ADVANCED READING

PASSAGE 1

A major tenet of the neurosciences has been that all neurons (nerve cells) in the brains of vertebrate animals are formed early in development. An adult vertebrate, it was believed, must make do with a fixed number of neurons: those lost through disease or injury are not replaced, and adult learning takes place not through generation of new cells but through modification of connections among existing ones.

However, new evidence for neurogenesis (the birth of new neurons) has come from the study of canary song. Young canaries and other songbirds learn to sing much as humans learn to speak, by imitating models provided by their elders. Several weeks after birth, a young bird produces its first rudimentary attempts at singing; over the next few months the song becomes more structured and stable, reaching a fully developed state by the time the bird approaches its first breeding season. But this repertoire of song is not permanently learned. After each breeding season, during late summer and fall, the bird loses mastery of its developed "vocabulary," and its song becomes as unstable as that of a juvenile bird. During the following winter and spring, however, the canary acquires new songs, and by the next breeding season it has developed an entirely new repertoire.

Recent neurological research into this learning and relearning process has shown that the two most important regions of the canary's brain related to the learning of songs actually vary in size at different times of the year. In the spring, when the bird's song is highly developed and uniform, the regions are roughly twice as large as they are in the fall. Further experiments tracing individual nerve cells within these regions have shown that the number of neurons drops by about 38 percent after the breeding season, but by the following breeding season, new ones have been generated to replace them. A possible explanation for this continual replacement of nerve cells may have to do with the canary's relatively long life span and the requirements of flight. Its brain would have to be substantially larger and heavier than might be feasible for flying if it had to carry all the brain cells needed to process and retain all the information gathered over a lifetime.

Although the idea of neurogenesis in the adult mammalian brain is still not generally accepted, these findings might help uncover a mechanism that would enable the human brain to repair itself through neurogenesis. Whether such replacement of neurons would disrupt complex learning processes or long-term memory is not known, but songbird research challenges scientists to identify the genes or hormones that orchestrate neurogenesis in the young human brain and to learn how to activate them in the adult brain.

PASSAGE 2

For too many years scholars of African American history focused on the harm done by slaveholders and by the institution of slavery, rather than on what Africans in the United States were able to accomplish despite the effects of that institution. In *Myne Owne Ground*, T. H. Breen and Stephen Innes contribute significantly to a recent, welcome shift from a white-centered to a black-centered inquiry into the role of African Americans in the American colonial period. Breen and Innes focus not on slaves, but on a small group of freed indentured servants in Northampton County (in the Chesapeake Bay region of Virginia) who, according to the authors, maintained their freedom, secured property, and interacted with persons of different races and economic standing from 1620 through the 1670s. African Americans living on the Chesapeake were to some extent disadvantaged, say Breen and Innes, but this did not preclude the attainment of status roughly equal to that of certain white planters of the area. Continuously acting within black social networks, and forming economic relationships with white planters, local Native Americans, indentured servants, and white settlers outside the gentry class, the free African Americans of Northampton County held their own in the rough-hewn world of Chesapeake Bay.

The authors emphasize that in this early period, when the percentage of African Americans in any given Chesapeake county was still no more than 10 percent of the population, very little was predetermined so far as racial status or race relations were concerned. By schooling themselves in the local legal process and by working prodigiously on the land, African Americans acquired property, established families, and warded off contentious white neighbors. Breen and Innes do acknowledge that political power on the Chesapeake was asymmetrically distributed among black and white residents. However, they underemphasize much evidence that customary law, only gradually embodies in statutory law, was closing in on free African Americans well before the 1670s: during the 1660s, when the proportion of African Americans in Virginia increased dramatically, Virginia tightened a law regulating interracial relations (1662) and enacted a statute prohibiting baptism from altering slave status (1667). Anthony Johnson, a leader in the community of free African Americans in the Chesapeake Bay region, sold the land he had cultivated for more than twenty years and moved north with his family around 1665, an action that the authors attribute to a search for "fresh, more productive land." But the answer to why the Johnsons left that area where they had labored so long may lie in their realization that their white neighbors were already beginning the transition from a largely white indentured labor force to reliance on a largely black slave labor force, and that the institution of slavery was threatening their descendants' chances for freedom and success in Virginia.

PASSAGE 3

Late nineteenth-century books about the French artist Watteau (1684-1721) betray a curious blind spot: more than any single artist before or since, Watteau provided his age with an influential image of itself, and nineteenth-century writers accepted this image as genuine. This was largely due to the enterprise of Watteau's friends who, soon after his death, organized the printing of engraved reproductions of the great bulk of his work—both his paintings and his drawings—so that Watteau's total artistic output became and continued to be more accessible than that of any other artist until the twentieth-century advent of art monographs illustrated with photographs. These engravings presented aristocratic (and would-be aristocratic) eighteenth-century French society with an image of itself that was highly acceptable and widely imitate by other artists, however little relationship that image bore to reality. By 1884, the bicentenary of Watteau's birth, it was standard practice for biographers to refer to him as "the personification of the witty and amiable eighteenth century."

In fact, Watteau saw little enough of that "witty and amiable" century for which so much nostalgia was generally felt between about 1870 and 1920, a period during which enthusiasm for the artist reached its peak. The eighteenth century's first decades, the period of his artistic activity, were fairly calamitous ones. During his short life, France was almost continually at war: his native region was overrun with foreign troops, and Paris was threatened by siege and by a rampaging army rabble. The dreadful winter of 1709, the year of Watteau's first Paris successes, was marked by military defeat and a disastrous famine.

Most of Watteau's nineteenth-century admirers simply ignored the grim background of the works they found so lyrical and charming. Those who took the inconvenient historical facts into consideration did so only in order to refute the widely held deterministic view that the content and style of an artist's work were absolutely dictated by heredity and environment. (For Watteau admirers, such determinism was unthinkable: the artist was born in a Flemish town only six years after it first became part of France, yet Watteau was quintessentially French. As one patriotic French biographer put it, "In Dreden, Potsdam, and Berlin I have never come across a Watteau without feeling refreshed by a breath of native air." Even such writers, however, persisted in according Watteau's canvases a privileged status as representative "personifications" of the eighteenth century. The discrepancy between historical fact and artistic vision, useful in refuting the extreme deterministic position, merely forced these writers to seek a new formula that allowed them to preserve the desired identity between image and reality, this time a rather suspiciously psychic one: Watteau did not record the society he knew, but rather "foresaw" a society that developed shortly after his death.

PASSAGE 4

Faced with the problems of insufficient evidence, of conflicting evidence, and of evidence relayed through the flawed perceptual, retentive, and narrative abilities of witnesses, a jury is forced to draw inferences in its attempt to ascertain the truth. By applying the same cognitive tools they have developed and used over a lifetime, jurors engage in the inferential exercise that lawyers call fact-finding. In certain decision-making contexts that are relevant to the trial of lawsuits, however, these normally reliable cognitive tools may cause jurors to commit inferential errors that distort rather than reveal the truth.

Although juries can make a variety of inferential errors, most of these mistakes in judgment involve the drawing of an unwarranted conclusion from the evidence, that is, deciding that the evidence proves something that, in reality, it does not prove. For example, evidence that the defendant in a criminal prosecution has a prior conviction may encourage jurors to presume the defendant's guilt, because of their preconception that a person previously convicted of a crime must be inclined toward repeated criminal behavior. That commonly held belief is at least a partial distortion of reality; not all former convicts engage in repeated criminal behavior. Also, jury may give more probative weight than objective analysis would allow to vivid photographic evidence depicting a shooting victim's wounds, or may underestimate the weight of defense testimony that is not delivered in a sufficiently forceful or persuasive manner. Finally, complex or voluminous evidence might be so confusing to a jury that its members would draw totally unwarranted conclusions or even ignore the evidence entirely.

Recent empirical research in cognitive psychology suggests that people tend to commit inferential errors like these under certain predictable circumstances. By examining the available information, the situation, and the type of decision being made, cognitive psychologists can describe the kinds of inferential errors a person or group is likely to make. These patterns of human decision-making may provide the courts with a guide to evaluating the effect of evidence on the reliability of the jury's inferential processes in certain situations.

The notion that juries can commit inferential errors that jeopardize the accuracy of the fact-finding process is not unknown to the courts. In fact, one of a presiding judge's duties is to minimize jury inferential error through explanation and clarification. Nonetheless, most judges now employ only a limited and primitive concept of jury inferential error: limited because it fails to recognize the potential for error outside certain traditional situations, primitive because it ignores the research and conclusions of psychologists in favor of notions about human cognition held by lawyers.