

(1)

Ragwort was accidentally introduced to New Zealand in the late nineteenth century and, like so many invading foreign species, quickly became a pest. By the 1920s, the weed was rampant. What made matters worse was that its proliferation coincided with sweeping changes in agriculture and a massive shift from sheep farming to dairying. Ragwort contains a battery of toxic and resilient alkaloids: even honey made from its flowers contains the poison in dilute form. Livestock generally avoid grazing where ragwort is growing, but they will do so once it displaces grass and clover in their pasture. Though sheep can eat it for months before showing any signs of illness, if cattle eat it they sicken quickly, and fatality can even result.

(2)

Despite the fact that the health-inspection procedures for catering establishments are more stringent than those for ordinary restaurants, more of the cases of food poisoning reported to the city health department were brought on by banquets served by catering services than were brought on by restaurant meals.

(3)

African American newspapers in the 1930s faced many hardships. For instance, knowing that buyers of African American papers also bought general-circulation papers, advertisers of consumer products often ignored African American publications. Advertisers' discrimination did free the African American press from advertiser domination. Editors could print politically charged material more readily than could the large national dailies, which depended on advertisers' ideological approval to secure revenues. Unfortunately, it also made the selling price of Black papers much higher than that of general-circulation dailies. Often as much as two-thirds of publication costs had to come from subscribers or subsidies from community politicians and other interest groups. And despite their editorial freedom, African American publishers often felt compelled to print a disproportionate amount of sensationalism, sports, and society news to boost circulation.

(4)

Years ago, consumers in Frieland began paying an energy tax in the form of two Frieland pennies for each unit of energy consumed that came from nonrenewable sources. Following the introduction of this energy tax, there was a steady reduction in the total yearly consumption of energy from nonrenewable sources.

(5)

In a plausible but speculative scenario, oceanographer Douglas Martinson suggests that temperature increases caused by global warming would not significantly affect the stability of the Antarctic environment, where sea ice forms on the periphery of the continent in the

autumn and winter and mostly disappears in the summer. True, less sea ice would form in the winter because global warming would cause temperatures to rise. However, Martinson argues, the effect of a warmer atmosphere may be offset as follows. The formation of sea ice causes the concentration of salt in surface waters to increase; less sea ice would mean a smaller increase in the concentration of salt. Less salty surface waters would be less dense and therefore less likely to sink and stir up deep water. The deep water, with all its stored heat, would rise to the surface at a slower rate. Thus, although the winter sea-ice cover might decrease, the surface waters would remain cold enough so that the decrease would not be excessive.

(6)

That sales can be increased by the presence of sunlight within a store has been shown by the experience of the only Savefast department store with a large skylight. The skylight allows sunlight into half of the store, reducing the need for artificial light. The rest of the store uses only artificial light. Since the store opened two years ago, the departments on the sunlit side have had substantially higher sales than the other departments.

(7)

While the best sixteenth-century Renaissance scholars mastered the classics of ancient Roman literature in the original Latin and understood them in their original historical context, most of the scholars' educated contemporaries knew the classics only from school lessons on selected Latin texts. These were chosen by Renaissance teachers after much deliberation, for works written by and for the sophisticated adults of pagan Rome were not always considered suitable for the Renaissance young: the central Roman classics refused (as classics often do) to teach appropriate morality and frequently suggested the opposite. Teachers accordingly made students' needs, not textual and historical accuracy, their supreme interest, chopping dangerous texts into short phrases, and using these to impart lessons extemporaneously on a variety of subjects, from syntax to science. Thus, I believe that a modern reader cannot know the associations that a line of ancient Roman poetry or prose had for any particular educated sixteenth-century reader.

(8)

In humans, the pilomotor reflex leads to the response commonly known as goose bumps, and this response is widely considered to be vestigial—that is, something formerly having a greater physiological advantage than at present. It occurs when the tiny muscle at the base of a hair follicle contracts, pulling the hair upright. In animals with feathers, fur, or quills, this creates a layer of insulating warm air or a reason for predators to think twice before attacking. But human hair is too puny to serve these functions. Goose bumps in humans may, however, have acquired a new role. Like flushing—another thermoregulatory (heat-regulating) mechanism—goose bumps have become linked with

emotional responses, notably fear, rage, or the pleasure of, say, listening to beautiful music. They may thus serve as a signal to others.

(9)

This passage is adapted from material published in 2001.

Frederick Douglass was unquestionably the most famous African American of the nineteenth century; indeed, when he died in 1895 he was among the most distinguished public figures in the United States. In his study of Douglass' career as a major figure in the movement to abolish slavery and as a spokesman for Black rights, Waldo Martin has provoked controversy by contending that Douglass also deserves a prominent place in the intellectual history of the United States because he exemplified so many strands of nineteenth-century thought: romanticism, idealism, individualism, liberal humanism, and an unshakable belief in progress. But this very argument provides ammunition for those who claim that most of Douglass' ideas, being so representative of their time, are now obsolete. Douglass' vision of the future as a melting pot in which all racial and ethnic differences would dissolve into "a composite American nationality" appears from the pluralist perspective of many present-day intellectuals to be not only utopian but even wrongheaded. Yet there is a central aspect of Douglass' thought that seems not in the least bit dated or irrelevant to current concerns. He has no rival in the history of the nineteenth century United States as an insistent and effective critic of the doctrine of innate racial inequality. He not only attacked racist ideas in his speeches and writings, but he offered his entire career and all his achievements as living proof that racists were wrong in their belief that one race could be inherently superior to another.

While Martin stresses Douglass' antiracist egalitarianism, he does not adequately explain how this aspect of Douglass' thought fits in with his espousal of the liberal Victorian attitudes that many present-day intellectuals consider to be naïve and outdated. The fact is that Douglass was attracted to these democratic-capitalist ideals of his time because they could be used to attack slavery and the doctrine of White supremacy. His favorite rhetorical strategy was to expose the hypocrisy of those who, while professing adherence to the ideals of democracy and equality of opportunity, condoned slavery and racial discrimination. It would have been strange indeed if he had not embraced liberal idealism, because it proved its worth for the cause of racial equality during the national crisis that eventually resulted in emancipation and citizenship for African Americans. These points may seem obvious, but had Martin given them more attention, his analysis might have constituted a more convincing rebuttal to those critics who dismiss Douglass' ideology as a relic of the past. If one accepts the proposition that Douglass' deepest commitment was to Black equality and that he used the liberal ideals of his time as weapons in the fight for that cause, then it is hard to fault him for seizing the best weapons at hand.

(10)

The plant called the scarlet gilia can have either red or white flowers. It had long been thought that hummingbirds, which forage by day, pollinate

its red flowers and that hawkmoths, which forage at night, pollinate its white flowers. To try to show that this pattern of pollination by colors exists, scientists recently covered some scarlet gilia flowers only at night and others only by day: plants with red flowers covered at night became pollinated; plants with white flowers covered by day became pollinated.

(11)

Supernovas in the Milky Way are the likeliest source for most of the cosmic rays reaching Earth. However, calculations show that supernovas cannot produce ultrahigh-energy cosmic rays (UHECRs), which have energies exceeding 10¹⁸ electron volts. It would seem sensible to seek the source of these in the universe's most conspicuous energy factories: quasars and gamma-ray bursts billions of light-years away from Earth. But UHECRs tend to collide with photons of the cosmic microwave background—pervasive radiation that is a relic of the early universe. The odds favor a collision every 20 million light-years, each collision costing 20 percent of the cosmic ray's energy. Consequently, no cosmic ray traveling much beyond 100 million light-years can retain the energy observed in UHECRs.

(12)

The massive influx of women cyclists—making up at least a third of the total market— was perhaps the most striking and profound social consequence of the mid-1890s cycling boom. Although the new, improved bicycle had appealed immediately to a few privileged women, its impact would have been modest had it not attracted a greater cross section of the female population. It soon became apparent that many of these pioneer women bicyclists had not taken up the sport as an idle pastime. Rather, they saw cycling as a noble cause to be promoted among all women as a means to improve the general female condition. Not only would cycling encourage healthy outdoor exercise, they reasoned, it would also hasten long-overdue dress reform. To feminists, the bicycle affirmed nothing less than the dignity and equality of women.

(13)

What causes a helix in nature to appear with either a dextral (right-handed, or clockwise) twist or a sinistral (left-handed, or counterclockwise) twist is one of the most intriguing puzzles in the science of form. Most spiral-shaped snail species are predominantly dextral. But at one time, handedness (twist direction of the shell) was equally distributed within some snail species that have become predominantly dextral or, in a few species, predominantly sinistral. What mechanisms control handedness and keep left-handedness rare?

It would seem unlikely that evolution should discriminate against sinistral snails if sinistral and dextral snails are exact mirror images, for any disadvantage that a sinistral twist in itself could confer on its possessor is almost inconceivable. But left- and right-handed snails are not actually true mirror images of one another. Their shapes are noticeably different. Sinistral rarity might, then, be a consequence of possible disadvantages

conferred by these other concomitant structural features. In addition, perhaps left- and right-handed snails cannot mate with each other, having incompatible twist directions. Presumably an individual of the rarer form would have relative difficulty in finding a mate of the same hand, thus keeping the rare form rare or creating geographically separated right- and left-handed populations.

But this evolutionary mechanism combining dissymmetry, anatomy, and chance does not provide an adequate explanation of why right-handedness should have become predominant. It does not explain, for example, why the infrequent unions between snails of opposing hands produce fewer offspring of the rarer than the commoner form in species where each parent contributes equally to handedness. Nor does it explain why, in a species where one parent determines handedness, a brood is not exclusively right- or left-handed when the offspring would have the same genetic predisposition. In the European pond snail *Lymnaea peregra*, a predominantly dextral species whose handedness is maternally determined, a brood might be expected to be exclusively right- or left-handed—and this often occurs. However, some broods possess a few snails of the opposing hand, and in predominantly sinistral broods, the incidence of dextrality is surprisingly high.

Here, the evolutionary theory must defer to a theory based on an explicit developmental mechanism that can favor either right- or left-handedness. In the case of *Lymnaea peregra*, studies indicate that a dextral gene is expressed during egg formation; i.e., before egg fertilization, the gene produces a protein, found in the cytoplasm of the egg, that controls the pattern of cell division and thus handedness. In experiments, an injection of cytoplasm from dextral eggs changes the pattern of sinistral eggs, but an injection from sinistral eggs does not influence dextral eggs. One explanation for the differing effects is that all *Lymnaea peregra* eggs begin left-handed but most switch to being right-handed. Thus the path to a solution to the puzzle of handedness in all snails appears to be as twisted as the helix itself.

(14)

X-ray examination of a recently discovered painting—judged by some authorities to be a self-portrait by Vincent van Gogh—revealed an underimage of a woman's face. Either van Gogh or another painter covered the first painting with the portrait now seen on the surface of the canvas. Because the face of the woman in the underimage also appears on canvases van Gogh is known to have painted, the surface painting must be an authentic self-portrait by van Gogh.

(15)

Despite hypotheses ranging from armed conflict to climate change, the abandonment of more than 600 Pueblo cliff dwellings in Mesa Verde by A.D. 1300 still puzzles archaeologists. Researchers analyzing refuse from one Pueblo community found remains of maize—a Pueblo crop—in 44 percent of samples from years when the community flourished, but in only 10 percent of samples from years near the time of depopulation, while the remains of wild plants increased significantly.

Bones found in the samples showed that the consumption of domesticated turkeys—which were fed maize—decreased from 55 to 14 percent, while there was a marked increase in wild-animal bones. These data suggest that near the end of the site's occupation, villagers experienced substantial food shortages and adopted hunting-and-gathering strategies to compensate for crop failure.

(16)

Although it is intuitively clear that an increase in antipredator behavior lowers an animal's risk of predation when predators are present, such benefits are not easily demonstrated. One study that did so found that well-fed guppies are more alert for predators and are consequently less likely to be killed than are their hungry counterparts, which feed with greater intensity. It is also well documented that a decrease in activity lowers an animal's risk of predation by reducing the probability of being detected or encountered by a predator. This effect was convincingly demonstrated by a study in which it was found that partially anesthetized tadpoles were less likely to be captured by dragonfly larvae than were unanesthetized tadpoles.

(17)

Since the 1980s, experts have been claiming that the skill demands of today's jobs have outstripped the skills workers possess. Moss and Tilly counter that worker deficiencies lie less in job-specific skills than in such attributes as motivation, interpersonal skills, and appropriate work demeanor. However, Handel suggests that these perceived deficiencies are merely an age effect, arguing that workers pass through a phase of early adulthood characterized by weak attachment to their jobs. As they mature, workers grow out of casual work attitudes and adjust to the workplace norms of jobs that they are more interested in retaining. Significantly, complaints regarding younger workers have persisted for over two decades, but similar complaints regarding older workers have not grown as the earlier cohorts aged.

(18)

In the early twentieth century, the idea that pianists should be musician-scholars whose playing reflected the way composers wanted their music to sound replaced the notion that pianists should be virtuosos whose performances thrilled audiences with emotional daring and showy displays of technique. One important figure to emerge in the period, though a harpsichordist rather than a pianist, was Wanda Landowska (1879–1959). She demonstrated how the keyboard works of Baroque composers such as Bach, Handel, Scarlatti, and Couperin probably sounded in their own times. It would be a mistake to consider Landowska a classicist, however. She had been born in an age of Romantic playing dominated by Liszt, Leschetizky, and their pupils. Thus she grew up with and was influenced by certain Romantic traditions of performance, whatever the stringency of her musical scholarship; Landowska knew how to hold audiences breathless, and when she gave recitals, they

responded with deathlike silence and rapt attention.

Her playing was Romantic, but it was at least as close in spirit to the style of playing intended by composers of the Baroque (1600–1750) and Classical (1750–1830) eras, as have been the more exacting but less emotionally resonant interpretations of most harpsichordists since Landowska. She had a miraculous quality of touch, a seemingly autonomous left hand; no artist in her generation could clarify with such deftness the polyphonic writing of the Baroque masters. And none could make their music so spring to life.

Her achievements were the result of a lifetime of scholarship, truly remarkable physical gifts, and resilient rhythm, all combined with excellent judgment about when not to hold the printed note sacrosanct. Of course, developing such judgment demanded considerable experience and imagination. She was a genius at underlining the dramatic and emotional content of a piece, and to do so, she took liberties, all kinds of liberties, while nevertheless preserving the integrity of a composer's score. In short, her entire musical approach was Romantic: intensely personal, full of light and shade, never pedantic.

Thanks to Landowska, Bach's music (originally composed for the harpsichord) now sounded inappropriately thick when played on the piano. One by one, pianists stopped playing Bach's music as adapted for the piano by Liszt or by Tausig. Then they gradually stopped performing any kind of Baroque music on the piano, even Scarlatti's. The piano repertoire, it began to be felt, was extensive enough without reverting to transcriptions of Baroque music originally written for the harpsichord—and piano performances of Bach and Scarlatti were, despite the obvious similarities between the harpsichord and the piano, transcriptions, no matter how faithfully the original notes were played. In accordance with this kind of purism came an emphasis on studying composers' manuscript notations, a relatively new field of musicology that is flourishing even today.

(19)

Scientists formerly believed that the rocky planets—Earth, Mercury, Venus, and Mars—were created by the rapid gravitational collapse of a dust cloud, a deflation giving rise to a dense orb. That view was challenged in the 1960s, when studies of Moon craters revealed that these craters were caused by the impact of objects that were in great abundance about 4.5 billion years ago but whose number appeared to have quickly decreased shortly thereafter. This observation rejuvenated Otto Schmidt's 1944 theory of accretion. According to this theory, cosmic dust gradually lumped into ever-larger conglomerates: particulates, gravel, small and then larger balls, planetesimals (tiny planets), and, ultimately, planets. As the planetesimals became larger, their numbers decreased. Consequently, the number of collisions between planetesimals decreased.

(20)

Despite a dramatic increase in the number of people riding bicycles for recreation in Parkville, a recent report by the Parkville Department of

Transportation shows that the number of accidents involving bicycles has decreased for the third consecutive year.

(21)

What makes a worker ant perform one particular task rather than another? From the 1970s to the mid-1980s, researchers emphasized internal factors within individual ants, such as polymorphism, the presence in the nest of workers of different shapes and sizes, each suited to a particular task. Other elements then considered to have primary influence upon an ant's career were its age—it might change tasks as it got older—and its genetics. However, subsequent ant researchers have focused on external prompts for behavior. In advocating this approach, Deborah Gordon cites experiments in which intervention in a colony's makeup perturbed worker activity. By removing workers or otherwise altering the nest conditions, researchers were able to change the tasks performed by individual workers.

(22)

This passage is adapted from material published in 2001.

In 1998 scientists using the neutrino detector in Kamioka, Japan, were able to observe several thousand neutrinos—elusive, tiny subatomic particles moving at nearly the speed of light and passing through almost everything in their path. The Kamioka findings have potentially far-reaching ramifications. They strongly suggest that the neutrino has mass, albeit an infinitesimal amount. Even a tiny mass means that neutrinos would outweigh all the universe's visible matter, because of their vast numbers. The findings also suggest that a given neutrino does not have one stable mass or one stable identity; instead it oscillates from one identity or “flavor” (physicists’ term describing how neutrinos interact with other particles) to another. This oscillation may explain why, although the Sun is a large source of neutrinos, detectors capture far fewer solar neutrinos than the best theory of solar physics predicts: the neutrinos may be changing to flavors undetectable by detectors. Finally, while the standard particle-physics model—which describes all matter in terms of twelve fundamental particles and four fundamental forces—does not allow for neutrinos with mass, there are theories that do. Further experiments to confirm that neutrinos have mass could help physicists determine which, if any, of these theories is correct.

(23)

Mayor: Four years ago, when we reorganized the city police department in order to save money, critics claimed that the reorganization would make the police less responsive to citizens and would thus lead to more crime. The police have compiled theft statistics from the years following the reorganization that show that the critics were wrong. There was an overall decrease in reports of thefts of all kinds, including small thefts.

(24)

During the 1920s, most advocates of scientific management, Frederick Taylor's method for maximizing workers' productivity by rigorously routinizing their jobs, opposed the five-day workweek. Although scientific managers conceded that reducing hours might provide an incentive to workers, in practice they more often used pay differentials to encourage higher productivity. Those reformers who wished to embrace both scientific management and reduced hours had to make a largely negative case, portraying the latter as an antidote to the rigors of the former.

In contrast to the scientific managers, Henry Ford claimed that shorter hours led to greater productivity and profits. However, few employers matched either Ford's vision or his specific interest in mass marketing a product — automobiles — that required leisure for its use, and few unions succeeded in securing shorter hours through bargaining. At its 1928 convention, the American Federation of Labor (AFL) boasted of approximately 165,000 members working five-day, 40-hour weeks. But although this represented an increase of about 75,000 since 1926, about 70 percent of the total came from five extremely well-organized building trades' unions.

(25)

In November 1753, the British author Sarah Fielding accepted half the payment for her novel *The Cry* and asked that the other half, when due, go to her "or to whomsoever I shall appoint," perhaps indicating that the remaining share was intended for someone else. Indeed, many think that the novel was a collaborative venture between Fielding and Jane Collier. This particular collaboration was likely enough, as the two were close friends with common interests. They wrote jointly authored letters, were both published authors with a lively interest in each other's work, and were enthusiastic supporters of didacticism and innovation in fiction—central concerns of *The Cry*. However, contemporaries ascribed the work solely to Fielding, and there is nothing in the novel that is incompatible with Fielding's other writings.

(26)

The binary planet hypothesis—that Earth and the Moon formed simultaneously by the accretion of smaller objects—does not explain why the Moon's iron core is so small relative to the Moon's total volume, compared with Earth's core relative to Earth's total volume. According to the giant impact hypothesis, the Moon was created during a collision between Earth and a large object about the size of Mars. Computer simulations of this impact show that both of the objects would melt in the impact and the dense core of the impactor would fall as molten rock into the liquefied iron core of Earth. The ejected matter—mantle rock that had surrounded the cores of both objects—would be almost devoid of iron. This matter would become the Moon.

(27)

Most recent work on the history of leisure in Europe has been based on the central hypothesis of a fundamental discontinuity between

preindustrial and industrial societies. According to this view, the modern idea of leisure did not exist in medieval and early modern Europe: the modern distinction between the categories of work and leisure was a product of industrial capitalism. Preindustrial societies had festivals (together with informal and irregular breaks from work), while industrial societies have leisure in the form of weekends and vacations. The emergence of leisure is therefore part of the process of modernization. If this theory is correct, there is what Michel Foucault called a conceptual rupture between the two periods, and so the very idea of a history of leisure before the Industrial Revolution is an anachronism.

To reject the idea that leisure has had a continuous history from the Middle Ages to the present is not to deny that late medieval and early modern Europeans engaged in many pursuits that are now commonly considered leisure or sporting activities—jousting, hunting, tennis, card playing, travel, and so on—or that Europe in this period was dominated by a privileged class that engaged in these pursuits. What is involved in the discontinuity hypothesis is the recognition that the people of the Middle Ages and early modern Europe did not regard as belonging to a common category activities (hunting and gambling, for example) that are usually classified together today under the heading of leisure. Consider fencing: today it may be considered a “sport,” but for the gentleman of the Renaissance it was an art or science. Conversely, activities that today may be considered serious, notably warfare, were often described as pastimes.

Serious pitfalls, therefore, confront historians of leisure who assume continuity and who work with the modern concepts of leisure and sport, projecting them back onto the past without asking about the meanings contemporaries gave to their activities. However, the discontinuity hypothesis can pose problems of its own. Historians holding this view attempt to avoid anachronism by means of a simple dichotomy, cutting European history into two eras, preindustrial and industrial, setting up the binary opposition between a “festival culture” and a “leisure culture.” The dichotomy remains of use insofar as it reminds us that the rise of industrial capitalism was not purely a phenomenon of economic history, but had social and cultural preconditions and consequences. The dichotomy, however, leads to distortions when it reduces a great variety of medieval and early modern European ideas, assumptions, and practices to the simple formula implied by the phrase “festival culture.”

(28)

James W. Coleman's book on John Edgar Wideman's literary career addresses the needs of a general, if well-read, public rather than the esoteric vanities of scholarly specialists, whom he neither ignores nor flatters. To assume the former audience was familiar with every work Wideman ever penned would have been pretentious. Instead, Coleman furnishes more than ample descriptive criticism and background information, avoiding the cryptic allusiveness that is favored by some academic critics but that discourages the undergraduate audience he likely envisioned. Unfortunately, this accent on bringing serious Wideman criticism to a broader audience often frustrates the reader who wishes that announced themes, techniques, and stylistic devices would not whisk

by as quickly as world capitals on a seven-day package tour of the globe.

(29)

The painter Peter Brandon never dated his works, and their chronology is only now beginning to take shape in the critical literature. A recent dating of a Brandon self-portrait to 1930 is surely wrong. Brandon was 63 years old in 1930, yet the painting shows a young, dark-haired man—obviously Brandon, but clearly not a man of 63.

(30)

Experts have differed about where the genus *Varanus* (monitor lizards) originated. Because most existing species live in Australia, early researchers concluded that *Varanus* originated in Australia and subsequently island hopped westward along the Indo-Australian archipelago. Herpetologist Robert Mertens later argued that *Varanus* probably originated in the archipelago. Chromosomal analysis has since supported Mertens' contention, and in addition, geologic evidence points to a collision between the archipelago and the Australian landmass after *Varanus* evolved—a fact that could account for the genus' present distribution.

A related puzzle for scientists is the present distribution of *Varanus*' largest surviving species, the Komodo dragon. These carnivores live only on four small islands in the archipelago where, scientists note, the prey base is too small to support mammalian carnivores. But the Komodo dragon has recently been shown to manage body temperature much more efficiently than do mammalian carnivores, enabling it to survive on about a tenth of the food energy required by a mammalian carnivore of comparable size.

(31)

Geographers and historians have traditionally held the view that Antarctica was first sighted around 1820, but some sixteenth-century European maps show a body that resembles the polar landmass, even though explorers of the period never saw it. Some scholars, therefore, argue that the continent must have been discovered and mapped by the ancients, whose maps are known to have served as models for the European cartographers.

(1)



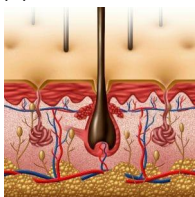
(ragwort)

(6)



(skylight)

(8)



(hair follicle)



(quill)

(10)



(scarlet gilia)



(13)



(*Lymnaea peregra*)
(15)



(Pueblo)

(16)



(guppy)

(18)



(harpsichord)

(30)



(Indo-Australian archipelago) (Komodo Dragon)