

Condensing

Brevity is the soul of wit.

—SHAKESPEARE, *Hamlet*

The Project Description may not exceed 15 pages.

—NATIONAL SCIENCE FOUNDATION GRANT PROPOSAL GUIDE

Shakespeare had it right: good writing is tight and sleek, giving you what you need with just enough extra to create flow and highlight. Bloated writing is bad writing.

For a scientist, writing compact English goes beyond being an act of style. It is an act of success or maybe survival. Papers rarely have a page limit, but when your ideas are buried in words, cumbersome sentences, and extraneous information, readers get confused and frustrated, potentially leading to extra rounds of revision or outright rejection. Proposals invariably do have strict page limits. The National Science Foundation won't look at a proposal that goes one word over 15 pages, but my first drafts are never under 18. Somehow those 18 pages *must* squeeze down into 15. How do you do that?

There are two approaches to condensing. The first is to tighten up your ideas and language. That's a skill which takes time to develop. But if you don't develop

it, the only alternative is formatting tricks: using a smaller font, packing hypotheses into paragraphs instead of bulleted lists, and shrinking figures to the point you need a magnifying glass to read them. Though this does force all the words onto 15 pages, they end up looking like figure 16.1—a dense mass that a reader has to struggle through to figure out whether the ideas are worthwhile. Don't

Figure 16.1 is a blurred page from a densely packed proposal. The text is extremely dense and difficult to read, illustrating the negative consequences of poor condensing techniques. The page is filled with long, complex sentences and a high density of words, making it nearly impossible to discern the main ideas. The text is a single paragraph that appears to be a technical description of a scientific experiment or process. The language is highly specialized and jargon-heavy, further contributing to the difficulty of reading. The overall effect is one of a cluttered and overwhelming document that fails to communicate its message effectively. This is a stark contrast to the clear and concise writing advocated in the preceding pages of the book.

Figure 16.1. A blurred page from a densely packed proposal.

think we don't notice. We may forgive you, but it's a hurdle to enlisting us as your advocate.

Some people who write like this argue that they have too much to say and can't condense the writing. Rubbish. I've *never* read something that looked like figure 16.1 where I couldn't streamline the ideas or condense the language without cutting substantive content. Never. Inevitably dense or densely packed writing means the author lacked either the skill or the inclination to condense, not that it couldn't be done. And they pay a price for it—rejection. By skipping the time to streamline your writing, you may feel that you are saving time, but in fact, you are squandering it.

16.1. A STRATEGY FOR CONDENSING

To write concisely, in *Writing Tools*, Roy Peter Clark gives the advice of “Prune the big limbs, then shake out the dead leaves.” He elaborates by saying that “brevity comes from selection, not compression, a lesson that requires lifting blocks from the work.”

“Prune, then shake” is excellent advice. First figure out what you don't need to say; then, don't say it. That's the “prune the big limbs” part. It grows directly from SUCCES and figuring out your simple story. Once you've figured out the story, you should be able to identify what information to include. The rest goes. I discussed this in chapter 3 (SUCCES) and chapter 8 (e.g., figure 8.1).

The next step is shaking out the dead leaves. That means cutting unnecessary words from the pieces that stay. Your first step should be to compact your ideas by building good story arcs. Broken arcs are inefficient. When you discuss an idea in multiple places, you almost always repeat things. Cleaning up the arcs lets you eliminate the repeats and the words used in transitions. Figure 10.2 illustrated how when there are three complete arcs, there are only 2 internal transitions, but when those arcs were fragmented, there were 13. In chapter 13, I pointed out how linking ideas and developing flow often requires adding words. Unnecessary transitions create waste.

After eliminating unnecessary material and condensing story arcs, the last step is to work with the delete key. Each word should do work; it should add content, clarify meaning, or provide coherence. Yet in almost every document, some words are slackers—empty adjectives, redundant modifiers, and other types of filler.

Most of us include a lot of filler. Stephen King¹ describes the best advice he ever got as “Formula: second draft = first draft – 10 percent.” I count on trimming 20 percent from my first drafts. In learning to squeeze proposals into 15 pages, I even developed a game to help: look at every paragraph that has a word or two hanging on a bottom line and figure out how to cut enough to pull them up into the body of the paragraph. Killing one word may save a whole line.

1. Stephen King *On Writing*. Scribner; 1st edition (October 3, 2000), Kindle Edition.

Score! This helped me develop skill as a literary trash compactor and to identify several targets for the delete key:

- Redundancies
- Obvious
- Modifiers: adjectives and adverbs
- Metadiscourse
- Verbosity

16.2. REDUNDANCIES

Sometimes we use several words where one does all the work that needs doing. The next three examples illustrate this.

Example 16.1

I will develop, test, and apply a new synthetic approach to produce photovoltaic plastics.

Testing is part of developing, whereas “synthetic” and “produce” both refer to making things. So this sentence could easily read:

“I will develop a new approach to produce photovoltaic plastics.”

Example 16.2

Most, but not all of the test subjects responded.

“Most” means “the majority” and so, “not all.” This sentence could be written:

“Most of the test subjects responded.”

Example 16.3

The effectiveness of these antibodies in HIV infection provides a proof-of-principle for the feasibility of using engineered antibodies as a novel therapy.

A proof-of-principle implies feasibility, so this can be condensed to:

“The effectiveness of these antibodies in HIV infection suggests the feasibility of using engineered antibodies as a novel therapy.”

Often we repeat ideas in multiple sentences, in which case collapsing redundancy means collapsing sentences together. Sometimes we can delete an entire sentence, but often there is an idea, a few words, to capture.

Example 16.4

The altered precipitation patterns associated with global warming will change the water regimes of most ecosystems, particularly those with arid, semi-arid, and Mediterranean climates. These dry environments currently comprise one third of the terrestrial land surface.

Neither of these sentences is bad, but this can be collapsed down to:

"Climate change will alter the water regimes of most ecosystems, particularly those in arid and semi-arid regions, which comprise roughly one third of the land surface."

The original is two sentences because the authors' first was complex, so they appropriately put how much of the land is dry in a separate sentence. But most of the first sentence's complexity can be collapsed to two words: climate change. Readers understand that includes both warming *and* altered precipitation; mentioning altered water regimes reinforces that. Simplifying the first sentence allowed me to integrate the important point of the second into it and eliminate the transition words "These dry environments." I deleted "Mediterranean" because it is a type of semi-arid climate, and it was only fleshing out the list. If the Mediterranean climate were specifically important, it would be highlighted.

16.3. OBVIOUS

Obvious is close kin to redundant, as both encompass words that offer no useful information. The difference is that whereas redundancies duplicate information within a passage, obvious ideas are well known or implied and so don't need to be said anywhere.

Example 16.5

There is evidence that X17-production can be associated with enzyme induction (Chu et al. 2008).

If there weren't evidence for the statement, the author wouldn't have said it, and there certainly wouldn't be a literature reference. So "There is evidence that" is obvious and can be deleted.

"X-17 production can be associated with enzyme induction (Chu et al. 2008)."

The author probably included the caveat "There is evidence" to suggest that this finding is not confirmed. But the word *can* adds that caveat all by itself. If this were an unequivocal statement, they would have written "X-17 production is associated . . ."

Example 16.6

Snow cover is a characteristic of high alpine ecosystems that is critical in regulating both plant community dynamics and hydrology.

It's obvious that snow cover is a "characteristic" and alpine ecosystems are defined by being "high," so we can delete those and adjust a few words to fit the new structure:

"Snow cover in alpine ecosystems is critical in regulating both plant community dynamics and hydrology."

Example 16.7

The greatest challenge in dealing with the crisis of a pandemic is that it is global in scope and so public health responses must operate across national borders.

Two things define a pandemic: the disease is highly infectious and very widespread. Ergo, it is a crisis, and almost certain to be international. So, we can leave those ideas implicit without losing information:

"The greatest challenge in dealing with a pandemic is that public health responses must operate across national borders."

16.4. MODIFIERS: ADVERBS AND ADJECTIVES

Write with nouns and verbs. . . . The adjective hasn't been built that can pull a weak or inaccurate noun out of a tight place.

—STRUNK AND WHITE, *The Elements of Style*

The Adverb is not your friend.

—STEPHEN KING, "On Writing"

Adjectives modify nouns, and adverbs modify everything else (including adjectives). But good words don't need modifying. Strong, clear nouns and verbs give writing power, a power you can't match by decorating weak words. Eliminating unnecessary adjectives and adverbs will make your writing stronger and tighter.

Example 16.8

The entire reaction sequence takes less than one hour to complete.

Do you need both "entire" and "complete"? You could easily and condense this to:

"The reaction sequence takes less than one hour to complete."

You could even go further: *"The reaction sequence takes less than one hour."*

Example 16.9 illustrates using an adverb unsuccessfully to make a point.

Example 16.9:

The treatment dramatically increased X.

The author added "dramatically" to highlight that the increase in X was large. It doesn't work. "Dramatically" is fuzzy and doesn't carry much meaning—was the increase a factor of 2, 20, or 200? Without the concrete information on how much the treatment increased X, the adverb is weak. You could add that information:

"The treatment dramatically increased X by a factor of 42."

But if you know the increase was by a factor of 42, then it is obvious that the increase was dramatic. So just write:

"The treatment increased X by a factor of 42."

These examples illustrate what I call "empty amplifiers." They try to intensify the word they are referring to but don't add meaning (see table 16.1 for more). Empty amplifiers take up space but do no harm. If you delete them, the important thought remains. Take "dramatically" away from "dramatically increased X," and X still increased. Take "quite" away from "quite large" and you're still left with something big.

Modifiers can be more insidious than these empty amplifiers: they can hide empty thoughts. Sometimes when you strip away the modifiers, you find that there isn't a lot of substance left, as illustrated in example 16.10.

Example 16.10

The immune system uses a highly effective control mechanism that efficiently discriminates between self and nonself.

Table 16.1. EMPTY AMPLIFIERS: ADJECTIVES AND ADVERBS THAT TRY TO INTENSIFY THEIR REFERENT BUT ADD NO MEANING

With an "ly" these are adverbs; without "ly" they are adjectives.

Certain(ly)	Quite	Substantial(ly)
Dramatic(ally)	Rather	Very
Entire(ly)	Real(ly)	
High(ly)	Simple(ly)	

This sentence uses two adverbs and an adjective to emphasize how good a job the immune system does: it is both "highly effective" and discriminates "efficiently." If you delete those words, you are left with:

"The immune system uses a control mechanism that discriminates between self and nonself."

Without the modifiers, this sentence feels like it's missing something. We know what the immune system does, but this sentence could be rewritten to become more focused and concrete. What is the control mechanism? How is it efficient? That information may follow, but it should have been here.

This sentence replaced substance with hype and hoped we wouldn't notice. But decoration can never replace content. This sentence reminds me of the time I went to buy my father a bottle of Scotch for his birthday, and the guy at the store tried to sell me a simple blended in a cut-glass bottle, instead of the 25-year-old Macallan in a plain one.

This example was the opening for a story, setting up the picture that the authors fill in by illustrating how wonderful the control system is. So maybe it wasn't terrible, but it was an empty pawn push; the paper would be stronger with a queen launch that offered some intellectual meat.

Another example of using adjectives to create the sense that the author is saying something substantive is example 16.11.

Example 16.11

Thermal stress induces structural and functional changes in GTH-7.

Adding "structural and functional" appears to say something about the nature of the changes. But these encompass all possible types of change, changes that almost inevitably go together. So this really adds no concrete information. Deleting this phrase collapses the sentence to: "Thermal stress induces changes in GTH-7."

As with the previous example, this now seems like it doesn't say enough—it begs the question "what kind of changes?" But that question highlights the emptiness of "structural and functional." What we really want to know is the specific nature of those changes, and you're sure to tell us in the following sentences. Instead, integrate them into this one to make one tight sentence: "Thermal stress alters the conformation of GTH-7's active site, reducing its affinity for GXP."

16.4.1. Good Modifiers

The adjectives and adverbs I've discussed mostly reinforce the word they refer to and don't do enough useful work to justify their existence. However, some words don't just reinforce but clarify or define their referent. To illustrate, let's return to a modification of example 16.8. In the following, you could not delete the adjective "first."

Example 16.12

The first phase of the reaction sequence takes less than one hour to complete.

"First" distinguishes one phase of the reaction sequence from others; it provides essential information.

Some modifiers, rather than amplifying, alter the meaning of their referent. These are powerful. To illustrate this, Roy Peter Clark uses the example of "she smiled happily" versus "she smiled sadly." We expect smiles to be happy, so "happily" is an empty amplifier. We don't expect smiles to be sad, so "sadly" transforms the image entirely.²

A direct scientific parallel would be the difference between a "final result" and a "preliminary result." We assume results are final, so calling something a "final result" is wasting words. Describing something as a "preliminary result" suggests it's still tentative, a distinction that may be important. You could delete "final" but not "preliminary."

16.5. METADISCOURSE: TALKING ABOUT WHAT YOU'RE DOING

We often include some description of our actions and thoughts, rather than limiting our words strictly to the material at hand. For example:

We found that . . .

We argue that . . .

Our initial hypothesis was that . . .

These data may indicate . . .

To conclude . . .

This is known as metadiscourse—discussing the discussion. Some metadiscourse is necessary to develop the flow of an argument, but it can be obvious or redundant. Consider the following examples.

Example 16.13

We found that aniline did not react with . . .

These are new data, first reported in your paper—could someone else have found it? So write: "Aniline did not react with . . ."

2. You can argue that "entirely" here is an empty amplifier, but I like how it sounds and works. I want "transforms" as an active verb that directly follows its subject, but I also want to pull the idea of "transforms" into the stress. Putting the adverb in the stress achieves this. Remember: rules are guidelines.

Example 16.14

"In this study, we measured Y . . ."

This is a common expression but if you say "We measured Y," it's obvious that it was in this study. Going back to the idea of good adjectives, though, if you measured Y in a *previous* study, you would need to specify that: "In a previous study, we measured Y."

Avoiding unnecessary metadiscourse also eliminates concern about whether you should discuss your own actions in the active or passive voice. Some still object to saying "we found that aniline did not react" and insist on using the passive, leading to the cumbersome "aniline was not found to react." Eliminating the metadiscourse sidesteps the issue and produces text that is shorter and cleaner as well: "Aniline did not react."

16.6. VERBOSITY

I include verbosity as a separate category, but it is really the sum of multiple types of filler, creating sentences that ramble on endlessly. Verbose authors are often insecure, afraid to make a definitive statement, or can't separate their own mental processes from the story they are trying to tell. Example 16.15 is a particularly egregious case.

Example 16.15

The data show that some enhancement in the applicability of these measurements can be accomplished with freeze-fracture prior to analysis by laser-ablation mass spectrometry.

It's hard to characterize the junk that has been piled on this sentence, but if you cut it all out, the original 25-word sentence condenses to 11: "Freeze-fracture pretreatment improved analyses by laser-ablation mass spectrometry."

That is an example where the writing was awful and loaded with obese words. But verbose writing doesn't have to be terrible. Here is an example where the authors were trying to limit how much they packed into any single sentence.

Example 16.16

Maximizing the yield of X requires both optimizing the pH and selecting an appropriate catalyst. The optimum pH range is narrow, between 4.5 and 5, while appropriate catalysts include Mn and Fe.

This is structured as an LD story, with the first sentence describing the general conditions and the second detailing them. That would be fine if that detailing took an entire paragraph. But it doesn't. This can be cut in half: "Maximizing the yield of X requires a pH in the range of 4.5 to 5 and either a Mn or Fe catalyst."

16.7. VERBS AND ACTION

I mentioned in chapter 14 that active verbs are tight, while passives, fuzzies, and nominalizations are not—they require extra words. Putting the action into verbs is a powerful tool for condensing writing. As a reminder, I offer example 16.17.

Example 16.17

Agents that can interfere with the binding of AS2 protein to DNA are capable of delaying the onset of ovarian cancer.

By converting all the actions to verbs, this sentence becomes both shorter and stronger: “Agents that interfere with AS2 protein’s binding to DNA can delay the onset of ovarian cancer.”

16.8. A FULL PARAGRAPH EXAMPLE

The following paragraph is 260 words and I don’t think it’s terrible. I think it may be representative of decent first draft writing.

Example 16.18

A central dogma of ecology has long been that soil microorganisms must decompose organic matter, releasing inorganic N, before that N becomes available for plants to take up. In the arctic tundra, however, several lines of evidence have forced us to question the importance of microbial decomposition and inorganic N uptake by plants: 1) In these soils, microbes appear to take up enough inorganic N during the growing season that they leave inadequate supplies of N to support the N uptake needed to sustain measured plant growth. 2) The total annual net release of inorganic N by microbes is often half the value that is required to meet the demands of plant uptake, as estimated from plant harvests over the course of the growing season. 3) Several tundra plant species have been shown in lab studies to be able to take up amino acids from hydroponic solution, and can use the N to support growth. While these studies suggest that plants should take up amino acids and possibly other forms of organic N in the field, they do not provide conclusive evidence of this. Rather, amino acids are an excellent source of both C and N for soil microorganisms, which might be expected to outcompete plants for any free amino acids in natural soils, thus limiting the access of plants to these compounds. If tundra plants take up a significant amount of their N directly as amino acids, we must reevaluate our basic view of the central role of microbial breakdown of organic N to NH_4^+ in the tundra N-cycle.³

How much can we condense here without losing meaning? Let’s work through it sentence by sentence.

3. This is adapted from early drafts of several proposals I have written.

~~A central dogma of ecology~~ *Ecological dogma* has long been that soil microorganisms must decompose organic matter, releasing inorganic N, before that N becomes available for plants to take up.

Dogma is always “central,” and implies long duration, so we can tighten the opening. Plants don’t do anything else but take N up, do they? Obvious.

In the arctic tundra, however, several lines of evidence *challenge this*. ~~have forced us to question the importance of microbial decomposition and inorganic-N uptake by plants.~~

I deleted the metadiscourse, and instead of reiterating the decomposition/uptake concept, I encapsulated it in “this.”

The next two sentences relate to microbial processes but would be unclear to a reader who is not a tundra ecologist. In the tundra, microbes take up inorganic N during the summer but release it during the winter. The distinction between “growing season uptake” and “total annual release,” however, might be unclear to other readers. It needs to be either clearer or unsaid. The important point is that soil microbes don’t release enough inorganic N to support plant growth—that is what challenges the dogma. So capture the best parts of each weak sentence to make one strong one.

~~1) In these soils, Microbes appear to take up enough inorganic N during the growing season that they leave inadequate supplies of N to support the N uptake needed to sustain measured plant growth. 2) The total annual net release of inorganic N by microbes is often half the value that is required to meet the demands of plant uptake, as estimated from plant harvests over the course of the growing season.~~

1) Microbes release only half the inorganic N required to support measured plant growth.

I took the idea of “plant growth” from the first sentence, because it is a stronger concept than “demands of plant uptake,” but I took the core message from the second—it was stronger.

~~3) 2) Several tundra plant species have been shown in lab studies to be able to can take up and grow on amino acids from hydroponic solution, and can use the N to support growth.~~

This was unnecessary detail that would be in a reference. I eliminated the metadiscourse “have been shown” and collapsed the detailed explanation into the simple “can.”

While these studies suggest that plants ~~should take up amino acids and possibly other forms of~~ use organic N in the field, they ~~do not provide are not~~ conclusive evidence of this.

By condensing “amino acids and other forms of organic N,” to “organic N” I kept the important distinction of inorganic versus organic N. Condensing sharpens that message. In the last clause I cut the nominalization “conclusive evidence” to leave “conclusive” in the stress position.

Rather, amino acids are an excellent source of both C and N for soil microorganisms, which ~~might be expected to~~ *should* outcompete plants for them. ~~any free amino acids in natural soils, thus limiting the access of plants to these compounds.~~

The last phrase was implied—if microbes outcompete plants for amino acids, they necessarily limit plant access to them. This phrase may sound like it's adding information, but it isn't.

If tundra plants take up a significant amount of their N ~~directly as~~ amino acids, we must reevaluate ~~our basic view of the central role of microbial breakdown of organic N to NH_4^+ in the tundra N-cycle.~~

Since we are reevaluating it, it is necessarily “our basic view.” Nature doesn't change as a result of research—only our perception of it does. This is unnecessary metadiscourse. “Central” is an empty adjective. Now let's look at this condensed paragraph.

Ecological dogma has been that soil microorganisms must decompose organic matter, releasing inorganic N, before that N becomes available for plants. In the arctic tundra, however, several lines of evidence challenge this: 1) Microbes release only half the inorganic N required to support measured plant growth. 2) Several tundra plant species can take up and grow on amino acids. While these studies suggest that plants use organic N in the field, they are not conclusive. Rather, amino acids are an excellent source of C and N for soil microorganisms, which should outcompete plants for them. If tundra plants take up a significant amount of amino acids, we must reevaluate the role of microbial breakdown of organic N to NH_4^+ in the tundra.

This is only 122 words: over 50 percent reduction with no loss of information. Because it carries less baggage, the message shines brighter.

16.9. CONDENSING TO CLARIFY

Sometimes you're faced with text that feels long and wordy but is also confusing. Often, the best way to clarify the message is to start by stripping away the excess to bring into focus what the text says (or doesn't say). Once you can see the message, it's easier to sharpen. As an example, consider the following passage.

Example 16.19

In the modern era of genomics, access to whole-genome sequence data is critical, but inadequate for the purpose of analyzing networks of physiological processes. The challenge is to effectively assimilate whole-genome sequence data based on objectively defined criteria in ways that facilitate interpretations and biological assessments.

The reaction most people have to this is simply: “Huh? What does that mean?” Is that reaction because the ideas are complex? Or because the language is? I argue the latter. This passage is rife with problems, including a massive deficiency of verbs (only four; can you find them?) and a surfeit of nominalizations. It violates almost every rule on word choice—so much so that the message is buried. To clarify, we can start by stripping this down to its bones. I underscore everything I think is filler and discuss it in the table.

In the modern era of genomics, access to whole-genome sequence data is critical, but inadequate for the purpose of analyzing networks of physiological processes. The challenge is to effectively assimilate whole-genome sequence data based on objectively defined criteria in ways that facilitate interpretations and biological assessments.

In the modern era of genomics	We know what era we're in—this is cliché and pompous. It's also a prepositional phrase.
purpose of analyzing	Verbose, nominalized way of saying “to analyze”
networks of physiological processes	Redundant and a prepositional phrase. Physiology implies process. This can be condensed to “physiological networks.”
effectively	Empty adjective: of course we want to assimilate data effectively.
whole-genome sequence data	Repeats this phrase.
based on objectively defined criteria	Implied—we assume that criteria are objectively defined unless specified otherwise.
Assessments	Since we don't know what kind of assessments, this says nothing

If we clear all this away, this collapses down to the following, which is roughly 40 percent shorter.

Access to whole-genome sequence data is critical, but inadequate for analyzing physiological networks. The challenge is to assimilate the data in ways that facilitate biological interpretation.

A little work with the delete key improved this substantially. Not only is the point starting to emerge, but the writing feels more alive. By cutting clutter, it increased the verb-to-word ratio to 4 out of 27, a comfortable number. Doing this also exposes the second problem with this piece: most actions are nominalized.

1. What are the actions?

Access to whole-genome sequence data is critical, but inadequate for analyzing physiological networks. The challenge is to assimilate the data in ways that facilitate biological interpretation.

2. Where are the verbs?

Access to whole-genome sequence data is critical, but inadequate for analyzing physiological networks. The challenge is to assimilate the data in ways that facilitate biological interpretation.

The only actions that are verbs are “to assimilate” and “facilitate,” and they are heavy Latin words that don’t show action. The other actions are nominalized. These problems make the writing longer and more confusing. It is also depersonalized: to whom are the data critical? Who is challenged? There is no “old lady screaming” anywhere in this passage. To make this more compelling, we can put the action into verbs and use active voice.

To analyze physiological networks, we need whole-genome sequence data, but such data alone are inadequate. The challenge is to assimilate them in ways that allow better biological interpretations.

This now puts the actor, “we,” in the topic position and follows immediately with the action verb: “need.” Real people are going to analyze these networks, and those people are us; because the data are critical, *we* need them. I shortened “facilitate” to the lighter “allow.” I could, perhaps, have shortened “assimilate” to “use,” but when modelers talk about assimilating data into models it implies a suite of specific mathematical tools, whereas “use” does not. This is actually two words/three characters longer than the previous, but it reads more easily. It is much shorter and more intelligible than the original.

16.10. WHEN NOT TO KILL EVERY POSSIBLE WORD

In this chapter, I focused on how to cut every unnecessary word. You should apply those text-squishing tools to everything you write. There are, however, two caveats to these guidelines. First, especially if you are working with coauthors, it’s alright to be a little verbose in your first drafts. It’s easy to strip down overloaded writing. It’s harder to go in the other direction and fill in the gaps in underloaded writing, which can be cryptic and disjointed. To figure out what is missing, you need to know the data and the story well. Advisors and coauthors, however,

rarely know the story as well as you do, and they don’t know what is in your head. Don’t be afraid to give them enough that their main work will be trimming.

Second, words that build flow and coherence are not unnecessary. Any word that helps your readers understand your message does useful work. That is why I voted for keeping “entirely” in my discussion of empty amplifiers in section 16.5.1. To further illustrate the value of a few extra words to build flow, compare the following two pieces.

Example 16.20

- A. Writing can get stripped down to the point that it becomes barren.
Some filler can add flow, so use it, but carefully.
- B. Writing can get too barren. Filler can add flow. Use it carefully.

I like the first. It’s longer, but it reads well. The second is painful.

Learn to put your writing through the trash compactor. Once you have done that, work on finding the golden balance between over- and underloaded, between bloated and cryptic. When you hit that point, your writing will be tight and sleek, with grace, style, and power.

EXERCISES

16.1. Write a short article

Take your short article and condense it by at least 10 percent. In chapter 2, I suggested that the article should be between 800 and 850 words. Now it should be between 720 and 765 words. If you can go shorter, see how much shorter you can go.

Edit your partners’ articles and edit the down at least 10 percent. See whether you would all suggest the same edits.

16.2. Edit: condense the following

- A. Polyaromatic hydrocarbons and polychlorinated biphenyls are challenging to remediate: it costs a lot of money and it threatens the health of workers who are exposed to the compounds.
- B. When expression of *Chla* and *Chlb* were compared, similar patterns of transcript abundance were observed in plants at different developmental stages.
- C. Inherent resistance is an evolved response to living in environments that are constantly harsh. Inherent resistance doesn’t require a plant to induce any specific physiological mechanism in response to an imposed stress. Rather plants that are inherently resistant are characterized by traits such as high root biomass, extensive chemical defenses, and relatively low maximum potential growth rates.