Chapter 3

THE CURSE OF KNOWLEDGE

THE MAIN CAUSE OF INCOMPREHENSIBLE PROSE IS THE DIFFICULTY OF IMAGINING WHAT IT’S LIKE FOR SOMEONE ELSE NOT TO KNOW SOMETHING THAT YOU KNOW

Why is so much writing so hard to understand? Why must a typical reader struggle to follow an academic article, the fine print on a tax return, or the instructions for setting up a wireless home network? The most popular explanation I hear is the one captured in this cartoon: 50 According to this theory, opaque prose is a deliberate choice. Bureaucrats and business managers insist on gibberish to cover their anatomy. Plaid-clad tech writers get their revenge on the jocks who kicked sand in their faces and the girls who turned them down for dates. Pseudo-intellectuals spout obscure verbiage to hide the fact that they have nothing to say. Academics in the softer fields dress up the trivial and obvious with the trappings of scientific sophistication, hoping to bamboozle their audiences with highfalutin gobbledygook. Here is Calvin explaining the principle to Hobbes:

Reprinted with permission of Universal Unclick. All rights reserved. I have long been skeptical of the bamboozlement theory, because in my experience it does not ring true. I know many scholars who have nothing to hide and no need to impress. They do groundbreaking work on important subjects, reason well about clear ideas, and are honest, down-to-earth people, the kind you’d enjoy having a beer with. Still, their writing stinks. People often tell me that academics have no choice but to write badly because the gatekeepers of journals and university presses insist on ponderous language as proof of one’s seriousness. This has not been my experience, and it turns out to be a myth. In Stylish Academic Writing (no, it is not one of the world’s thinnest books), Helen Sword masochistically analyzed the literary style in a sample of five hundred articles in academic journals, and found that a healthy minority in every field were written with grace and verve. 1 In explaining any human shortcoming, the first tool I reach for is Hanlon’s Razor: Never attribute to malice that which is adequately explained by stupidity. 2 The kind of stupidity I have in mind has nothing to do with ignorance or low IQ; in fact, it’s often the brightest and best informed who suffer the most from it. I once attended a lecture on biology addressed to a large general audience at a conference on technology, entertainment, and design. The lecture was also being filmed for distribution over the Internet to millions of other laypeople. The speaker was an eminent biologist who had been invited to explain his recent breakthrough in the structure of DNA. He launched into a jargon-packed technical presentation that was geared to his fellow molecular biologists, and it was immediately apparent to everyone in the room that none of them understood a word. Apparent to everyone, that is, except the eminent biologist. When the host interrupted and asked him to explain the work more clearly, he seemed genuinely surprised and not a little annoyed. This is the kind of stupidity I am talking about. Call it the Curse of Knowledge: a difficulty in imagining what it is like for someone else not to know something that you know. The term was invented by economists to help explain why people are not as shrewd in bargaining as they could be, in theory, when they possess information that their opposite number does 52 not. 3 A used-car dealer, for example, should price a lemon at the same value as a creampuff of the same make and model, because customers have no way to tell the difference. (In this kind of analysis, economists imagine that everyone is an amoral profit-maximizer, so no one does anything just for honesty’s sake.) But at least in experimental markets, sellers don’t take full advantage of their private knowledge. They price their assets as if their customers knew as much about their quality as they do. The curse of knowledge is far more than a curiosity in economic theory. The inability to set aside something that you know but that someone else does not know is such a pervasive affliction of the human mind that psychologists keep discovering related versions of it and giving it new names. There is egocentrism, the inability of children to imagine a simple scene, such as three toy mountains on a tabletop, from another person’s vantage point. 4 There’s hindsight bias, the tendency of people to think that an outcome they happen to know, such as the confirmation of a disease diagnosis or the outcome of a war, should have been obvious to someone who had to make a prediction about it before the fact. 5 There’s false consensus, in which people who make a touchy personal decision (like agreeing to help an experimenter by wearing a sandwich board around campus with the word REPENT) assume that everyone else would make the same decision. 6 There’s illusory transparency, in which observers who privately know the backstory to a conversation and thus can tell that a speaker is being sarcastic assume that the speaker’s naïve listeners can somehow detect the sarcasm, too. 7 And there’s mind blindness, a failure to mentalize, or a lack of a theory of mind, in which a three-year-old who sees a toy being hidden while a second child is out of the room assumes that the other child will look for it in its actual location rather than where she last saw it. 8 (In a related demonstration, a child comes into the lab, opens a candy box, and is surprised to find pencils in it. Not only does the child think that another child entering the lab will know it contains pencils, but the child will say that he himself knew it contained pencils all along!) Children mostly outgrow the inability to separate their own knowledge from someone else’s, but not entirely. Even adults slightly tilt their guess about where a person will look for a hidden object in the direction of where they themselves know the object to be. 9 Adults are particularly accursed when they try to estimate other people’s knowledge and skills. If a student happens to know the meaning of an uncommon word like apogee or elucidate, or the answer to a factual question like where Napoleon was born or what the brightest star in the sky is, she assumes that other students know it, too. 10 When experimental volunteers are given a list of anagrams to unscramble, some of which are easier than others because the answers were shown to them beforehand, they rate the ones that are easier for them (because they’d seen the answers) to be magically easier for everyone. 11 And when 53 experienced cell phone users were asked how long it would take novices to learn to use the phone, they guessed thirteen minutes; in fact, it took thirty-two. 12 Users with less expertise were more accurate in predicting the learning curves, though their guess, too, fell short: they predicted twenty minutes. The better you know something, the less you remember about how hard it was to learn. The curse of knowledge is the single best explanation I know of why good people write bad prose. 13 It simply doesn’t occur to the writer that her readers don’t know what she knows—that they haven’t mastered the patois of her guild, can’t divine the missing steps that seem too obvious to mention, have no way to visualize a scene that to her is as clear as day.\* And so she doesn’t bother to explain the jargon, or spell out the logic, or supply the necessary detail. The ubiquitous experience shown in this New Yorker cartoon is a familiar example: Anyone who wants to lift the curse of knowledge must first appreciate what a devilish curse it is. Like a drunk who is too impaired to realize that he is too impaired to drive, we do not notice the curse because the curse prevents us from noticing it. This blindness impairs us in every act of communication. Students in a team-taught course save their papers under the name of the professor who assigned it, so I get a dozen email attachments named “pinker.doc.” The professors rename the papers, so Lisa Smith gets back a dozen attachments named “smith.doc.” I go to a Web site for a trusted-traveler program and have to decide whether to click on 54 GOES, Nexus, Global Entry, Sentri, Flux, or FAST—bureaucratic terms that mean nothing to me. A trail map informs me that a hike to a waterfall takes two hours, without specifying whether that means each way or for a round trip, and it fails to show several unmarked forks along the trail. My apartment is cluttered with gadgets that I can never remember how to use because of inscrutable buttons which may have to be held down for one, two, or four seconds, sometimes two at a time, and which often do different things depending on invisible “modes” toggled by still other buttons. When I’m lucky enough to find the manual, it enlightens me with explanations like “In the state of {alarm and chime setting}. Press the [SET] key and the {alarm ‘hour’ setting} {alarm ‘minute’ setting} {time ‘hour’ setting} {time ‘minute’ setting} {‘year’ setting} {‘month’ setting} {‘day’ setting} will be completed in turn. And press the [MODE] key to adjust the set items.” I’m sure it was perfectly clear to the engineers who designed it. Multiply these daily frustrations by a few billion, and you begin to see that the curse of knowledge is a pervasive drag on the strivings of humanity, on a par with corruption, disease, and entropy. Cadres of expensive professionals—lawyers, accountants, computer gurus, help-line responders—drain vast sums of money from the economy to clarify poorly drafted text. There’s an old saying that for the want of a nail the battle was lost, and the same is true for the want of an adjective: the Charge of the Light Brigade during the Crimean War is only the most famous example of a military disaster caused by vague orders. The nuclear meltdown at Three Mile Island in 1979 has been attributed to poor wording (operators misinterpreted the label on a warning light), as has the deadliest plane crash in history, in which the pilot of a 747 at Tenerife Airport radioed he was at take off , by which he meant “taking off,” but an air traffic controller interpreted it as “at the takeoff position” and failed to stop him before he plowed his plane into another 747 on the runway. 14 The visually confusing “butterfly ballot” given to Palm Beach voters in the 2000 American presidential election led many supporters of Al Gore to vote for the wrong candidate, which may have swung the election to George W. Bush, changing the course of history. • • • How can we lift the curse of knowledge? The traditional advice—always remember the reader over your shoulder—is not as effective as you might think. 15 The problem is that just trying harder to put yourself in someone else’s shoes doesn’t make you a whole lot more accurate in figuring out what that person knows. 16 When you’ve learned something so well that you forget that other people may not know it, you also forget to check whether they know it. Several studies have shown that people are not easily disabused of their curse of knowledge, even 55 when they are told to keep the reader in mind, to remember what it was like to learn something, or to ignore what they know. 17 But imagining the reader over your shoulder is a start. Occasionally people do learn to discount their knowledge when they are shown how it biases their judgments, and if you’ve read to this point, perhaps you will be receptive to the warning. 18 So for what it’s worth: Hey, I’m talking to you. Your readers know a lot less about your subject than you think they do, and unless you keep track of what you know that they don’t, you are guaranteed to confuse them. A better way to exorcise the curse of knowledge is to be aware of specific pitfalls that it sets in your path. There’s one that everyone is at least vaguely aware of: the use of jargon, abbreviations, and technical vocabulary. Every human pastime —music, cooking, sports, art, theoretical physics—develops an argot to spare its enthusiasts from having to say or type a long-winded description every time they refer to a familiar concept in each other’s company. The problem is that as we become proficient at our job or hobby we come to use these catchwords so often that they flow out of our fingers automatically, and we forget that our readers may not be members of the clubhouse in which we learned them. Obviously writers cannot avoid abbreviations and technical terms altogether. Shorthand terms are unobjectionable, indeed indispensable, when a term has become entrenched in the community one is writing for. Biologists needn’t define transcription factor or spell out mRNA every time they refer to those things, and many technical terms become so common and are so useful that they eventually cross over into everyday parlance, like cloning, gene, and DNA. But the curse of knowledge ensures that most writers will overestimate how standard a term has become and how wide the community is that has learned it. A surprising amount of jargon can simply be banished and no one will be the worse for it. A scientist who replaces murine model with rats and mice will use up no more space on the page and be no less scientific. Philosophers are every bit as rigorous when they put away Latin expressions like ceteris paribus, inter alia, and simpliciter and write in English instead: other things being equal, among other things, and in and of itself. And though nonlawyers might assume that the language of contracts, such as the party of the first part, must serve some legal purpose, most of it is superfluous. As Adam Freedman points out in his book on legalese, “What distinguishes legal boilerplate is its combination of archaic terminology and frenzied verbosity, as though it were written by a medieval scribe on crack.” 19 Abbreviations are tempting to thoughtless writers because they can save a few keystrokes every time they have to use the term. The writers forget that the few seconds they add to their own lives come at the cost of many minutes stolen from the lives of their readers. I stare at a table of numbers whose columns are labeled DA DN SA SN, and have to flip back and scan for the explanation: Dissimilar 56 Affirmative, Dissimilar Negative, Similar Affirmative, Similar Negative. Each abbreviation is surrounded by many inches of white space. What possible reason could there have been for the author not to spell them out? Abbreviations that are coined for a single piece of writing are best avoided altogether, to spare the reader from having to engage in the famously tedious memory task called paired-associate learning, in which psychologists force their participants to memorize arbitrary pairs of text like DAX-QOV. Even moderately common abbreviations should be spelled out on first use. As Strunk and White point out, “Not everyone knows that SALT means Strategic Arms Limitation Talks, and even if everyone did, there are babies being born every minute who will someday encounter the name for the first time. They deserve to see the words, not simply the initials.” 20 The hazard is not limited to professional prose. Some of us receive annual Christmas letters in which the household spokesperson cheerily writes, “Irwin and I had a great time at the IHRP after dispatching the children to the UNER, and we all continue work on our ECPs at the SFBS.” A considerate writer will also cultivate the habit of adding a few words of explanation to common technical terms, as in “Arabidopsis, a flowering mustard plant,” rather than the bare “Arabidopsis” (which I’ve seen in many science articles). It’s not just an act of magnanimity: a writer who explains technical terms can multiply her readership a thousandfold at the cost of a handful of characters, the literary equivalent of picking up hundred-dollar bills on the sidewalk. Readers will also thank a writer for the copious use of for example, as in, and such as, because an explanation without an example is little better than no explanation at all. For example: Here’s an explanation of the rhetorical term syllepsis: “the use of a word that relates to, qualifies, or governs two or more other words but has a different meaning in relation to each.” Got that? Now let’s say I continue with “. . . such as when Benjamin Franklin said, ‘We must all hang together, or assuredly we shall all hang separately.’” Clearer, no? No? Sometimes two examples are better than one, because they allow the reader to triangulate on which aspect of the example is relevant to the definition. What if I add “. . . or when Groucho Marx said, ‘You can leave in a taxi, and if you can’t get a taxi, you can leave in a huff’”? 21 And when technical terms are unavoidable, why not choose ones that are easy for readers to understand and remember? Ironically, the field of linguistics is among the worst offenders, with dozens of mystifying technical terms: themes that have nothing to do with themes; PRO and pro, which are pronounced the same way but refer to different things; stage-level and individual-level predicates, which are just unintuitive ways of saying “temporary” and “permanent”; and Principles A, B, and C, which could just as easily have been called the Reflexive Principle, the Pronoun Principle, and the Noun Principle. For a long time I got a headache reading papers in semantics that analyzed the two meanings of some. In a loose, conversational sense, some implies “some, but not all”: when I say Some men are 57 chauvinists, it’s natural to interpret me as implying that others are not. But in a strict, logical sense, some means “at least one” and does not rule out “all”; there’s no contradiction in saying Some men are chauvinists; indeed, all of them are. Many linguists refer to the two meanings as the “upper-bounded” and “lower bounded” senses, labels borrowed from mathematics, and I could never keep them straight. At last I came across a limpid semanticist who referred to them as the “only” and “at-least” senses, labels from everyday English, and I’ve followed the literature ever since. This vignette shows that even belonging to the same professional club as a writer is no protection against her curse of knowledge. I suffer the daily experience of being baffled by articles in my field, my subfield, even my sub-sub-subfield. Take this sentence from an article I just read by two eminent cognitive neuroscientists, which appeared in a journal that publishes brief review articles for a wide readership: The slow and integrative nature of conscious perception is confirmed behaviorally by observations such as the “rabbit illusion” and its variants, where the way in which a stimulus is ultimately perceived is influenced by poststimulus events arising several hundreds of milliseconds after the original stimulus. After I macheted my way through the overgrowth of passives, zombies, and redundancies, I determined that the content of the sentence resided in the term “rabbit illusion,” the phenomenon which is supposed to demonstrate “the integrative nature of conscious perception.” The authors write as if everyone knows what the “rabbit illusion” is, but I’ve been in this business for nearly forty years and had never heard of it. Nor does their explanation enlighten. How are we supposed to visualize “a stimulus,” “poststimulus events,” and “the way in which a stimulus is ultimately perceived”? And what does any of this have to do with rabbits? Richard Feynman once wrote, “If you ever hear yourself saying, ‘I think I understand this,’ that means you don’t.” Though the article had been written for the likes of me, the best I could say after reading this explanation was, “I think I understand this.” So I did a bit of digging and uncovered a Cutaneous Rabbit Illusion, in which if you close your eyes and someone taps you a few times on the wrist, then on the elbow, and then on the shoulder, it feels like a string of taps running up the length of your arm, like a hopping rabbit. OK, now I get it—a person’s conscious experience of where the early taps fell depends on the location of the later taps. But why didn’t the authors just say that, which would have taken no more words than “stimulus this” and “poststimulus that”? 58 • • • The curse of knowledge is insidious, because it conceals not only the contents of our thoughts from us but their very form. When we know something well, we don’t realize how abstractly we think about it. And we forget that other people, who have lived their own lives, have not gone through our idiosyncratic histories of abstractification. There are two ways in which thoughts can lose their moorings in the land of the concrete. One is called chunking. Human working memory can hold only a few items at a time. Psychologists used to think that its capacity was around seven items (plus or minus two), but later downsized even that estimate, and today believe it is closer to three or four. Fortunately, the rest of the brain is equipped with a workaround for the bottleneck. It can package ideas into bigger and bigger units, which the psychologist George Miller dubbed “chunks.” 22 (Miller was one of the greatest stylists in the history of the behavioral sciences, and it’s no coincidence that he co-opted this homey term rather than inventing some technical jargon.) 23 Each chunk, no matter how much information is packed inside it, occupies a single slot in working memory. Thus we can hold in mind just a few of the letters from an arbitrary sequence like M D P H D R S V P C E O I H O P. But if they belong to well-learned chunks such as abbreviations or words, like the ones that pop out when we group the letters as MD PHD RSVP CEO IHOP, five chunks, we can remember all sixteen. Our capacity can be multiplied yet again when we package the chunks into still bigger chunks, such as the story “The MD and the PhD RSVP’d to the CEO of IHOP,” which can occupy just one slot, with three or four left over for other stories. Of course this magic depends on one’s personal history of learning. To someone who has never heard of the International House of Pancakes, IHOP takes up four slots in memory, not one. Mnemonists, the performers who amaze us by regurgitating superhuman amounts of information, have spent a lot of time building up a huge inventory of chunks in their long-term memories. Chunking is not just a trick for improving memory; it’s the lifeblood of higher intelligence. As children we see one person hand a cookie to another, and we remember it as an act of giving. One person gives another one a cookie in exchange for a banana; we chunk the two acts of giving together and think of the sequence as trading. Person 1 trades a banana to Person 2 for a piece of shiny metal, because he knows he can trade it to Person 3 for a cookie; we think of it as selling. Lots of people buying and selling make up a market. Activity aggregated over many markets gets chunked into the economy. The economy now can be thought of as an entity which responds to actions by central banks; we call that monetary policy. One kind of monetary policy, which involves the central bank buying private assets, is chunked as quantitative easing. And so on. As we read and learn, we master a vast number of these abstractions, and each 59 becomes a mental unit which we can bring to mind in an instant and share with others by uttering its name. An adult mind that is brimming with chunks is a powerful engine of reason, but it comes with a cost: a failure to communicate with other minds that have not mastered the same chunks. Many educated adults would be left out of a discussion that criticized the president for not engaging in more “quantitative easing,” though they would understand the process if it were spelled out. A high school student might be left out if you spoke about “monetary policy,” and a schoolchild might not even follow a conversation about “the economy.” The amount of abstraction that a writer can get away with depends on the expertise of her readership. But divining the chunks that have been mastered by a typical reader requires a gift of clairvoyance with which few of us are blessed. When we are apprentices in our chosen specialty, we join a clique in which, it seems to us, everyone else seems to know so much! And they talk among themselves as if their knowledge were second nature to every educated person. As we settle in to the clique, it becomes our universe. We fail to appreciate that it is a tiny bubble in a vast multiverse of other cliques. When we make first contact with the aliens in other universes and jabber at them in our local code, they cannot understand us without a sci-fi Universal Translator. Even when we have an inkling that we are speaking in a specialized lingo, we may be reluctant to slip back into plain speech. It could betray to our peers the awful truth that we are still greenhorns, tenderfoots, newbies. And if our readers do know the lingo, we might be insulting their intelligence by spelling it out. We would rather run the risk of confusing them while at least appearing to be sophisticated than take a chance at belaboring the obvious while striking them as naïve or condescending. It’s true that every writer must calibrate the degree of specialization in her language against her best guess of the audience’s familiarity with the topic. But in general it’s wiser to assume too little than too much. Every audience is spread out along a bell curve of sophistication, and inevitably we’ll bore a few at the top while baffling a few at the bottom; the only question is how many there will be of each. The curse of knowledge means that we’re more likely to overestimate the average reader’s familiarity with our little world than to underestimate it. And in any case one should not confuse clarity with condescension. Brian Greene’s explanation of the multiverse in chapter 2 shows how a classic stylist can explain an esoteric idea in plain language without patronizing his audience. The key is to assume that your readers are as intelligent and sophisticated as you are, but that they happen not to know something you know. Perhaps the best way to remember the dangers of private abbreviation is to recall the joke about a man who walks into a Catskills resort for the first time and sees a group of retired borscht-belt comics telling jokes around a table with their pals. One of them calls out, “Forty-seven!” and the others roar with laughter. 60 Another follows with “A hundred and twelve!” and again the others double over. The newcomer can’t figure out what’s going on, so he asks one of the old-timers to explain. The man says, “These guys have been hanging around together so long they know all the same jokes. So to save time they’ve given them numbers, and all they need to do is call out the number.” The new fellow says, “That’s ingenious! Let me try it.” So he stands up and calls out, “Twenty-one!” There is a stony silence. He tries again: “Seventy-two!” Everyone stares at him, and nobody laughs. He sinks back into his seat and whispers to his informant, “What did I do wrong? Why didn’t anyone laugh?” The man says, “It’s all in how you tell it.” • • • A failure to realize that my chunks may not be the same as your chunks can explain why we baffle our readers with so much shorthand, jargon, and alphabet soup. But it’s not the only way we baffle them. Sometimes wording is maddeningly opaque without being composed of technical terminology from a private clique. Even among cognitive scientists, “poststimulus event” is not a standard way to refer to a tap on the arm. A financial customer might be reasonably familiar with the world of investments and still have to puzzle over what a company brochure means by “capital changes and rights.” A computer-savvy user trying to maintain his Web site might be mystified by instructions on the maintenance page which refer to “nodes,” “content type,” and “attachments.” And heaven help the sleepy traveler trying to set the alarm clock in his hotel room who must interpret “alarm function” and “second display mode.” Why do writers invent such confusing terminology? I believe the answer lies in another way in which expertise can make our thoughts more idiosyncratic and thus harder to share: as we become familiar with something, we think about it more in terms of the use we put it to and less in terms of what it looks like and what it is made of. This transition, another staple of the cognitive psychology curriculum, is called functional fixity (sometimes functional fixedness). 24 In the textbook experiment, people are given a candle, a book of matches, and a box of thumbtacks, and are asked to attach the candle to the wall so that the wax won’t drip onto the floor. The solution is to dump the thumbtacks out of the box, tack the box to the wall, and stick the candle onto the box. Most people never figure this out because they think of the box as a container for the tacks rather than a physical object in its own right, with handy features like a flat surface and perpendicular sides. The blind spot is called functional fixity because people get fixated on an object’s function and forget its physical makeup. The toddler who ignores the birthday present and plays with the wrapping paper reminds us of how we lose our appreciation of objects as objects and think of them as means to an end. Now, if you combine functional fixity with chunking, and stir in the curse that 61 hides each one from our awareness, you get an explanation of why specialists use so much idiosyncratic terminology, together with abstractions, metaconcepts, and zombie nouns. They are not trying to bamboozle us; that’s just the way they think. The mental movie of a mouse cowering in the corner of a cage that has another mouse in it gets chunked into “social avoidance.” You can’t blame the neuroscientist for thinking this way. She’s seen the movie thousands of times; she doesn’t need to hit the PLAY button in her visual memory and watch the critters quivering every time she talks about whether her experiment worked. But we do need to watch them, at least the first time, to appreciate what actually happened. In a similar way, writers stop thinking—and thus stop writing—about tangible objects and instead refer to them by the role those objects play in their daily travails. Recall the example from chapter 2 in which a psychologist showed people sentences, followed by the label TRUE or FALSE. He explained what he did as “the subsequent presentation of an assessment word,” referring to the label as an “assessment word” because that’s why he put it there—so that the participants in the experiment could assess whether it applied to the preceding sentence. Unfortunately, he left it up to us to figure out what an “assessment word” is—while saving no characters, and being less rather than more scientifically precise. In the same way, a tap on the wrist became a “stimulus” and a tap on the elbow became a “poststimulus event,” because the writers cared about the fact that one event came after the other and no longer cared about the fact that the events were taps on the arm. But we readers care. We are primates, with a third of our brains dedicated to vision, and large swaths devoted to touch, hearing, motion, and space. For us to go from “I think I understand” to “I understand,” we need to see the sights and feel the motions. Many experiments have shown that readers understand and remember material far better when it is expressed in concrete language that allows them to form visual images, like the sentences on the right: 25 The set fell off the table. The ivory chess set fell off the table. The measuring gauge was covered with dust. The oil-pressure gauge was covered with dust. Georgia O’Keeffe called some of her works “equivalents” because their forms were abstracted in a way that gave the emotional parallel of the source experience. Georgia O’Keeffe’s landscapes were of angular skyscrapers and neon thoroughfares, but mostly of the bleached bones, desert shadows, and weathered crosses of rural New Mexico. Notice how the abstract descriptions on the left leave out just the kind of physical detail that an expert has grown bored with but that a neophyte has to see: ivory chessmen, not just a “set”; an oil-pressure gauge, not just a generic “measuring gauge”; bleached bones, not just “forms.” A commitment to the concrete does more than just ease communication; it can lead to better reasoning. A reader who knows 62 what the Cutaneous Rabbit Illusion consists of is in a position to evaluate whether it really does imply that conscious experience is spread over time, or whether it can be explained in some other way. The profusion of metaconcepts in professional writing—all those levels, issues, contexts, frameworks, and perspectives—also makes sense when you consider the personal history of chunking and functional fixity in the writers. Academics, consultants, policy wonks, and other symbolic analysts really do think about “issues” (they can list them on a page), “levels of analysis” (they can argue about which is most appropriate), and “contexts” (they can use them to figure out why something works in one place but not in another). These abstractions become containers in which they store and handle their ideas, and before they know it they can no longer call anything by its name. Compare the professionalese on the left with the concrete equivalents on the right: Participants were tested under conditions of good to excellent acoustic isolation. We tested the students in a quiet room. Management actions at and in the immediate vicinity of airports do little to mitigate the risk of off-airport strikes during departure and approach. Trapping birds near an airport does little to reduce the number of times a bird will collide with a plane as it takes off or lands. We believe that the ICTS approach to delivering integrated solutions, combining effective manpower, canine services and cutting-edge technology was a key differentiator in the selection process. They chose our company because we protect buildings with a combination of guards, dogs, and sensors. What we see as “a quiet room” an experimenter sees as “testing conditions,” because that’s what she was thinking about when she chose the room. For a safety expert at the top of the chain of command, who lives every day with the responsibility for managing risks, the bird traps set out by her underlings are a distant memory. The public-relations hack for a security firm refers to the company’s activities in a press statement in terms of the way she thinks about them when selling them to potential clients. Slicing away the layers of familiar abstraction and showing the reader who did what to whom is a never-ending challenge for a writer. Take the expository chore of describing a correlation between two variables (like smoking and cancer, or videogame playing and violence), which is a staple of public-health and social-science reporting. A writer who has spent a lot of time thinking about correlations will have mentally bubble-wrapped each of the two variables, and will have done the same to the possible ways in which they can be correlated. Those verbal packages are all within arm’s reach, and she will naturally turn to them when she has to share some news: There is a significant positive correlation between measures of food intake and 63 body mass index. Body mass index is an increasing function of food intake. Food intake predicts body mass index according to a monotonically increasing relation. A reader can figure this out, but it’s hard work, like hacking through a blister pack to get at the product. If the writer de-thingifies the variables by extracting them from their noun casings, she can refer to them with the language we use for actions, comparisons, and outcomes, and everything becomes clearer: The more you eat, the fatter you get. The curse of knowledge, in combination with chunking and functional fixity, helps make sense of the paradox that classic style is difficult to master. What could be so hard about pretending to open your eyes and hold up your end of a conversation? The reason it’s harder than it sounds is that if you are enough of an expert in a topic to have something to say about it, you have probably come to think about it in abstract chunks and functional labels that are now second nature to you but still unfamiliar to your readers—and you are the last one to realize it. • • • As writers, then, we should try to get into our readers’ heads and be mindful of how easy it is to fall back on parochial jargon and private abstractions. But these efforts can take us only so far. None of us has, and few of us would want, a power of clairvoyance that would expose to us everyone else’s private thoughts. To escape the curse of knowledge, we have to go beyond our own powers of divination. We have to close the loop, as the engineers say, and get a feedback signal from the world of readers—that is, show a draft to some people who are similar to our intended audience and find out whether they can follow it. 26 This sounds banal but is in fact profound. Social psychologists have found that we are overconfident, sometimes to the point of delusion, about our ability to infer what other people think, even the people who are closest to us. 27 Only when we ask those people do we discover that what’s obvious to us isn’t obvious to them. That’s why professional writers have editors. It’s also why politicians consult polls, why corporations hold focus groups, and why Internet companies use A/B testing, in which they try out two designs on a Web site (versions A and B) and collect data in real time on which gets more clicks. Most writers cannot afford focus groups or A/B testing, but they can ask a roommate or colleague or family member to read what they wrote and comment on 64 it. Your reviewers needn’t even be a representative sample of your intended audience. Often it’s enough that they are not you. This does not mean you should implement every last suggestion they offer. Each commentator has a curse of knowledge of his own, together with hobbyhorses, blind spots, and axes to grind, and the writer cannot pander to all of them. Many academic articles contain bewildering non sequiturs and digressions that the authors stuck in at the insistence of an anonymous reviewer who had the power to reject it from the journal if they didn’t comply. Good prose is never written by a committee. A writer should revise in response to a comment when it comes from more than one reader or when it makes sense to the writer herself. And that leads to another way to escape the curse of knowledge: show a draft to yourself, ideally after enough time has passed that the text is no longer familiar. If you are like me you will find yourself thinking, “What did I mean by that?” or “How does this follow?” or, all too often, “Who wrote this crap?” I am told there are writers who can tap out a coherent essay in a single pass, at most checking for typos and touching up the punctuation before sending it off for publication. You are probably not one of them. Most writers polish draft after draft. I rework every sentence a few times before going on to the next, and revise the whole chapter two or three times before I show it to anyone. Then, with feedback in hand, I revise each chapter twice more before circling back and giving the entire book at least two complete passes of polishing. Only then does it go to the copy editor, who starts another couple of rounds of tweaking. Too many things have to go right in a passage of writing for most mortals to get them all the first time. It’s hard enough to formulate a thought that is interesting and true. Only after laying a semblance of it on the page can a writer free up the cognitive resources needed to make the sentence grammatical, graceful, and, most important, transparent to the reader. The form in which thoughts occur to a writer is rarely the same as the form in which they can be absorbed by a reader. The advice in this and other stylebooks is not so much on how to write as on how to revise. Much advice on writing has the tone of moral counsel, as if being a good writer will make you a better person. Unfortunately for cosmic justice, many gifted writers are scoundrels, and many inept ones are the salt of the earth. But the imperative to overcome the curse of knowledge may be the bit of writerly advice that comes closest to being sound moral advice: always try to lift yourself out of your parochial mindset and find out how other people think and feel. It may not make you a better person in all spheres of life, but it will be a source of continuing kindness to your readers.