. J. A. N. Condorcet, 'Observations de Condorcet sur le vingt-neuvième livre *De l'Esprit des lois*', in Antoine Louis Claude Destutt de Tracy, *Commentaire sur l'Esprit des lois de Montesquieu* (Paris, 1828), pp. 330–8. Book 29 of *De l'Esprit des lois* is entitled 'De la manière de composer les lois'.

[26] Condorcet, 'Observations', p. 380; cf. Condorcet, *Vie de Turgot*, p. 71, and [Borda, Lagrange, Laplace, Monge, and Condorcet], 'Rapport fait à l'Académie royale des sciences sur le choix d'une unité de mesures', *Histoire de l'Académie royale des sciences 1778* (Paris, Imprimerie Royale, 1781), pp. 7–16.

[27] M. J. A. N. Condorcet, 'De l'influence de la révolution en Amerique', Bibliothèque de l'Institut, Paris, Manuscrit Condorcet 857, f. 562v.

phrases such as 'anatomy is destiny', 'the struggle for existence', or, more recently, 'it's genetically hard-wired'. For Condorcet and his contemporaries, however, nature was on the side of the reformers and the radicals, a standing reproach to the social status quo. Nature had enlisted in the cause of *lumières*.

III. Calculation

For Condorcet, *lumières* as knowledge, as virtue, as world view stood four-square opposed to inert, submissive habit—with one notable exception, the habit of calculation. Perhaps no other word divides the friends and foes of the Enlightenment so sharply and so vehemently as 'calculation'. For those who reject the Enlightenment and all its works, 'calculation' conjures up the hypertrophy of head at the expense of heart, Sainte-Beuve's 'monstrous brain', an inexorable machine indifferent to human fate and foibles. In the course of the nineteenth century, calculation became further tarred with associations with the brutish as well as with the brutal. Massive calculations needed to compile logarithm tables or reduce astronomical data were performed first by low-paid workers (often women) and then by machines. Calculation came to be seen at best as soul-numbing, a kind of labour better delegated to machines, and at worst as soul-destroying, the mark of someone who knows all about the rationality of means and none about that of ends. Condorcet's enchantment with calculation can only strike these critics as confirmation of their worst fears about the icy inhumanity of the Enlightenment. Yet Condorcet's notion of calculation as both theory and practice was embedded in an entirely different field of associations, one that linked it to intelligence and *lumières* rather than to machines and heartlessness.

Calculation in the Enlightenment had not yet become mechanical, the paradigmatic example of processes that were mental but not intelligent. The 1778 edition of the *Dictionnaire de l'Académie Française* gave the following illustrative sentence for the word *calculateur*: 'This astronomer is a great and good calculator.'[28] Calculation was still the distinctive activity of the scientist or mathematician, not the anonymous drudge. Until the early nineteenth century, prodigious feats of mental reckoning were a topos in the eulogies for great mathematicians, Carl Friedrich Gauss's

[28] 'Calculateur, s. m.', *Dictionnaire de l'Académie Française*, 2 vols. (Nîmes, Pierre Beaume, 1778), 1. 162.

lightning arithmetic being perhaps the last of these stock legends. When the great French mathematician Pierre-Simon Laplace, Condorcet's colleague at the Académie Royale des Sciences and one-time protégé, described probability theory as 'good sense reduced to a calculus', he intended to disparage neither good sense nor probability by the comparison.[29] Indeed, intelligence itself was conceived as essentially a form of calculation.

Eighteenth-century usage of the term *intelligence* overlaps but does not coincide with its current meaning. Both denote mental agility, particularly in problem solving and learning. But the questions that now tax us about intelligence—inborn or acquired through education? the property of individuals or groups? unitary or multiple in its faculties?—could not have been easily accommodated within the Enlightenment framework for understanding the workings of the human mind. Rather, the sensationalist inquiries into the mind pursued by Locke and his successors posed questions about the origins and limits of human knowledge, straddling the boundary that now separates psychology from epistemology and which eighteenth-century philosophers (just to make the terminological confusion complete) often called 'metaphysics'. The sensationalist project, which Condorcet wholeheartedly endorsed as a cure for prejudice, was at once explanatory and therapeutic: to reveal how we came by our ideas was simultaneously to test their soundness. Etienne Bonnot de Condillac, whose version of Lockean sensationalism influenced many of the *philosophes*, described this investigation into the origins and validity of ideas as the method of 'analysis', which consisted 'only in composing and decomposing our ideas, in order to compare them differently, and to discover the relations they have among themselves, together with the new ideas they are capable of producing'.[30] Genius itself was nothing more than a mind more penetrating in analysis, more fertile in combinations.[31]

For Condorcet, analysis was simultaneously a method for investigating the mind's operations and a description of those operations. The healthy mind, unperturbed by passions or an unruly imagination, was endlessly taking apart its ideas and sensations into their minimal elements, then comparing and rearranging these elements into novel permu-

[29] Pierre-Simon Laplace, *Essai philosophique sur les probabilités*, 3rd edn. [1820], in Laplace, *Oeuvres complètes*, 14 vols. (Paris, 1886), 7. cliii.
[30] Etienne Bonnot de Condillac, *Essai sur l'origine des connoissances humaines*, 2 vols. in 1 (Amsterdam, 1746), 1. 101–2.
[31] Condillac, *Essai*, 1. 104.

tations and combinations. Condorcet could wax rhapsodic over this method of Lockean analysis, a 'universal instrument' as applicable to morals, politics, economics, and the rules of good taste as it was to the physical sciences. It discovered new truths, certified their degree of certainty, and erected 'an eternal barrier between the human species and the old errors of its childhood'.[32] His manuscripts contain many fragmentary plans for universal languages,[33] universal classification systems,[34] including even universal systems of legal contracts,[35] all based on the calculation of combinations and permutations.

This all sounds like the monomania of the mathematician. But Condorcet was quite capable of rejecting the results of calculation when they conflicted with 'common reason' or seemed insufficiently grounded in observation.[36] Clarity must not be sacrificed to rigour, as he reprimanded a political economist who had tried to quantify the desire to buy and sell.[37] More generally, he drew a distinction between mathematical calculation as a problem-solving tool and as a study 'suitable for forming reason, for strengthening it'.[38] Calculation was much more than a tool, much more even than a philosophical method for Condorcet; it might be described, borrowing a term from the historian of ancient philosophy Pierre Hadot, as a 'spiritual exercise',[39] repeated routines of the mind designed to strengthen and shape the soul as athletic exercises strengthened and shaped the body: 'Generally, they consist, above all, of self-control and meditation. Self-control is fundamentally being attentive to oneself: an unrelaxing vigilance for the Stoics; the renunciation of unnecessary desires for the Epicureans.'[40] The meditations of Marcus Aurelius

[32] Condorcet, *Esquisse*, pp. 156–7.
[33] Ibid., p. 174.
[34] Baker, 'An Unpublished Essay', p. 104.
[35] See the manuscript report, dated 30 April 1785, concerning a proposed prize to be offered by the Académie Royale des Sciences, Archives de l'Académie des Sciences, Paris, Dossier Condorcet.
[36] See for example M. J. A. N. Condorcet, 'Mémoire sur le calcul des probabilités: Quatrième partie. Réflexions sur la méthode de déterminer la probabilité des événemens futurs, d'après l'observation des événemens passés', *Mémoires de l'Académie royale des sciences 1783* (Paris, Imprimerie Royale, 1786), pp. 539–53, at p. 553; also Condorcet, *Essai*, p. lxxv.
[37] Condorcet to the Count Pierre Verri (7 Nov. 1771), in Arago and Condorcet-O'Connor (eds.), *Oeuvres de Condorcet*, 1. 283–7.
[38] Condorcet, *Vie de Turgot*, pp. 159–60.
[39] Pierre Hadot, *La Philosophie comme manière de vivre*. Entretiens avec Jeanne Carlier et Arnold I. Davidson (Paris, 2001), pp. 159–91.
[40] Pierre Hadot, 'Forms of Life and Forms of Discourse in Ancient Philosophy', in his *Philosophy as a Way of Life*, ed. Arnold I. Davidson, trans. Michael Chase (Oxford, 1995), pp. 49–70, on p. 59.

train the imagination to dwell upon scenes of human insignificance (the forgotten rulers of past epochs, the processes of decay already at work even among the living), much as Seneca took a cosmic perspective to shrink the entire planet earth to a pinpoint. What calculation taught its practitioners was, however, not the vanity of human ambitions, but what Condorcet called the 'exactitude of the mind [*justesse d'esprit*]'.

Like *lumières*, exactitude of mind was an attainment that combined intellectual, moral, and even aesthetic dimensions. In a textbook on arithmetic and geometry written for the public elementary schools he hoped that the revolutionary National Assembly would make universal, Condorcet used the simplest arithmetic identities—'three plus four equals seven'—to teach children the meaning of self-evidence and justified belief: 'From this, they will learn that the distinct memory of having had the perception of the identity of the two ideas that form a proposition, that is to say the self-evidence of this proposition, is the only motive they have to believe it . . . and that the memory of merely having always repeated or written this proposition, without having felt its self-evidence, is not a motive to believe.'[41] In this fashion, simply by practising the simplest arithmetic operations over and over again, children would learn about 'the three intellectual operations of which our mind is capable; *the formation of ideas, judgment, reasoning*'. The instructor must take care to choose examples that will show pupils that it is 'useful or pleasant' to perform calculations and to exercise them on so many particular examples that they would thereby become convinced of the 'exactitude' of the general method underlying the operations.[42] Elsewhere, in a lecture on adult education, Condorcet insisted that the teacher of mathematics should be less of a 'master than a guide', for reason could not be instilled by authority.[43]

Yet as in the case of all spiritual exercises, calculation was a regimen that demanded regular repetition if it was to mould the mind of the initiate. Calculation must become habitual, but not routinised, if it was to have this transformative effect. Hence the dangers of algebraic or logical formulas, which spared the mind a painstaking effort of attention, but at the price of letting the intellect go slack and sharp-edged ideas become

[41] M. J. A. N. Condorcet, *Élémens d'arithmétique et de géométrie* [1804], *Enfance* 4 (1989), 40–58, on 44.
[42] Condorcet, *Élémens*, pp. 45, 46, 56–7.
[43] M. J. A. N. Condorcet, *Discours sur les sciences mathématiques prononcé au Lycée le 15 février 1786* (Paris, 1812), p. 24.

blurry: 'One leaves the natural forces without exercise; one loses first their use, then the forces themselves.' The numbers from one to ten must never be memorised, but instead taught 'by intelligence and by reason; nothing is abandoned to routine'.[44] Children must be given small numbers with which to compute at first, so that the facility acquired by habit 'never separates itself from comprehension of the principles'.[45] Whenever these elements are manipulated in calculation, the mind must form anew a clear idea of their meaning as collections of units. In this way, Condorcet hoped, habit would not lead to mindless automatism.

Calculation had moral as well as intellectual resonances for Enlightenment philosophers. In a justly famous essay, Albert Hirschman documented the striking process by which the prudent and selfish interests were promoted first to lesser vices and then to lesser virtues in the writings of early modern moralists. By means of interests like greed, the still more dangerous passions like lust and ambition might be tamed.[46] Key to the moral re-evaluation of the interests was the belief that they involved self-disciplined as well as self-interested calculations and therefore resulted in reassuringly calculable conduct. Avarice might not be noble, but it was at least predictable and therefore reinforced the orderliness of the social order. In Samuel Johnson's novel *Rasselas*, for example, Lady Pekuah is relieved to discover that her Arab abductor loves gold, for 'avarice is a uniform and tractable vice: . . . bring money and nothing is denied.'[47] Condorcet, who laid great store by the moral sentiments of pity and sympathy, was not so tough-minded as Lady Pekuah, but he did assert that calculation could on occasion reinforce compassion.[48]

Yet if calculation simply confirms, as Condorcet never tired of repeating, the conclusions of reason and compassion, why calculate? The answer to this question goes to the heart of Condorcet's conception of *lumières* as a kind of inner illumination of the individual as well as outer enlightenment of society. 'Exactitude of the mind' demanded more than

[44] M. J. A. N. Condorcet, *Moyens d'apprendre à compter surement et avec facilité* (Paris, 1804), *Enfance* 4 (1989), 59–90, at 61–2.

[45] M. J. A. N. Condorcet, 'Seconde Mémoire. De l'instruction commune pour les enfants', in Condorcet, *Cinq mémoires sur l'instruction publique*, ed. Coutel and Kintzler, p. 97.

[46] Albert O, Hirschman, *The Passions and the Interests: Political Arguments for Capitalism before Its Triumph* (Princeton, 1977).

[47] Samuel Johnson, *The History of Rasselas, Prince of Abissinia* [1768], ed. J. P. Hardy (London, 1968), p. 93.

[48] M. J. A. N. Condorcet, 'Discours sur l'astronomie et le calcul des probabilités, lu au Lycée en 1787', in Arago and Condorcet-O'Connor (eds.), *Oeuvres de Condorcet*, 1. 482–503, at 502.

knowledge and reason, for knowledge and reason alone were too vague to solve many complex problems, particularly in the realm of politics, economics, and society. Writing on the optimal organisation of the judiciary, Condorcet acknowledged that unaided reason would lead to the conclusion that the greater the plurality of jurors required to condemn a defendant in a criminal case, the smaller the risk of subjecting an innocent person to torture or execution.[49] Naked reason could not, however, determine how large a plurality is necessary, no more than the naked eye could resolve the Milky Way into individual stars. Calculation was to reason what the telescope was to the eye. But the benefits of calculation extended beyond the instrumental for Condorcet. Only calculation, practised faithfully and mindfully, could create justified certainty, as opposed to the spurious certainty generated by mere reiteration of impressions. This effect is as much psychological as it is epistemological, simultaneously conviction and self-evidence. Calculation as a way of life steadied as well as clarified; it gave the timorous courage and rescued the sceptical from indifference. This is why habitual calculation displayed 'the price of *lumières*'.[50] Condorcet's own manuscripts are strewn with calculations, which for him were anything but cold and mechanical.

IV. Fear

Condorcet was hardly original in regarding fear as the most unphilosophical of the passions,[51] but he was unusual in enlisting calculation to fight it, and on two fronts: the practices of everyday life and the precepts of the life of the mind. In both cases, he paradoxically had recourse to probabilism in order to overcome paralysing uncertainty—or rather to calculated probabilities. Condorcet once defined the mathematical theory of probability as 'the art of conducting oneself in a certain manner in events subject to uncertainty'.[52] Dangers that had loomed large and dark, doubts that had gnawed silently and relentlessly were converted into quantified risks, and thereby psychologically shrunk. Once again, 'exactitude of ideas' served as a weapon, but this time sharpening the focus was not a means to an end, as it had been in Condorcet's computation of the

[49] Condorcet, *Essai*, p. v; cf. p. clxxxv.
[50] Ibid., p. clxxxvi.
[51] Rothschild, *Economic Sentiments*, pp. 12–14.
[52] Condorcet, *Discours sur les sciences mathématiques*, p. 18.

minimum plurality required to guarantee a fair jury trial, but an end in itself. Fear fed on the indistinct and the undefined; what could be more matter-of-factly distinct and defined than numbers?

Condorcet's projects for applying probability theory to everything from the design of tribunals to testing the efficacy of medical therapies to weighing the reliability of historical evidence are too numerous to review here. Instead, I shall restrict myself to two examples that were expressly designed to promote action by suppressing fear: the computation of the risks of commerce and of scientific generalisations. In the case of the former, Condorcet was concerned to encourage over-cautious merchants to invest in more venturesome undertakings. He drew a sharp distinction between the involuntary risks incurred in commerce as opposed to the voluntary risks incurred in gambling. No 'reasonable man' would indulge in cards or the lottery if his honour and family fortune were at stake; yet that is exactly what commerce demands of the merchant. Hence the merchant must be assured of two probabilities: first, of a 'sufficient' probability that losses will not drive him out of business; and second, of a 'very large and continually increasing probability' that his profits will repay his trouble the longer he persists in his enterprise. Condorcet believed that both probabilities could be ascertained for various trades by consulting the registers of maritime insurance companies.[53] For my purposes, what is noteworthy here is that the merchant is supposed to overcome his timidity neither by swashbuckling boldness or stoic indifference, but instead by a careful comparison made possible by the quantification of risk.

The dangers of trade on the high seas are easier to make vivid than doubts about the validity of scientific theories. Yet the latter were strong and consequential among mid-eighteenth century savants. The origins of modern philosophy, one might argue the origins of modern Western thought *tout court*, lie in a seventeenth-century diagnosis of pathological belief. The beliefs in question ranged from the theological to the astronomical to the geographical, from the anatomical to the natural philosophical: the voyages of discovery, the Reformation, the triumph of Copernican astronomy and Newtonian natural philosophy, the demonstration of the circulation of the blood—all confronted early modern

[53] M. J. A. N. Condorcet, 'Théorie mathématique des assurances', Bibliothèque de l'Institut, Paris, Manuscrit Condorcet 857, ff. 202–6. Condorcet's assumption that insurance companies kept such records may have been over sanguine; at least, it was rare for maritime insurance premiums to be set on the basis of statistics in the eighteenth century. Moreover, gambling and insurance were regularly conflated, both in legal theory and financial practice: Daston, *Classical Probability*, pp. 167–9.

thinkers with dramatic and disturbing examples of errors that had persisted for centuries on the authority of the very best minds. It is difficult to capture the enormity of this revelation of pervasive and enduring error for those who had been educated largely in the old systems of thought—the sickening realisation that so many respected authorities could have been so wrong for so long. Some of the most famous projects of the Enlightenment, such as the *Encyclopédie* of Denis Diderot and Jean d'Alembert, germinated in this overwhelming awareness of having only recently emerged from over a millennium of collective intellectual error: one of the avowed aims of the *Encyclopédie* was to serve as a kind of time capsule to preserve the new discoveries, should war and pestilence plunge Europe once again into darkness.

The search for an explanation and thereby an antidote to future intellectual disasters centred on the problem of excessive belief. This was regarded as an emotional, ethical, and even medical, as well as an intellectual malady, and one with potentially devastating consequences. Much blood as well as ink had been spilt in early modern religious controversies, and throughout the late seventeenth and eighteenth centuries 'enthusiasm' and 'superstition' were reviled as sources of ecclesiastical and civil unrest. Excessive belief stemmed from psychological and corporeal causes, both of which had to be strictly managed in the susceptible: too great an appetite for the wondrous (asserted to afflict the vulgar and unlettered), a too soft and therefore impressionable brain (as allegedly found in women and children), or too much black bile (the temperament of melancholics) might all cause credulity. The fact that excessive belief was understood at least partly in medical terms by no means exonerated sufferers from the moral responsibility of restraint; spiritual and bodily regimens must be rigorously followed in order to rein in such dangerous inclinations. Among philosophers, the responsibility was intellectual as well as ethical, e.g. Descartes' instructions to take inventory of all one's stock of beliefs and discard those with the least blemish of uncertainty, or Locke's insistence that belief be apportioned to evidence. These religious, philosophical, and theological programmes for disciplining belief not only raised the threshold of the credible; they also changed the nature of belief itself. Whereas belief had previously been conceived as an involuntary state and, in religious contexts, as a divine gift, by the late seventeenth century it had become a matter of voluntary assent, the 'will to believe'—or to disbelieve, had become possible.

The shock of the seventeenth-century encounter with past error left a lasting mark on philosophy, and, to a lesser extent, on science. Until

the mid-seventeenth century, intellectuals in Latin Europe had generally worried about incredulity rather than credulity, about believing too little rather than too much. The avalanche of novelties—new flora and fauna, new continents, new planets, new peoples, new inventions, new religions, new sciences—that deluged early modern Europeans had initially worked to reinforce the prejudice against incredulity; it was a mark of provincialism and little learning to doubt reports of armadillos, Chinese paper money, or microscopic animals in a drop of water. But by the early eighteenth century, the pendulum had swung to the opposite extreme—to the point that scientific academies refused to credit reports of meteor showers as smacking of the prodigious—and stayed there. The insistence that belief be 'warranted' became and remains a philosophical dogma; according to the doctrine of warranted belief, the fact that a belief is true is by itself insufficient grounds for holding it without further explicit, reasoned justification. The emphasis upon warranted belief led to the spectacular rise of epistemology and the equally spectacular decline of metaphysics since the late seventeenth century.

Condorcet participated fully in this turn towards epistemology; he was well nigh obsessed with ascertaining the relationship between evidence and what he called the 'motive to believe [*motif de croire*]'. Yet he was also aware of excesses in the other direction, of excessive incredulity (the pathology of the learned) as well as of excessive credulity (the pathology of the ignorant). Both extremes were fuelled by fear, the epistemological fear of error in the one case and the superstitious fear of retribution in the other, and both led to paralysis, the inability to act. How to translate the 'motive to believe' into the 'motive to act'? Once again, Condorcet hoped that the calculation of probabilities would overcome scruples and caution. Inspired by the mathematical theorem of inverse probabilities independently proven by Thomas Bayes and Laplace, Condorcet set about calculating how many confirming observations were needed to guarantee what probability that putative cause and effect were necessarily rather than coincidentally conjoined in a natural law.[54] Even though certainty could never be obtained, doubts could be vanquished; modern natural philosophers need not succumb to the pyrrhonism and *ataraxia* of the ancients, to 'discouragement and indolence'. By determining the probabilities upon which our knowledge is based with 'a kind of exactitude', we will be able, Condorcet promised, to 'judge and conduct ourselves, no

[54] Condorcet, 'Mémoire sur le calcul des probabilités: Quatrième partie'; Daston, *Classical Probability*, pp. 253–84.

longer according to a vague and mechanical impression, but according to an impression subjected to calculation, whose relationship to other impressions of the same sort is known to us'.[55] We will have a motive to act in the world with confidence and conviction.

V. Enlightenment, enlightenment, and 0.999993

This promise returns us to the probability 0.999993, which Condorcet computed as the minimum probability a citizen in a just society must be guaranteed of not being falsely convicted of a crime. By itself, the figure is inert; it must be brought into relationship with other risks, also calculated so that they can be compared with one another. Ideally, Condorcet had wanted to use a risk small enough that anyone would take it without a second thought—e.g., taking the packet boat from Dover to Calais in calm weather on a seaworthy boat manned by a competent crew. Unfortunately, reliable statistics were not available for packet boat runs, so Condorcet turned to the one area where statistics had been gathered for almost a century, human mortality. He reckoned that the difference between dying in the next week between two closely spaced ages (say, age thirty-nine and forty) was comparably minute: that is where the fraction 144,767/144,768 (= 0.999993) comes from. Condorcet insisted that this must be a risk taken voluntarily and with eyes wide open, not a risk usually neglected because it is 'habitual and inevitable'.[56] The exercise also assumes that people be consistent about their risk-taking, always preferring a smaller to a larger risk and acting with equal nonchalance on equally small risks—an assumption that is anything but self-evident, as an enormous body of current psychological research on actual risk preferences (e.g. for automobile over airplane travel) demonstrates.

Condorcet was often and, in the end, tragically over-optimistic about human rationality, although he was not naïve about the psychological and political forces that subverted it and how the two worked hand-in-hand: uncertainty bred terror, which in turn bred subservience.[57] Uncertainty could never be overcome—like Locke, Condorcet believed we dwell in the twilight of probabilities—but it could be tamed: calcu-

[55] Condorcet, *Essai*, p. xciii.
[56] Ibid., pp. cvii–cxiv.
[57] M. J. A. N. Condorcet, 'Conseils d'un zélé républicain', Bibliothèque de l'Institut, Paris, at f. 362r, Manuscrit Condorcet 857, ff. 385–97.

lated, compared, faced up to with hope and consistency. There was nothing technocratic about Condorcet's vision of a future society based on science and technology:[58] all citizens, men and women, black and white, would be educated and politically enfranchised; all would be enlightened. That is what consistency demanded. Some of Condorcet's most daring predictions in his final philosophical testament—the remarkable increase in agricultural yields that would stave off starvation, the steady rise in human life expectancy, the spread of literacy and education—may also be seen as exercises in consistency, hopeful extrapolations of trends already underway. In this sense, his account of the progress of the human mind is very much history written by a mathematician, past, present, and future arranged in a convergent series.

But Condorcet's penchant for mathematics has been largely misunderstood, splintering his thought for post-Romantic readers who find him a jumble of contradictions: cold calculation and warm sentiment, technocrat and democrat, calm rationalist and fiery crusader, probabilist and dogmatist. Some, though not all, of these oppositions dissolve when Condorcet's well-known Enlightenment positions are infused with his forgotten enlightenment ethos. Calculation for Condorcet was not the grinding of machinery; it was a battering ram against fear and prejudice. Consistency for Condorcet was not the hobgoblin of little minds; it was a springboard into the future. Uniformity and universality did not bore Condorcet; exact minds delighted in them. The psychological colouring of these terms was essential for the progress of *lumières*: Condorcet, like Kant, was fully aware that reason alone was insufficient to bestir the will. When he wrote of the 'motive to believe' and the 'motive to act', the word 'motive'—not 'reason'—had been chosen advisedly. Enlightenment writ large was built upon enlightenment writ small.

In his capacity as Perpetual Secretary of the Académie Royale des Sciences, Condorcet was charged to write eulogies for deceased academicians, continuing the ancient genre, stretching back to Diogenes Laertius, of the lives and works of the philosophers. The eulogies reported on the character and manner of life, as well as the scientific contributions of the academicians, echoing the classical models eighteenth-century schoolboys had all read. Condorcet himself likened his own death to that of Socrates, a philosopher's death: 'I will perish like Socrates and Sidney for

[58] Condorcet, *Essai*, pp. 148–9.

having served [the liberty of my country] . . .'.[59] But in word and in deed, Condorcet had in fact exemplified a very different kind of philosophical vita. He had foresaken the *vita contemplativa* of the savant for the *vita activa* of the engaged intellectual—or rather, he had harnessed the *vita contemplativa* to the ends of the *vita activa*, mathematics in the service of social reform and individual renewal. Instead of defining independence as freedom from family ties,[60] he had viewed domestic life as the foundation of all virtues and political liberty as well.[61] And although his dramatic death was precisely the stuff of legend, a classical scene to be set down in a eulogy to gild Condorcet's own glory, he had already imagined a different kind of immortality for the disciples of *lumières*:

> If the indefinite perfectibility of our species is, as I believe, a general law of nature, man must no longer regard himself as a being limited to a passing and isolated existence, destined to vanish after an alternation of happiness and misfortune for himself. . .; he becomes an active part of the grand whole and a collaborator in an eternal work. In an existence of a moment at a point in space, he can, by his works, embrace all places, connect himself to all centuries, and still act long after his memory has disappeared from the earth.[62]

That was enlightenment, the enlightened sublime.

[59] Charles Coutel (ed.), *Politique de Condorcet* (Paris, 1996), p. 281. Algernon Sidney (1622–83), second son of the Earl of Leicester, famously defended the rights of parliament against executive oppression under both Cromwell and Charles II; he was executed for treason.

[60] Condorcet had rehearsed these traditional arguments against marriage in his 'Eloge de M. Du Hamel', *Histoire et mémoires de l'Académie royale des sciences. 1783* (Paris: Imprimerie Royale, 1785), pp. 131–55, at p. 151.

[61] M. J. A. N. Condorcet, 'Premier Mémoire. Nature et objet de l'instruction publique', in Condorcet, *Cinq mémoires sur l'instruction publique*, ed. Coutel and Kintzler (Paris, Librairie du bicentenaire de la Révolution Française, 1989), p. 53.

[62] Ibid., pp. 45–6.