HEAD IN THE CLOUD

Introduction

Facts Are Obsolete

It was an industry party in Malibu, and a group was engaged in the Hollywood sport of picking apart a rival's product. Kenneth Branagh's big-budget, Victorian-dress film version of *Hamlet* had bombed at the box office. The stars—from Derek Jacobi and Judi Dench to Robin Williams and Billy Crystal—were expensively miscast. Even that couldn't explain the dismal $90,000 box office on opening weekend.

"Maybe," someone joked, "it was the screenwriter."

"Who wrote it?" asked a studio executive.

"I meant Shakespeare," the speaker said.

The studio exec still didn't understand. *William Shakespeare!* people explained. Not a living screenwriter but the greatest playwright of the English language—long, long dead!

The executive, who had studied law at the University of Southern California and had graduated with honours, knew of Shakespeare, of course. She just didn't know that the film *Hamlet* had been based on something Shakespeare had written.

I live in Los Angeles, where stories like this are not uncommon. Hollywood has always been a melting pot of the erudite and the

oblivious. Consider *The Boy Next Door*, a 2015 thriller starring J. Lo. In one scene a sexy neighbour gives J. Lo a first edition of Homer's *Iliad*. "This must have cost a fortune!" she protests.

"It was a buck at a garage sale," says the neighbour.

The *Iliad* was composed about 2,300 years before the invention of printing. A clip of the "first edition" scene broke the more literate half of the Internet. Among the Twitter comments were:

> I have to show you my first edition Torah sometime. Found in a dumpster one day.
>
> What they don't show you is the time machine and the room where they have Homer chained to a desk.
>
> Oh crap. Western Civilization is screwed.

Asked for comment, the film's screenwriter, Barbara Curry, said the first-edition *Iliad* bit "was not something I wrote in my original script."

In fairness, bibliophiles do speak of a "first edition" of the *Iliad* and *Odyssey*. It was printed in Florence, in the Greek language, in 1488. Sotheby's recently auctioned a copy for twenty-five thousand pounds, which might qualify as a fortune. It's definitely not the same as the book in the movie, which is printed in English and has pristine gilt-edged pages. The Internet hecklers had a point: to any literate person, the casual mention of a first edition of Homer's *Iliad* is going to cause a double-take. It would have been easy to make it a first edition of *Breakfast at Tiffany's*, *Infinite Jest*, or any modern novel that one might actually find at a garage sale. The film-makers were either confident that no one watching *The Boy Next Door* would perceive any incongruity or they themselves didn't. J. Lo's character in the movie is an English teacher.

The 2011 animated film *Rango* concerns a chameleon who becomes sheriff of an Old West town of winsome, computer-generated creatures. Director Gore Verbinski described the way he came up with that premise: "We were just batting around ideas, like…What

about an animated Western with creatures of the desert? That was basically the sentence. From there, there's got to be the character who's an outsider in the classic sense, and if it's the desert, what if he's aquatic? If he's aquatic, what if he's a chameleon?"

Bingo. A chameleon it was. Uh…except that chameleons aren't aquatic. They're lizards that inhabit African forests, grasslands, and deserts. A chameleon in the desert is hardly a fish out of water.

Verbinski, a successful director known for the globally profitable *Pirates of the Caribbean* franchise, apparently didn't know this. And in none of the pitch sessions did someone say, "Well, that outsider idea is great, Gore, but you know, a chameleon isn't a water creature…"

Does it matter? It's only a cartoon. Chameleons don't *talk*, either, but Rango does. That analogy goes only so far. It's amusing to see animals talk in movies because everyone knows that animals don't talk. Calling chameleons aquatic is a simple goof, a departure from reality with no artistic or entertainment value. Verbinski stands near the top of a competitive profession. What his mistake shows is not so much that he's ill informed as that he's embedded in a culture that doesn't care about facts. That culture is not Hollywood—it's twenty-first century society.

Part One

The Dunning–Kruger Effect

One

"I Wore the Juice"

At five foot six and nineteen stone, the bank robber was impossible to miss. On April 19, 1995, he hit two Pittsburgh banks in broad daylight. Security cameras picked up good images of his face—he wore no mask—and showed him holding a gun to the teller. Police made sure the footage was broadcast on the local eleven o'clock news. A tip came in within minutes, and just after midnight, the police were knocking on the suspect's door in McKeesport. Identified as McArthur Wheeler, he was incredulous. "But I wore the juice," he said.

Wheeler told police he rubbed lemon juice on his face to make it invisible to security cameras. Detectives concluded he was not delusional, not on drugs—just incredibly mistaken.

Wheeler knew that lemon juice is used as an invisible ink. Logically, then, lemon juice would make his face invisible to cameras. He tested this out before the heists, putting juice on his face and snapping a selfie with a Polaroid camera. There was no face in the photo! (Police never figured that out. Most likely Wheeler was no more competent as a photographer than he was as a bank robber.)

Wheeler reported one problem with his scheme. The lemon juice stung his eyes so badly that he could barely see.

Wheeler went to jail and into the annals of the world's dumbest criminals. It was such a feature, in the 1996 *World Almanac*, that brought Wheeler's story to the attention of David Dunning, a Cornell psychology professor. He saw in this tale of dim-witted woe something universal. Those most lacking in knowledge and skills are least able to appreciate that lack. This observation would eventually become known as the Dunning–Kruger effect.

Dunning and a graduate student, Justin Kruger, embarked on a series of experiments testing this premise. They quizzed undergraduate psychology students on grammar, logic, and jokes, then asked the students to estimate their scores and also estimate how well they did relative to others (on a percentile basis). The students who scored lowest had greatly exaggerated notions of how well they did. Dunning had expected that, but not the magnitude of the effect. His first reaction to the results was, "*Wow*". Those who scored near the bottom estimated that their skills were superior to two-thirds of the other students.

Those who scored higher had, as might be expected, more accurate perceptions of their abilities. But (are you ready for this?) the group that scored highest slightly *underestimated* their performance relative to others.

As the researchers observed, the only way to know how well you did on a grammar quiz is to know grammar. Those lacking that knowledge were also least able to gauge their knowledge. They were oblivious to their own ignorance.

Everyone thinks he or she knows what's funny. The joke test included these two examples:

1. Question: What is as big as a man but weighs nothing?
   Answer: His shadow.

2. If a kid asks where rain comes from, I think a cute thing to tell him is, "God is crying." And if he asks why God is crying, another cute thing to tell him is, "Probably because of something you did."

The goal was to rate the funniness of each joke. Dunning and Kruger had a panel of professional comedians rate the jokes, and their averaged opinions were then considered "correct." The comedians judged the first joke as not funny at all, while the second (written by *Saturday Night Live* writer Jack Handey) was rated very funny. Some quiz takers struggled to make that kind of distinction—yet were confident of their ability to determine what's funny.

Later research went far beyond the university. For one experiment Dunning and Kruger recruited gun hobbyists at a trap-shooting and skeet-shooting competition. Volunteers took a ten-question gun safety and knowledge quiz adapted from one published by the National Rifle Association. Again, the gun owners who knew the least about firearm safety wildly overestimated their knowledge.

Like most rules, this one has exceptions. "One need not look far," Dunning and Kruger wrote, "to find individuals with an impressive understanding of the strategies and techniques of basketball, for instance, yet who could not 'dunk' to save their lives. (These people are called coaches.)" But of course coaches understand their own *physical* limitations. Similarly, "most people have no trouble identifying their inability to translate Slovenian proverbs, reconstruct a V-8 engine, or diagnose acute disseminated encephalomyelitis."

The Dunning–Kruger effect requires a minimal degree of knowledge and experience in the area about which you are ignorant (and ignorant of your ignorance). Drivers, as a group, are subject to the effect—bad drivers usually think they're good drivers—but those who have never learned how to drive are exempt.

Since Dunning and Kruger first published their results in the 1999 paper, "Unskilled and Unaware of It: How Difficulties in Recognizing One's Own Incompetence Lead to Inflated Self-Assessments," the effect named for them has become a meme. It strikes a universal chord: as Dunning put it, the overconfident airhead "is someone we've all met." The Ig Nobel Prize committee awarded the duo one of its satirical prizes in 2000. Actor John Cleese concisely explains the Dunning–Kruger effect in a much-shared YouTube video: "If you're very, very stupid, how can you possibly realize that you're very, very stupid? You'd have to be relatively intelligent to realize how stupid you are…And this explains not just Hollywood but almost the entirety of Fox News." The Dunning–Kruger effect is now part of the vocabulary of Internet snark (and some who think they know what it means don't quite get it). But the 1999 paper makes clear the authors' opinion that the first place to look for a Dunning–Kruger ignoramus is in the mirror.

The Knowledge

The first successful search engine took its name from a synonym for "noisy simpleton." In the mid-1990s, Yahoo introduced a world in which facts are accessible to all. A few keystrokes or spoken words summon a genie that lays almost any recorded fact at our feet. There was a time when bartenders were arbiters of debates over trivia relating to sports, sex, celebrities, and politics. Now customers whip out their phones or watches. Those alluring mobile devices have brought the cloud to the dining table, the gym, the backseat—and of course to the boardroom, the classroom, and the bedroom.

So why should we bother filling our heads with facts?

A case in point is the Knowledge, the notoriously difficult test required of London taxi drivers. As the guidebook for applicants explains:

> To achieve the required standard to be licensed as an "All London" taxi driver you will need a thorough knowledge, primarily, of the area within a six-mile radius of Charing Cross. You will need to know: all the streets; housing estates; parks and open spaces; government offices and departments; financial and commercial centres; diplomatic premises; town halls; registry offices; hospitals; places of worship; sports stadiums and leisure centres; airline offices; stations; hotels; clubs; theatres; cinemas; museums; art galleries; schools; colleges and universities; police stations and headquarters buildings; civil, criminal, and coroner's courts; prisons; and places of interest to tourists. In fact, anywhere a taxi passenger might ask to be taken.

There are twenty-five thousand streets to be learned within this six-mile radius. Not only that, the London taxi driver is also expected to be a living GPS, capable of promptly describing an efficient route between any two named points.

But change is in the air. In London, as in other big cities, the ride-sharing service Uber has disrupted the taxi business. It is safe to assume that your Uber driver will not have anything like the London taxi driver's vaunted Knowledge. It is equally safe to assume that the Uber driver will have Google Maps.

Is there any advantage to having a knowledgeable driver rather than one who simply defers to an app's turn-by-turn directions? That debate is currently raging. Taxi drivers and their supporters speak of the limitations and glitches of GPS navigation (as if human drivers never make a mistake). The subtext is that the Knowledge is another uniquely British tradition in danger of extinction.

It's not hard to guess how the story will end. Whether London bans ride-sharing apps or embraces them, whether change happens quickly or is drawn out for decades, at some point the digital juggernaut will prevail. Drivers for hire will cease memorizing city maps.

The outsourcing of knowledge to the digital commons is one of the grand narratives of the twenty-first century. Whatever your own professional knowledge is, the cloud already knows it or soon will. The network's knowledge will be more up to date than yours, and the network will be faster at retrieving it and better at drawing connections. What then?

The great twentieth-century fear was the fear of being replaced by a machine. The great twenty-first-century fear is the fear of being replaced by a lower-paid, less knowledgeable human augmented by a machine. In place of Knowledge, the low-paid human has McKnowledge—such as knowing how to use a GPS app. Tech enthusiasts say this kind of creative destruction is inevitable and ultimately good for all. They're right about the inevitable part. Sadly, there is no guarantee that inevitable changes produce the best of all possible worlds.

The Knowledge exam is a pure meritocracy, something still hard to come by in class-bound Britain. Class, race, religion, sex, and age don't matter. All that matters is knowing the streets. Though applicants may spend years studying for the exam, the outlay of time and money is usually much less than one would spend for a university education. A London taxi driver earns more than many graduates do and has the ability to set his or her own hours.

Uber's barriers to entry are a lot less stringent than that. "A lot less" also describes the earnings of Uber drivers. Driving for Uber is neither a career nor a vehicle of upward mobility. That is likely to remain true up until the inevitable day when Uber drivers find themselves replaced by self-driving cars.

Are You Smarter Than a Year One Student?

It's said that changing curricula is like moving a cemetery. Yet change does happen. In 2013 US schools dropped cursive writing from the

list of skills required of schoolchildren. Idaho state representative Linden Bateman was outraged. "Modern research indicates that more areas of the brain are engaged when children use cursive handwriting than when they keyboard," he said. "It's beyond belief to me that states have allowed cursive to slip from the standards." Bateman added that he wrote 125 cursive letters a year.

At seventy-two, Bateman was a bit older than the nation's schoolchildren. But he wasn't alone in his views. The curriculum change drew quick rebuke from…the nostalgia lobby? The objectors had enough pull in seven states, including California and Massachusetts, to get cursive written back into the state curricula.

The question is not whether cursive writing has some value. It's whether it's got *more* value than what could be taught in its place. Every hour spent teaching cursive writing is an hour not spent teaching something else.

An eternal dilemma of education is whether to teach facts or skills. At one extreme is rote memorization of multiplication tables, dates, and canons. At the other is an emphasis on critical thinking and skills (such as how to look up facts on the Internet, should you ever need a fact). When the issue is presented in this simplistic way, most of us lean towards the skills approach. Better to teach someone to fish than to supply a fish dinner.

"Should schoolchildren be taught the capital of Colombia?" In 2009 Kingston University journalism professor Brian Cathcart posed that question to David Fann, chair of the primary schools committee of Britain's National Association of Head Teachers. Fann's answer was a resounding no. "They just don't need to learn the capital cities of the world," he said. "The capital of France, yes, but not the capital of Colombia. They will be much better off learning to use atlases as a skill."

Fann's sentiment is an old one. Charles Dickens caricatured the Victorian method of teaching by rote in the character of Thomas Gradgrind, the flint-hearted headmaster of *Hard Times* (1854).

"Now, what I want is, Facts," Gradgrind says. "Teach these boys and girls nothing but Facts." In due course Gradgrind has an Ebenezer Scrooge-esque epiphany. He realizes that every fact is just another brick in the wall of education we don't need.

Dickens's novel (and Pink Floyd's rock opera) is half right. You can't justify the cost of one fact or brick to a Scrooge-ish auditor. Remove the brick, and the wall stands. Remove many bricks—not too many, not too close together—and still the wall stands.

The error is in projecting this too far—in thinking that you can dispense with *most* of the bricks. That would leave bricks hanging in mid-air. The wall collapses. The learner must acquire a critical mass of facts, permitting her a rough map of her knowledge and its gaps. Only then can she avoid the Dunning–Kruger fate of not knowing her own ignorance, and only then can she use Google to fill in the gaps.

Consider what it means to "look up" the capital of Colombia. That requires not just atlas-reading or Web-searching skills but also knowledge of a couple of facts:

1. There is a country called Colombia.
2. Almost every country has a capital.

Fact 1 is taught in school. Fact 2 is rarely stated explicitly, in school or anywhere else. It is a surmise that students make on their own, after learning of many countries and many capitals. Unless you know both 1 and 2, you're not going to know that there is a capital of Colombia to be looked up. In practice, facts and skills are not so readily disentangled. An educational programme that privileges either one too strongly risks running afoul of the way the learning mind operates.

The Common Core curriculum is a US initiative specifying standards for English and mathematics education. Its godfather was

E. D. Hirsch Jr, an English professor at the University of Virginia who felt that the anti-fact movement had overreached. He noticed that his students arrived lacking the basic cultural background that former generations of students had. Hirsch recalled his father, a Memphis cotton trader who dropped Shakespearean allusions into his business letters—allusions that were meaningful to fellow Memphis cotton traders.

Hirsch blamed an educational system that emphasized skills and "critical thinking" while slighting the teaching of facts. In many cases, children were being taught facts only as "for instances." Hirsch argued that facts *do* matter. He and his collaborators compiled a list of about five thousand persons, events, and ideas that they believed every educated person should know about. The list includes terms such as *gamma rays*, *rococo*, *absolute zero*, *faux pas*, and *penis envy.* These were, as Hirsch wrote, part of "the network of information that all competent readers possess…the background information, stored in their minds, that enables them to take up a newspaper and read it with an adequate level of comprehension, getting the point, grasping the implications, relating what they read to the unstated context which alone gives meaning to what they read."

Hirsch's list became the basis of his bestselling 1987 book, *Cultural Literacy: What Every American Needs to Know.* In it Hirsch cited an experiment: Harvard undergraduate Douglas Kingsbury asked Harvard Square passers-by, "How do you get to Central Square?" Most gave quick directions, like "First stop on the subway."

Kingsbury then assumed the guise of a tourist and said, "I'm from out of town. Can you tell me how to get to Central Square?" This time the answers were much longer.

> Yes, well, you go down on the subway. You can see the entrance over there, and when you get downstairs you buy

> a token, put it in the slot, and you go over to the side that says Quincy. You take the train headed for Quincy, but you get off very soon, just the first stop is Central Square, and be sure you get off there. You'll know it because there's a big sign on the wall. It says Central Square.

Without even thinking about it, everyone realized that a tourist would need more detailed directions. He would lack the shared points of reference; things that might be obvious to Bostonians would have to be spelled out. Kingsbury found that slipping into a Missouri accent could trigger the more detailed directions. Hirsch took that as evidence that shared points of cultural reference improve the ease and richness of communication, to everyone's benefit.

It's easy to buy Hirsch's basic argument; less clear is how far to take it. Hirsch's list is heavy on terms from ancient Greece and Rome, a civilization that lives on in figures of speech such as *mentor*, *platonic*, and *lesbian* (though an ancient Greek would be hard put to guess precisely how these terms are being used today). Still, you don't have to read Sophocles to know what these words mean.

Today few fret that the rising generation will miss classical allusions in Trollope or Thackeray. We're more likely to be puzzled by op-ed pieces referring to TV series that most have never seen; by Facebook posts alluding to micro-subcultures of food, music, politics, movies, and fashion. Is this a problem to worry about or just one of life's little anomalies?

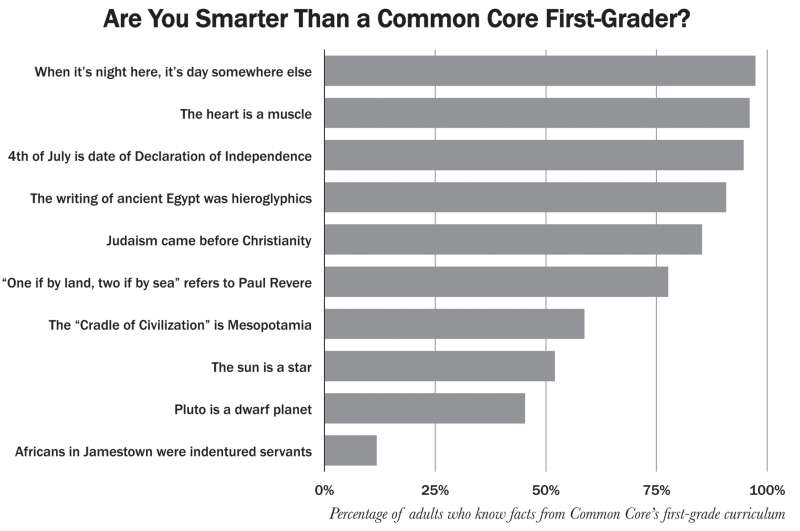
In any case, Hirsch's ideas remain influential (and controversial). They were the motivation behind the Common Core curriculum, now used by forty-two US states and the District of Columbia. To many American parents and politicians, *Common Core* are fighting words. Some have concluded that Common Core is an attempt to foist progressive curricula—including Darwin and the contributions of women and minorities—on the nation's less

progressive school districts. As South Carolina governor Nikki Haley put it, "We don't ever want to educate South Carolina children like they educate California children."

In reality Common Core is a rather innocuous set of guidelines prescribing the topics that should be taught at each grade level. For instance, Common Core's English Language Arts domains for first graders say that children should leave the first grade with the ability to:

- identify Mesopotamia as the "Cradle of Civilization";
- locate Egypt on a world map or globe and identify it as part of Africa;
- identify hieroglyphics as the system of writing used in ancient Egypt;
- explain that Christianity developed after Judaism;
- classify the sun as a star;
- explain that other parts of the world experience nighttime while we have daytime;
- classify Pluto as a dwarf planet;
- define the heart as a muscle that never stops working;
- identify "one if by land, two if by sea";
- explain that the first Africans in the English colonies came to Jamestown as indentured servants, not slaves; and
- explain the significance of the Fourth of July.

You may be saying, "Hold on, *that's* not Common Core. I saw this crazy homework assignment on Facebook…" Indeed, the words *Common Core* have morphed into an Internet meme. It is now the all-purpose hashtag for any bizarre homework assignment that turns up in the states that are using the guidelines. Of course, individual teachers create the homework, and inevitably a handful of them are loopy or just having a bad day. (No one ever posts *sensible*



homework assignments originating in the Common Core states.) The perception that Common Core is crazy is attributable to the selective reporting of our social networks. It is an object lesson in how information technologies can misinform.

One criticism of Common Core holds water, though: it is ambitious, perhaps unrealistically so, for many students. I conducted a survey testing American adults' knowledge of the first-grade items I just listed. The average adult could answer only seven of the ten questions.

To put the most optimistic spin on these results, American grown-ups have the night-here, day-there concept nailed. Perhaps we can forgive the fact that fewer than half of them got the memo about Pluto's demotion to a dwarf planet in 2006, an essentially semantic change that inspired a glut of media attention. It's harder to understand how half the public goes around not knowing that the sun is a star. That's not exactly breaking news.

Demonstrations of public ignorance are by now familiar; in fact, they're a staple of late-night comedy. For several years the Pew

Research Center has been polling the public with some general knowledge questions. A September 2010 Pew survey found that forty-one percent of adult Americans couldn't name the nation's vice president. Twenty percent said that lasers work by focusing sound waves—this was a true-false question. Fifty-eight percent didn't know the author of *Moby-Dick*, and four percent identified him as Stephen King (the question was multiple choice).

What Millennials Know

The Millennial generation is a bellwether for new ways of knowing—and not having to know. Loosely defined as people born from the early 1980s to the early 2000s, Millennials were the first generation to do homework by copying from Wikipedia instead of *World Book*; to get their news from *The Daily Show* or the Internet rather than the network news. If contemporary media have fried our collective brains, the damage ought to be most evident in Millennials.

Psychologists John Dunlosky and Katherine A. Rawson tested the general knowledge of 671 Kent State and Colorado State university students using a set of three hundred questions. Here are five of the questions they asked:

What is the last name of the author of *The Brothers Karamazov*?

What is the name of the mountain range that separates Europe from Asia?

What was the last name of the captain of the British ship *Bounty* when the mutiny occurred?

What is John Kenneth Galbraith's profession?

What is the last name of the leader whom Fidel Castro overthrew?

These are questions you might find in a trivia game promising fun for the whole family. Would you care to guess how many undergraduates could answer them?

Nobody. Not one single student, out of 671, could answer *any* of these five questions.

It should be emphasized that Millennials are the nation's most educated generation. But more education doesn't always mean more knowledge. That's the takeaway from a 2015 report prepared by the Educational Testing Service, the organization that creates the SATs. It compared the verbal, mathematical, and digital media skills and knowledge of Millennials in twenty-three nations. The British, Irish, and US scores were among the lowest in all categories. Canadian scores were somewhat better but below average.

The ETS broke out its findings into three figures: a national median, a tenth-percentile score (attained by those who scored just better than the worst ten percent of Millennials in each nation), and a ninetieth-percentile score (of those who just topped ninety percent of Millennials in each nation). This tripled the number of data points, but not one offered a salve to the English-speaking world's self-esteem.

America's least-informed ten percent were unparalleled in their ignorance, scoring lower than their peers in any other nation tested. The news was almost as grim for the ninetieth-percentile group. America's best and brightest outscored Spain's and were in a statistical dead heat with a few other nations. The highest-scoring US Millennials were still significantly behind those of the Slovak Republic, Norway, Japan, and Germany.

The ETS report concluded that:

> despite having the highest levels of educational attainment of any previous American generation, these young adults on average demonstrate relatively weak skills in literacy, numeracy, and problem solving in technology-rich

> environments compared to their international peers.… Equally troubling is that these findings represent a decrease in literacy and numeracy skills for US adults when compared with results from previous adult surveys.

No one really knows why American Millennials are falling behind. One hypothesis—though it's unproved—is that mobile devices are a factor. American Millennials are more likely to own smartphones than Millennials elsewhere. In 2014, eighty-six percent of Americans under thirty had a smartphone versus sixty-nine percent for China, forty-six percent for Russia, and twenty-five percent for Brazil. A smartphone puts the Internet's answers at your fingertips; for those growing up with such instant access, a re-evaluation of the importance of memorizing facts seems inevitable. In that sense, American Millennials could be the global future: less informed because there is less need to be informed.

My surveys confirm what others have found. Millennials don't know many facts that might be considered fundamental to cultural literacy. To give you some idea…

Most—more than fifty percent of—Millennials can't name anyone who shot a US president or discovered a planet; they don't know Socrates's most famous pupil (or the poison that killed Socrates); they can't say who wrote *The Canterbury Tales*, *A Streetcar Named Desire*, or *1984*; they can't name the palace built by Louis XIV or the Virginia estate of Thomas Jefferson; they are unable to supply the word for "deer meat" or "people who explore caves" or "the three-leaf clover that is the emblem of Ireland"; they can't identify the pop star who recorded "Heartbreak Hotel" and "All Shook Up" or the male or female leads of *Gone with the Wind* or *Casablanca*; they don't know the artists who painted *Guernica*, *The Persistence of Memory*, or *American Gothic*, or the escape artist who died of a ruptured appendix; they don't know who invented the telegraph, steamboat, radio, or phonograph; who proposed that the earth

moves around the sun, demonstrated that lightning is electricity, or formulated the theory of relativity; they can't name the brightest or second-brightest stars in the sky (that's the sun and Sirius, by the way); they can't name the largest ocean on earth, the longest river in South America, the city whose airport is Heathrow, or the mountain range that contains Mount Everest; they can't name the woman who discovered radium, the one who (in popular myth) designed and sewed the first American flag, or the Egyptian queen who allied with Mark Antony against Rome; they are unable to recognize Karl Marx, Queen Victoria, or Charles Dickens from a photograph; they can't identify the group of extinct creatures whose name means "terrible lizards," the big hairy spiders that are sometimes found in banana bunches, the deadly snake used by Indian snake charmers, or the furry animal that attacks this kind of snake; they draw a blank when asked for the capital of New York or the metal that is liquid at room temperature; they don't know what Frank Lloyd Wright did for a living; they can't name the captain of the *Pequod* in *Moby-Dick*, the ship of Charles Darwin's scientific voyage, the secret project that built the first atomic bomb, or the first artificial satellite; they don't know the ancient city celebrated for its hanging gardens, the one destroyed by Mount Vesuvius, or the emperor said to have fiddled while Rome burned; and most Millennials can't name the single word uttered by the raven in Edgar Allan Poe's poem.

Rational Ignorance

The conventional reaction to such reports is a blend of shock and amusement. It's terrible how little young people/ordinary citizens know—right? It's worth asking how we *know* it's so terrible and whether it's terrible at all.

Ignorance can be rational. Economist Anthony Downs made that claim in the 1950s. He meant that there are many situations