S
everal months after anonymously publishing an essay in 1749 with the title “Letter on the Blind for the Use of Those Who Can See,” the chief editor of the French Encyclopédie was arrested and taken to the prison fortress of Vincennes just east of Paris, France. The correctly assumed author, Denis Diderot, was 35 years old and had not yet left his imprint on the Age of Enlightenment. His letter, which recounted the life of Nicolas Saunderson, a blind mathematician, was intended to advance secular empiricism and disparage the religiously tinged rationalism put forward by Rene Descartes. The letter’s discussion of sensory perception in men born blind dismissed the supposed primacy of visual imagery in abstract thinking. The essay did little to resolve any philosophical controversy, but it marked a turning point in Western attitudes toward visual disability.

To train and question one born blind would be an occupation worthy of the combined talents of Newton, Descartes, Locke, and Leibniz.

Denis Diderot (1713-1784)

For most of history, humans had struggled to feed and shelter themselves. During millennia of marginal existence, blindness was a particularly cruel fate that threatened survival. Throughout the Middle Ages, the blind in Europe were dependent on family, friends, or church for basic needs. Ignorance about the causes of vision loss and the inability of many visually impaired individuals to participate in manual labor contributed to their being misunderstood and isolated. It was not until the late 18th century, with schools for the blind, that the visually impaired were integrated into society in any meaningful way. Other than these schools and the invention of the Braille alphabet, the early path to enfranchisement is seemingly devoid of watershed events. However, a now obscure essay written by Denis Diderot (1713-1784) during the Age of Enlightenment may represent the turning point in Western attitudes toward visual impairment.

In 1749, Diderot, the chief editor of the French Encyclopédie, joined a philosophical debate over whether certain knowledge was based on innate ideas (a basic tenet of rationalism) or sense experience alone (empiricism) with his “Letter on the Blind for the Use of Those Who Can See” (Figure 1). The essay was an ambitious and multifaceted discussion refuting key elements of rationalism and, in particular, Descartes’ thinking about mind-body dualism and the validity of innate concepts. At the time, empiricism was a threat to the church, and to advance this position risked being regarded an atheist. For Diderot, the mind-body disconnection was more theology than science, and correcting the error was worth the risk. To undermine Descartes’ notion of innate ideas, including the idea of God, morality, and logic, Diderot chose to write a parable about men born blind because he saw the so-called primacy of vision as a vulnerable link in Cartesian reasoning. Diderot wanted to play on the popular misconception that seeing was synonymous with understanding thereby minimizing the
notion that vision had a privileged role in human thought and reasoning. Although this strategy seems convoluted, Diderot was able to weave his treatise into a story of human accomplishment, which may explain why the work had wide appeal.

Contrary to his hope, Diderot’s essay had little impact in settling any philosophical controversy. The “Letter” did, however, inadvertently heighten awareness of blindness as a surmountable disability at a time when the absence of sight was broadly stigmatized.

DENIS DIDEROT

Diderot started school at the age of 10 years at the Jesuit College at Langres, France, where he received a well-rounded education. As a pious youth, he thought seriously about joining the church but decided otherwise after moving to Paris in his teens. In 1732, Diderot was awarded the master of art degree from the University of Paris. Preoccupied with language, literature, and mathematics, he earned money translating books and manuscripts into French. The work not only provided a living but also exposed him to the ideas of foreign authors. Diderot became familiar with anatomy and the practice of medicine as the cotranslator of the 3-volume Medical Dictionary of Robert James. At times nearly destitute, Diderot associated with a colony of freethinking iconoclasts, including Rousseau, Condillac, and Voltaire. The erudite atmosphere may have inspired several original works that put him in conflict with government authorities. His “Philosophic Thoughts” (1746) and “Promenade of a Sceptic” (1747) were publicly condemned and in one instance burned by police. Among Paris publishers, however, he was regarded as a man of intellectual integrity and the logical choice to edit the new French Encyclopédie.

Work on the Encyclopédie began in the winter of 1746 and would consume Diderot’s life for 2 decades. When complete, it was a paean to the Age of Reason, a testament to freedom of thought, and an accessible resource for knowledge. Written during a despotic monarchy, the Encyclopédie had to cover science, the trades, and philosophy without offending the king, police censors, or the church. With more than 3000 engravings, it relied on the efficiency of visual illustrations to communicate complex information.

The entire project was almost derailed in 1749 when Diderot was tossed into the dungeon at Vincennes for the clandestine publication of “Letter on the Blind.”

THE “LETTER”

The “Letter” was written as an informal conversation between a narrator and an unidentified woman referred to as “Madame” (Figure 3). The narrator is an acquaintance of the woman and the voice through which Diderot contests prevailing views of what the senses contribute to knowledge and understanding. The proximate stimulus to write the essay came about when the French surgeon Monsieur de Raimur performed eye surgery on a girl with congenital cataracts. The surgery fascinated Diderot and triggered his thinking about the century-old debate over the cognitive effects of visual deprivation. The degree to which thinking ultimately relies on visual imagery and the degree to which ideas rely on innate concepts had intrigued philosophers for centuries. In the 1690s, the Irish lawyer William Molyneux
posed the following question to John Locke:

Suppose a man born blind, and now adult, and taught by his touch to distinguish between a cube and a sphere of the same metal. . . . Suppose then the cube and sphere placed on a table, and the blind man made to see. Quære, whether by his sight, before he touch’d them, could now distinguish, and tell which is the globe, which the cube.1[p146]

Locke responded to the query in his “Essay on Human Understanding,” believing visual recognition still required learning.7(p146) The hypothetical scenario has been known since as the Molyneux problem, and authors have expressed various opinions on the subject to either support or refute the existence of a priori knowledge, which could be triggered by sensory inputs, above all visual ones.

The cataract surgery also made Diderot contemplate Descartes’ mind-body dualism—an erroneous concept for Diderot, who thought it appraised the church at the expense of science. Diderot by this time was an agnostic materialist, believing there was no proof of God’s existence and that everything could be explained in terms of matter and motion. His allegorical narrative drew the reader into the topic through the lives of 2 remarkable men: the first was the man born blind of Puiseaux, France, and the second, Nicholas Saunderson, an early Lucasian professor of mathematics at Cambridge University.

For Descartes, the external physical world ended at the retina, where tiny images were painted on the ocular canvas and projected to the mind. For Diderot, Descartes’ neurophysiology was fantasy beyond the retina.8 Diderot, himself a mathematician, admired Descartes’ work on physiological optics but was disappointed by how such an incisive mind could conjure this model of the brain. The narrator decreed that:

Descartes and all those who have come after him have been unable to provide any clearer idea of vision, and in this respect the great philosopher’s superiority over our blind man was no greater than that of the common man who can see.5(p174)

To explicate the effects of congenital blindness, Diderot has the narrator of the “Letter” interview the man born blind of Puiseaux. The blind man is remarkably cultured and independent. He operates a vineyard and distills liqueurs to sell in Paris. He is a young father, who teaches his son to read using raised letters.1[p171] Early in the interview, the narrator realizes the blind man’s perceptions of the world may, in fact, exceed that of the sighted. After appreciating how accurately the blind man is able to interpret the physical world through touch, the narrator asks him whether he would like to have eyes. The blind man replies: “If I weren’t so curious, I just as soon have long arms. . . . ”1[p176]

When the dialogue turns to aesthetics, the winegrower of Puiseaux teaches his visitor how biased the popular concept of beauty is to a blind man. With the psychology of blindness uncharted territory, Diderot by his sight, before he touch’d them, could now distinguish, and tell which is the globe, which the cube.1[p146]

Saunderson, who lost sight in both eyes before the age of 2 years, was appointed chair of mathematics at Cambridge University, 9 years after Isaac Newton left the post (Figure 4). Saunderson lectured on optics and the nature of light and color. He even explained to students the theory of vision. The narrator opines that Saunderson could only half understand [these phenomena] himself because he could only perceive half the ideas that were attached to the terms he was using.1[p104]

Nevertheless, Saunderson excelled in algebra and geometry, having written the authoritative text Elements of Algebra.9 The method by which Saunderson dealt with mathematics was through a pin and checkers calculator he had invented, a remarkable device by all accounts. The narrator explains in some detail how the pinboard worked, how Saunderson performed mathematical calculations on it, and how it was adapted to the study of geometry (Figure 5).1[p185-190] Indeed, no more suitable figure might have existed to show the fallacy of visual perception as the prerequisite of mathematical reasoning than Professor Saunderson.

The narrator eventually returned to the dilemma presented by Molyneux’s man born blind concluding: I think that the first time the blind man’s eyes receive light, he will see nothing at all. His eye will need some time to give
Diderot conceded nothing to the assumed primacy of visual imagery or to innate knowledge, letting the narrator end his conversation with a warning about the limitations of empirically untested reasoning:

We know therefore almost nothing, and yet how many works there are whose authors have all claimed to know something.1(p219)

Confident he had seeded doubt in the minds of fellow philosophers, Diderot failed to appreciate how differently those outside his intellectual circle would interpret the “Letter.”3,10,11

THE DUNGEON AT VINCENNES

Giving in to his own preconceptions, Diderot upset ecclesiastical authorities with a fictitious passage that would become the most famous part of the essay. The scene took place between Saunderson and his pastor, Gervase Holmes, minutes before the mathematician died. On his deathbed, Saunderson denied, on rational grounds, the existence of God.1(p201) Here Diderot overreached by denying the possibility of a spiritual dimension and, in doing so, risked undermining his earlier arguments. He had naively thought that publishing a nameless essay would guarantee its anonymity, but it did not.

Once in prison, Diderot broke down, offering to name the publisher of the “Letter” to free himself. The betrayal was unnecessary as his then current employer, the influential publisher of the Encyclopédie, intervened on his behalf. The 3-month incarceration may have taught Diderot prudence, but it did little to diminish his secular orientation.

He began work in earnest on the Encyclopédie after his release, a job that matched his creative energies. When the Encyclopédie was published in 1777, its stature grew immensely. As might be anticipated, in interest in his earlier works (including the “Letter”) grew as well.

ATTITUDES TOWARD THE BLIND

Throughout the Middle Ages, the blind were peripheral figures, often itinerants or beggars, and commonly objects of derision.2 In the late 13th century, Louis IX (Saint Louis), on return from the seventh crusade, founded Quinze-Vingts, a hospice for the blind. The fragile fraternity survived on prayer and alms. It kept many with severe visual disability from starving, but by safety net also helped propagate negative stereotypes.3,11 Monarchs after Saint Louis continued the tradition of royal beneficence by approving alms-seeking privileges for the blind. One consequence of this generosity was the swelling population of the blind in Paris. The plight of the disabled may have elicited sympathy and pity from a segment of the population, but the blind were also viewed with suspicion. Some were convinced they possessed supernatural powers and were either prophets or demons.11 Although irrational, these long-standing prejudices were fueled by ignorance and fear. The path to social integration would be slow and hindered.

Juan-Luis Vives (1493-1540), a Spanish humanist and Oxford-educated lawyer, was a voice for poor and disabled individuals at a time when expressing empathy was rare outside the church. In his book On Assistance to the Poor, written in 1526, he proposed that the blind should be treated no differently from the rest of humanity.2 Although irrational, these long-standing prejudices were fueled by ignorance and fear. The path to social integration would be slow and hindered.

Figure 5. Illustration of the calculator invented by Nicolas Saunderson and that Diderot used in his “Letter on the Blind for the Use of Those Who Can See.” Reproduced by courtesy of the university librarian and director, the John Rylands Library, the University of Manchester, Manchester, England.
ness need not result in isolation. Saunderson’s story was as educational as it was inspirational. Cultural historian Moshe Barasch summarizes the impact of Diderot’s “Letter” in these terms:

By showing that the functioning of the blind person’s mind can be rationally analyzed and studied no less than that of the seeing, he brings about the disenchantment of blindness. It is the close of a tradition that had prevailed for almost the whole duration of European culture.1

**SUMMARY**

The example of Saunderson was pivotal in Diderot’s argument for an alternative understanding of abstract thinking. Saunderson’s perceptions came from touch (haptic imagery), yet he comprehended mathematics as if he possessed visual imagery. If haptic imagery is sufficient to acquire knowledge, and just as capable of providing for object recognition, problem solving, and memory retrieval, then both the notion of visual primacy and Cartesian neurophysiology must be wrong. Diderot commented that Saunderson’s soul must be within his fingers, mocking the separation of mind and body along with religion.1

Ironically, Saunderson’s fictional deathbed conversation became the most famous part of the “Letter.” By enlarging his argument from a disagreement over Cartesian philosophy and neurophysiology to the frank denial of a nonmaterial realm, Diderot overreached and opened himself to attack from the powers of the day. After the Encyclopédie elevated Diderot’s profile, his earlier works attracted great attention and inadvertently disseminated awareness of Saunderson. The “Letter” may have been a banal philosophical treatise in comparison with other monumental works during the Age of Enlightenment, but it raised fundamental questions about human perception, cognition, and knowledge that are unresolved to this day. Understandably construed as anticlerical, the “Letter” was also a seminal work that drew attention to visual disability on the eve of modernity.

Submitted for Publication: March 24, 2012; final revision received June 3, 2012; accepted June 3, 2012.

Correspondence: Curtis E. Margo, MD, MPH, Department of Ophthalmology, University of South Florida, Morsani College of Medicine, 12901 Bruce B. Downs Blvd, MCD 21, Tampa, FL 33612 (cmargo@health.usf.edu).

Conflict of Interest Disclosures: None reported.

Previous Presentation: This paper was presented at the Cogan Ophthalmic History Society meeting; March 29, 2012; Bethesda, Maryland.

**REFERENCES**