

SCENARIO

As a new project engineer for the state highway department, you were asked—well, told, really—to be part of a team that was writing a new policy and procedure memorandum (PPM). The purpose of the PPM was to increase citizen participation in highway planning. The team spent an afternoon discussing the PPM and its purpose. The team leader, Chief Engineer Rosenberg, asked you to have a written purpose statement ready for the next meeting. “It will give us a good start for our next discussion,” he said.

That night, you gave up watching your favorite TV shows to write the statement and have ready it for the next day. You wanted to be sure the statement covered everything and would be taken seriously by its readers. Of course, you also wanted it to impress Chief Engineer Rosenberg. By midnight you were satisfied with your statement:

The purpose of this PPM (Policy and Procedure Memorandum) is to ensure, to the maximum extent practicable, that highway locations and designs reflect and are consistent with federal, state, and local goals and objectives. The rules, policies, and procedures established by this PPM are intended to afford full opportunity for effective public participation in the consideration of highway location and design proposals before submission to the federal Department of Transportation for approval. They provide a medium for free and open discussion and are designed to encourage early and amicable resolution of controversial issues that may arise.

At the next day’s meeting the chief was impressed all right, but in the wrong way. He read your statement aloud, and said, “A bit on the pompous side, don’t you think?” He then proceeded to rewrite the statement. You had to admit that his version was easier to read and understand.

This chapter discusses the principles the chief used to achieve clarity and avoid pomposity.

chapter 5

Achieving a Readable Style

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Choosing a Style for International Readers

A readable text is one that an intended reader can comprehend without difficulty. Many things can make a text difficult to read. For example, the content may include unexplained concepts that the reader does not understand. Material that is new to the reader may not be explained in terms of material already familiar to the reader. The material may not be arranged or formatted in a way to make it accessible to the reader. We cover such aspects of readability elsewhere, notably in Chapter 2, Composing, Chapter 4, Writing for Your Readers, and Chapter 11, Document Design. In this chapter, we deal with style elements at the paragraph, sentence, and word level that can make your text clearer and more readable.

Examples of unclear writing style are all too easy to find, even in places where we would hope to find clear, forceful prose. Read the following sentence:

While determination of specific space needs and access cannot be accomplished until after a programmatic configuration is developed, it is apparent that physical space is excessive and that all appropriate means should be pursued to assure that the entire physical plant is utilized as fully as feasible.

This murky sentence comes from a report issued by a state higher education coordinating board. Actually, it's better than many examples we could show you. Although difficult, the sentence is probably readable. Others are simply indecipherable. When you have finished this chapter, you should be able to analyze a passage like the one just cited and show why it is so unclear. You should also know how to keep your own writing clear, concise, and vigorous. We

discuss paragraphs, lists, clear sentence structure, specific words, and pomposity. We have broken our subject into five parts for simplicity's sake, but all the parts are closely related. All have one aim: readability.

If there is a style checker in your word processor, it will incorporate many of the principles we discuss in this chapter. Nevertheless, use it with great care. Style checkers used without understanding the principles involved in good style can be highly misleading. (We discuss style checkers and problems associated with them more fully in Chapter 2, Composing.)

THE PARAGRAPH

In Chapters 9 and 10, we discuss various ways to arrange information, such as exemplification, narration, and description. Any of these arrangement strategies may be used not only to develop reports but also to develop paragraphs within reports. This short paragraph uses exemplification:

Until recently, virtually all medical products had terrestrial sources. For example, organisms found in all soil have yielded products such as penicillin, amoxicillin, and other antibiotic compounds responsible for saving millions of Americans from suffering and death.¹

The following longer paragraph depends on narration:

The body starts to form most of its bone mass before puberty, the beginning of sexual development, building 75 to 85 percent of the skeleton during adolescence. Women reach their peak bone mass by around 25 to 30, while men build bone mass until about age 30 to 35. The amount of peak bone mass you reach depends largely on your genes. Then, gradually, with age, the breakdown outpaces the buildup, and in late middle age bone density lessens when needed calcium is withdrawn from bone for such tasks as blood clotting and muscle contractions, including beating by the heart.²

Thus, paragraphs vary in arrangement and length, depending on their purpose and content, but a mark of a well-written paragraph is clear organization around a central statement.

The Central Statement

In technical writing, the central statement of a paragraph more often than not appears at the beginning of the paragraph. This placement provides the clarity of of statement that good technical writing must have. In a paragraph aimed at persuasion, however, the central statement may appear at the close, where it provides a suitable climax for the argument. Wherever you place the central

statement, you can achieve unity by relating all the other details of the paragraph to the statement, as in this paragraph of fact and speculation:

The central statement concerning Yellowstone National Park is underlined. The rest of the paragraph presents facts and speculation in support of the central statement.

The Earth's crust beneath Yellowstone National Park is still restless. Precise surveys have detected an area in the center of the caldera that rose by as much as 86 centimeters between 1923 and 1984 and then subsided slightly between 1985 and 1989. Scientists do not know the cause of these ups and downs but hypothesize that they are related to the addition or withdrawal of magma beneath the caldera, or to the changing pressure of the hot ground water system above Yellowstone's large magma reservoir. Also, Yellowstone National Park and the area immediately west of the park are historically among the most seismically active areas in the Rocky Mountains. Small-magnitude earthquakes are common beneath the entire caldera, but most are located along the Hebgen Lake fault zone that extends into the northwest part of the caldera. A magnitude 7 earthquake occurred along this zone in 1959.³

Paragraph Length

Examination of well-edited magazines such as *Scientific American* reveals that their paragraphs seldom average more than a hundred words in length. Magazine editors know that paragraphs are for the reader. Paragraphing breaks the material into related subdivisions to enhance the reader's understanding. When paragraphs are too long, the central statements that provide the generalizations needed for reader understanding are either missing or hidden in the mass of supporting details.

In addition to considering the reader's need for clarifying generalizations, editors also consider the psychological effect of their pages. They know that large blocks of unbroken print have a forbidding appearance that intimidates the reader. If you follow the practice of experienced editors, you will break your paragraphs whenever your presentation definitely takes a new turn. As a general rule, paragraphs in reports and articles should average one hundred words or fewer. In letters and memorandums, because of their page layout, you should probably hold average paragraph length to fewer than sixty words.

Transitions

Generally, a paragraph presents a further development in a continuing sequence of thought. In such a paragraph, the opening central statement will be so closely related to the preceding paragraph that it will provide a sufficient transition. When

a major transition between ideas is called for, consider using a short paragraph to guide the reader from one idea to the next.

The following four paragraphs provide an excellent example of paragraph development and transition:

Repetition of the key word *fossil* provides transition throughout the passage. The first sentence expresses the passage's central theme: Fossils provide clues to the past. In the second paragraph, the phrase "will tell even more" alerts readers that the paragraph will examine another role for fossils. The next sentence clarifies that role: to reveal the former boundaries between ancient lands and seas. The third paragraph's central statement looks both backward and forward, first summarizing the preceding paragraph and then announcing yet another role for fossils: to provide information about the temperature of ancient seas. The final paragraph rounds off the passage by summarizing its main points.

The distribution of fossils (skeletons, shells, leaf impressions, footprints and dinosaur eggs) in rocks of a certain age tells something about the ancient distribution of lands and seas on the Earth's surface. The remains of coral and clamshells found in the very old limestones in parts of Pennsylvania and New York indicate that this region was once covered by a shallow sea. Similarly, the remains of ancestral horses and camels in rocks of South Dakota show that the area was then dry land or that land was nearby.

A closer look at these fossils will tell even more. Their distribution identifies the ancient areas of land and sea and also determines the approximate shoreline. The distribution of living forms shows that thick-shelled fossil animals once lived in shallow seas close to shore, where their shells were built to withstand the surging and pounding of waves. Thin-shelled, delicate fossil animals probably lived in deeper, calmer water offshore.

In addition to providing a measure of water depth, fossils can also be used to indicate the former temperature of water. In order to survive, certain types of present-day coral must live in warm and shallow tropical saltwaters, such as the seas around Florida and the Bahamas. When similar types of coral are found in the ancient limestones, they provide a good estimate of the marine environment that must have existed when they were alive.

All these factors—depth, temperature, currents, and salinity—that are revealed by fossils are important, for each detail tends to sharpen and clarify the picture of ancient geography.⁴

The four paragraphs illustrate that you will develop paragraphs coherently when you keep your mind on the central theme. If you do so, the words needed to provide proper transition will come naturally. More often than not, your transitions will be repetitions of key words and phrases, supported by such simple expressions as *also*, *another*, *of these four*, *because of this development*, *so*, *but*, and *however*. When you wander away from your central theme, no amount of artificial transition will wrench your writing back into coherence.

LISTS AND TABLES

One of the simplest things you can do to ease the reader's chore is to break down complex statements into lists. Visualize the printed page. When it appears as an unbroken mass of print, it intimidates readers and makes it harder for them to pick out key ideas. Get important ideas out into the open where they stand out. Lists help to clarify introductions and summaries. You may list by (1) starting each separate point on a new line, leaving plenty of white space around it, or (2) using numbers within a line, as we have done here. Examine the following summary from a student paper, first as it might have been written and then as it actually was:

The exploding wire is a simple-to-perform yet very complex scientific phenomenon. The course of any explosion depends not only on the material and shape of the wire but also on the electrical parameters of the circuit. In an explosion the current builds up and the wire explodes, current flows during the dwell period, and "postdwell conduction" begins with the reignition caused by impact ionization. These phases may be run together by varying the circuit parameters.

Now, the same summary as a list:

The exploding wire is a simple-to-perform yet very complex scientific phenomenon. The course of any explosion depends not only on the materials and shape but also on the electrical parameters of the circuit.

An explosion consists primarily of three phases:

1. The current builds up and the wire explodes.
2. Current flows during the dwell period.
3. "Postdwell conduction" begins with the reignition caused by impact ionization.

These phases may be run together by varying the circuit parameters.

The first version is clear, but the second version is clearer, and readers can now file the process in their minds as “three phases.” They will remember it longer.

Some writers avoid using lists even when they should use them, so we hesitate to suggest any restrictions on the practice. Obviously, there are some subjective limits. Lists break up ideas into easy-to-read, easy-to-understand bits, but too many can make your page look like a laundry list. Also, some journal editors object to lists in which each item starts on a separate line. Such lists take space, and space costs money. Use lists when they clarify your presentation, but use them prudently.

Tables perform a function similar to lists. You can use them to present a good deal of information—particularly statistical information—in a way that is easy for the reader to follow and understand. We discuss tables and their functions in Chapter 12, Using Illustrations.

CLEAR SENTENCE STRUCTURE

The basic English sentence structure follows two patterns, *subject-verb-object* (SVO) and *subject-verb-complement* (SVC):

Americans(S) love(V) ice cream(O).
She(S) planned(V) carefully(C).

Around such simple sentences as “Americans love ice cream” the writer can hang a complex structure of words, phrases, and clauses that modify and extend the basic idea. In this case, the writer actually wrote “Americans love ice cream, but ice cream is made from whole milk and cream and therefore contains a considerable amount of saturated fat and dietary cholesterol.”

In this section on clear sentence structure, we discuss how to extend your sentences without losing clarity. We discuss sentence length, sentence order, sentence complexity and density, active verbs, active and passive voice, and first-person point of view.

Sentence Length

Many authorities have seen sentence length as an indicator of how difficult a sentence is. More recent research has found that although sentence length and word length may be indicators, they are not the primary causes of difficulty in reading sentences. Rather, the true causes may be the use of difficult sentence structures and words unfamiliar to the reader. This position is summed up well in this statement:

A sentence with 60, 100, or 150 words needs to be shortened; but a sentence with 20 words is not necessarily more understandable than a sentence with 25 words. The incredibly long sentences that are sometimes found in technical, bureaucratic, and legal writing are also sentences that have abstract nouns as subjects, buried actions, unclear focus, and intrusive phrases. These are the problems that must be fixed, whether the sentence has 200 words or 10.

Similarly, short words are not always easier words. The important point is not that the words be short, but that your readers know the words you are using.⁵

In general we agree with such advice. Sentence density and complexity cause readers more grief than does sentence length alone. Nevertheless, it's probably worth keeping in mind that most professional writers average only slightly more than twenty words per sentence. Their sentences may range from short to fairly long, but, for the most part, they avoid sentences like this one from a bank in Houston, Texas:

You must strike out the language above certifying that you are not subject to backup withholding due to notified payee underreporting if you have been notified that you are subject to backup withholding due to notified payee underreporting, and you have not received a notice from the Internal Revenue Service advising you that backup holding has terminated.

Sentence Order

What is the best way to order a sentence? Is a great deal of variety in sentence structure the mark of a good writer? One writing teacher, Francis Christensen, looked for the answers to those two questions. He examined large samples from twenty successful writers, including John O'Hara, John Steinbeck, William Faulkner, Ernest Hemingway, Rachel Carson, and Gilbert Highet. In his samples, he included ten fiction writers and ten nonfiction writers.⁶

What Christensen discovered seems to disprove any theory that good writing requires extensive sentence variety. The writers whose work was examined depended mostly on basic sentence patterns. They wrote 75.5 percent of their sentences in plain **subject-verb-object (SVO)** or **subject-verb-complement (SVC)** order, as in these two samples:

Doppler radar increases capability greatly over conventional radar. (SVO)
Doppler radar can be tuned more rapidly than conventional radar. (SVC)

Another 23 percent of the time, the professionals began sentences with short **adverbial openers**:

Like any radar system, Doppler does have problems associated with it.

These adverbial openers are most often simple prepositional phrases or single words such as *however*, *therefore*, *nevertheless*, and other conjunctive adverbs. Generally, they provide the reader with a transition between thoughts. Following the opening, the writer usually continues with a basic SVO or SVC sentence.

These basic sentence types—*SVO(C)* or *adverbial + SVO(C)*—were used 98.5 percent of the time by the professional writers in Christensen’s sample. What did the writers do with the remaining 1.5 percent of their sentences? For 1.2 percent, they opened the sentence with **verbal clauses** based on participles and infinitives such as “*Breaking* ground for the new church” or “*To see* the new pattern more clearly.” The verbal opener was again followed most often with an SVO or SVC sentence, as in this example:

Looking at it this way, we see the radar set as basically a sophisticated stopwatch that sends out a high-energy electromagnetic pulse and measures the time it takes for part of that energy to be reflected back to the antenna.

Like the adverbial opener, the verbal opener serves most of the time as a transition.

The remaining 0.3 percent of the sentences (about one sentence in three hundred) were **inverted constructions**, in which the subject is delayed until after the verb, as in this sentence:

No less important to the radar operator are the problems caused by certain inherent characteristics of radar sets.

What can we conclude from Christensen’s study? Simply this: Professional writers are interested in getting their content across, not in tricky word order. They convey their thoughts in clear sentences not clouded by extra words. You should do the same.

Sentence Complexity and Density

Research indicates that sentences that are too complex in structure or too dense with content are difficult for many readers to understand.⁷ Basing our observations on this research, we wish to discuss four particular problem areas: openers in front of the subject, too many words between the subject and the verb, noun strings, and multiple negatives.

Openers in Front of the Subject As Christensen’s research indicates, professional writers place an adverbial or verbal opener before their subjects

about 25 percent of the time. When these openers are held to a reasonable length, they create no problems for readers. The problems occur when the writer stretches such openers beyond a reasonable length. What is *reasonable* is somewhat open to question and depends to an extent on the reading ability of the reader. However, most would agree that the twenty-seven words and five commas before the subject in the following sentence make the sentence difficult to read:

Opening phrase too dense

Because of their ready adaptability, ease of machining, and aesthetic qualities that make them suitable for use in landscape structures such as decks, fences, steps, and retaining walls, preservative-treated timbers are becoming increasingly popular for use in landscape construction.

The ideas contained in this sentence become more accessible when spread over two sentences:

Puts central idea before supporting evidence

Preservative-treated timbers are becoming increasingly popular for use in landscape construction. Their ready adaptability, ease of machining, and aesthetic qualities make them highly suited for use in structures such as decks, fences, steps, and retaining walls.

The second version has the additional advantage of putting the central idea in the sequence before the supporting information.

The conditional sentence is a particularly difficult type of sentence in which the subject is too long delayed. You can recognize the conditional by its *if* beginning:

Subject too long delayed

If heat [20–35°C (or 68–95°F)-optimum], moisture (20%1 moisture content in wood), oxygen, and food (cellulose and wood sugars) are present, spores will germinate and grow.

To clarify such a sentence, move the subject to the front and the conditions to the rear. Consider the use of a list when you have more than two conditions:

List helps to clarify

Spores will germinate and grow when the following elements are present:

- Heat [20–35°C (or 68–95°F) optimum]
- Moisture content (20%1 moisture content in wood)
- Oxygen
- Food (cellulose and wood sugars)

Words between Subject and Verb In the following sentence, too many words between the subject and the verb cause difficulty:

Subject and verb too widely separated

Creosote, a brownish-black oil composed of hundreds of organic compounds, usually made by distilling coal tar, but sometimes made from wood or petroleum, has been used extensively in treating poles, piles, cross-ties, and timbers.

The sentence is much easier to read when it is broken into three sentences and first things are put first:

Revised

Creosote has been used extensively in treating poles, piles, cross-ties, and timbers. It is a brownish-black oil composed of hundreds of organic compounds. Creosote is usually made by distilling coal tar, but it can also be made from wood or petroleum.

You might break down the original sentence into only two sentences if you felt your audience could handle denser sentences:

Revised

Creosote, a brownish-black oil composed of hundreds of organic compounds, has been used extensively in treating poles, piles, cross-ties, and timbers. It is usually made by distilling coal tar, but it can also be made from wood or petroleum.

Noun Strings Noun strings are another way in which writers sometimes complicate and compress their sentences beyond tolerable limits. A noun string is a sequence of nouns that modifies another noun; for example, in the phrase *oxidization filtration process*, the nouns *oxidization* and *filtration* modify *process*. Sometimes the string may also include an adjective, as in *special oxidization filtration process*.

Nothing is grammatically wrong with the use of nouns as modifiers. Such use is an old and perfectly respectable custom in English. Expressions such as *firefighter* and *creamery butter*, in which the modifiers are nouns, go virtually unnoticed. The problem occurs when writers string many nouns together in one

sequence or use many noun strings in a passage, as shown in this paragraph (Italics added):

Six noun strings in one paragraph

We must understand who the initiators of *water-oriented greenway* efforts are before we can understand the basis for *community environment decision making* processes. *State government planning* agencies and commissions and *designated water quality planning and management* agencies have initiated such efforts. They have implemented *water resource planning and management* studies and have aided *volunteer group greenway initiators* by providing technical and coordinative assistance.⁸

In many such strings, the reader has great difficulty in sorting out the relationships among the words. In *volunteer group greenway initiators*, does *volunteer* modify *group* or *initiators*? The reader has no way of knowing.

The solution to untangling difficult noun strings is to include relationship clues such as prepositions, relative pronouns, commas, apostrophes, and hyphens. For instance, a hyphen in *volunteer-group* indicates that *volunteer* modifies *group*. The strung-out passage just quoted was much improved by the inclusion of such clues:

Relationship clues help to clarify noun strings

We must understand who the initiators of efforts to promote water-oriented greenways are before we can understand the process by which a community makes decisions about environmental issues. Planning agencies and commissions of the state government and agencies that have been designated to plan and manage water quality have initiated such efforts. They have implemented studies on planning and managing water resources and have aided volunteer groups that initiate efforts to promote greenways by providing them with technical advice and assistance in coordinating their activities.⁹

The use of noun strings in technical English will no doubt continue. They do have their uses, and technical people are very fond of them, but avoid using them excessively. When you do use them, check to be sure you are clear.

Multiple Negatives Writers introduce excessive complexity into their sentences by using multiple negatives. By *multiple negative*, we do not mean the grammatical error of the *double negative*, as in “He does *not* have *none* of them.” We are talking about perfectly correct constructions that include two or more negative expressions, such as these:

Negative statements

- We will not go unless the sun is shining.
- We will not pay except when the damages exceed \$50.
- The lever will not function until the power is turned on.

The positive versions of all of these statements are clearer than the negative versions:

Positive statements

- We will go only if the sun is shining.
- We will pay only when the damages exceed \$50.
- The lever functions only when the power is turned on.

Research shows that readers have difficulty sorting out passages that contain multiple negatives. If you doubt the research, try your hand at interpreting this government regulation (italics added):

Excessive use of negatives

§928.310 Papaya Regulation 10. Order. (a) *No* handler shall ship any container of papayas (*except* immature papayas handled pursuant to §928.152 of this part): (1) During the period January 1 through April 15, 1980, to any destination within the production area *unless* said papayas grade at least Hawaii No. 1, *except* that allowable tolerances for defects may total 10 percent. Provided, that *not* more than 5 percent shall be for serious damage, *not* more than 1 percent for immature fruit, not more than 1 percent for decay: Provided further, that such papayas shall individually weigh *not* less than 11 ounces each.¹⁰

Active Verbs

The verb determines the structure of an English sentence. Many sentences in technical writing falter because the finite verb does not comment on the subject, state a relationship about the subject, or relate an action that the subject performs. Look at the following sentence:

Action in a noun

Protection of the external corners is accomplished by a metal strip.

English verbs can easily be changed into nouns, but sometimes, as we have just seen, the change can lead to a faulty sentence. The writer has put the true action into the subject and subordinated the metal strip into the object of a preposition. The sentence should read:

Action in a verb

A metal strip protects the external corners.

The poor writer can ingeniously bury the action of a sentence almost anywhere. With the common verbs *make*, *give*, *get*, *have*, and *use*, the writer can bury the action as an object:

Action in an object

We have the belief that oxidized nitrogen is a significant nutrient in the upper trophogenic zone.

Properly revised, the sentence puts the action in the verb:

Action in a verb

We believe that oxidized nitrogen is a significant nutrient in the upper trophogenic zone.

Some writers can even bury the action in an adjective:

Action in an adjective

The new understanding of phytoplankton bloom dynamics in the Ross Sea produced an excited reaction in the biologists.

Revised:

Action in a verb

The new understanding of phytoplankton bloom dynamics in the Ross Sea excited the biologists.

When writing, and particularly when rewriting, you should always ask yourself, Where's the action? If the action does not lie in the verb, rewrite the sentence to put it there, as in this sample:

Action in nouns

Music therapy is the scientific application of music to accomplish the restoration, maintenance, and improvement of mental health.

This sentence provides an excellent example of how verbs are frequently turned into nouns by the use of the suffixes *-ion*, *-ance* (or *-ence*), and *-ment*. If

you have sentences full of such suffixes, you may not be writing as actively as you could be. Rewritten to put active ideas into verb forms, the sentence reads this way:

Action in verbs

Music therapy applies music scientifically to restore, maintain, and improve mental health.

The rewritten sentence defines *music therapy* in one-third less language than the first sentence, without any loss of meaning or content.

Active and Passive Voice

We discuss active and passive voice sentences in Chapter 9, but let us quickly explain the concept here. In an active voice sentence, the subject performs the action and the object receives the action, as in “The heart pumps the blood.” In a passive voice sentence, the subject *receives* the action, as in “The blood is pumped.” If you want to include the doer of the action, you must add this information in a prepositional phrase, as in “The blood is pumped *by the heart*.” We urge you to use the active voice more than the passive. As the *CBE Style Manual*, published by the Council of Biology Editors, points out, “The active is the natural voice in which people usually speak or write, and its use is less likely to lead to wordiness and ambiguity.”¹¹

However, you should not ignore the passive altogether. The passive voice is often useful. You can use the passive voice to emphasize the object receiving the action. The passive voice in “Influenza may be caused by any of several viruses” emphasizes *influenza*. The active voice in “Any of several viruses may cause influenza” emphasizes the *viruses*.

Often the agent of action is of no particular importance. When such is the case, the passive voice is appropriate because it allows you to drop the agent altogether:

Appropriate passive

Edward Jenner’s work on vaccination was published in 1796.

Be aware, however, that inappropriate use of the passive voice can cause you to omit the agent when knowledge of the agent may be vital. Such is often the case in giving instructions:

Poor passive

All doors to the biology building will be locked at 9 P.M.

This sentence may not produce locked doors until it is rewritten in the active voice:

Active voice

The custodian will lock all doors to the biology building at 9 P.M.

Also, the passive voice can lead to dangling participles, as in this sentence:

Passive with dangling modifier

While conducting these experiments, the chickens were seen to panic every time a hawk flew over.

Chickens conducting experiments? Not really. The active voice straightens out the matter:

Active voice

While conducting these experiments, we saw that the chickens panicked every time a hawk flew over.

(See also Dangling Modifier in the Handbook.)

Although the passive voice has its uses, too much of it produces lifeless and wordy writing. Therefore, use it only when it is clearly appropriate.

First-Person Point of View

Once, reports and scientific articles were typically written in the third person—"This investigator has discovered"—rather than first person—"I discovered." The *CBE Style Manual* labels this practice the "passive of modesty" and urges writers to avoid it.¹² Many other style manuals for scientific journals now recommend the first person and advise against the use of the third person on the grounds that it is wordy and confusing. We agree with this advice.

The judicious use of *I* or *we* in a technical report is entirely appropriate. Incidentally, such usage will seldom lead to a report full of *I*'s and *we*'s. After all, there are many agents in a technical report other than the writer. In describing an agricultural experiment, for example, researchers will report how *the sun shone*, *photosynthesis occurred*, *rain fell*, *plants drew nutrients from the soil*, and *combines harvested*. Only occasionally will researchers need to report their own actions. But when they must, they should be able to avoid such roundabout expressions as "It was observed by this experimenter." Use "*I* observed" instead. Use "We observed" when there are two or more experimenters.

A Caution about Following Rules

We must caution you before we leave this section on clear sentence structure. We are not urging upon you an oversimplified primer style, one often satirized by such sentences as “Jane hit the ball” and “See Dick catch the ball.” Mature styles have a degree of complexity to them. Good writers, as Christensen’s research shows, do put information before the subject. Nothing is wrong with putting information between the subject and verb of a sentence. You will find many such sentences in this book. However, you should be aware that research shows that sentences that are too long, too complex, or too dense cause many readers difficulty. Despite increasingly good research into its nature, writing is a craft and not a science. Be guided by the research available, but do not be simplistic in applying it.

SPECIFIC WORDS

Semanticists have developed the concept of the abstraction ladder, which is composed of rungs that ascend from very specific words such as *table* to abstractions such as *furniture*, *wealth*, and *factor*. The human ability to move up and down this ladder enabled us to develop language, on which all human progress depends. Because we can think in abstract terms, we can call a moving company and tell it to move our furniture. Without abstraction, we would have to bring the movers into our house and point to each object we wanted moved. Like many helpful writing techniques, however, abstraction is a device you should use carefully.

Stay at an appropriate level on the abstraction ladder. Do not say “inclement weather” when you mean “rain.” Do not say “overwhelming support” when you mean “62% percent of the workers supported the plan.” Do not settle for “suitable transportation” when you mean “a bus that seats thirty-two people.”

Writing that uses too many abstractions is lazy writing. It relieves writers of the need to observe, to research, and to think. They can speak casually of “factors,” and neither they nor their readers really know what they are talking about. Here is an example of such lazy writing. The writer was setting standards for choosing a desalination plant to be used at Air Force bases.

Too abstract

- The quantity of water must be sufficient to supply a military establishment.
- The quality of the water must be high.

The writer here thinks he has said something. He has said little. He has listed slovenly abstractions when, with a little thought and research, he could have listed specific details. He should have said:

Use of specific detail

- To supply an average base with a population of 5,000, the plant should purify 750,000 gallons of water a day (AFM 88-10 sets the standard of 150 gallons a day per person).
- The desalinated water should not exceed the national health standard for potable water of 500 parts per million of dissolved solids.

Abstractions are needed for generalizing, but they cannot replace specific words and necessary details. Words mean different things to different people. The higher you go on the abstraction ladder, the truer this is. The abstract words *sufficient* and *high* could be interpreted in as many different ways as the writer had readers. No one can misinterpret the specific details given in the rewritten sentences.

Abstractions can also burden sentences in another way. Some writers are so used to thinking abstractly that they begin a sentence with an abstraction and *then* follow it with the specific word, usually in a prepositional phrase. They write,

Poor

The problem of producing fresh water became troublesome at overseas bases.

Instead of

Revised

Producing fresh water became a problem at overseas bases.

Or

Poor

The circumstance of the manager's disapproval caused the project to be dropped.

Instead of

Revised

The manager's disapproval caused the project to be dropped.

We do not mean to say you should never use high abstractions. A good writer moves freely up and down the abstraction ladder. But when you use words from high on the ladder, use them properly—for generalizing and as a shorthand way of referring to specific details you have already given.

POMPOSITIVY

State your meaning as simply and clearly as you can. Do not let the mistaken notion that writing should be more elegant than speech make you sound pompous. Writing *is* different from speech. Writing is more concise, more compressed, and often better organized than speech. But elegance is not a prerequisite for good writing.

A sign at a gas station reads, "No gas will be dispensed while smoking." Would the employees in that service station speak that way? Of course not. They would say, "Please put out that cigarette" or "No smoking, please." But the sign had to be elegant, and the writer sounds pompous—and illiterate as well.

If you apply what we have already told you about clear sentence structure, you will go a long way toward tearing down the fence of artificiality between you and the reader. We want to touch on just three more points: empty words, elegant variation, and pompous vocabulary.

Empty Words

The easiest way to turn simple, clear prose into elegant nonsense is to throw in empty words, such as these phrases that begin with the impersonal *it*: "It is evident," "It is clear that," or, most miserable of all, "It is interesting to note that." When something is evident, clear, or interesting, readers will discover this for themselves. If something is not evident, clear, or interesting, rewrite it to make it so. When you must use such qualifying phrases, at least shorten them to "evidently," "clearly," and "note that." Avoid constructions like "It was noted by Jones." Simply say, "Jones noted."

Many empty words are jargon phrases writers throw in by sheer habit. You see them often in business correspondence. A partial list follows:

to the extent that	is already stated
with reference to	in view of
in connection with	inasmuch as
relative to	with your permission
with regard to	hence
with respect to	as a matter of fact

We could go on, but so could you. When such weeds crop up in your writing, pull them out.

Another way to produce empty words is to use an abstract word in tandem with a specific word. This produces such combinations as

20 in number *for* 20
wires of thin *size for* thin wires
red in color *for* red

When you have expressed something specifically, do not throw in the abstract term for the same word.

Elegant Variation

Elegant variation will also make your writing sound pompous.¹³ Elegant variation occurs when a writer substitutes one word for another because of an imagined need to avoid repetition. This substitution can lead to two problems: The substituted word may be a pompous one and the variation may mislead the reader into thinking that some shift in meaning is intended. Both problems are evident in the following example:

Elegant variation

Insect damage to evergreens varies with the condition of the plant, the pest species, and the hexapod population level.

Confusion reigns. The writer has avoided repetition, but the reader may think that the words *insect*, *pest*, and *hexapod* refer to three different things. Also, *hexapod*, though a perfectly good word, sounds a bit pompous in this context. The writer should have written,

Revised

Insect damage to evergreens varies with the condition of the plant, the insect species, and the insect population level.

Remember also that intelligent repetition provides good transition. Repeating key words reminds the reader that you are still dealing with your central theme (see pages 84–85).

Pompous Vocabulary

Generally speaking, the vocabulary you think in will serve in your writing. Jaw-breaking thesaurus words and words high on the abstraction ladder will not convince readers that you are intellectually superior. Such words will merely

convince readers that your writing is hard to read. We are not telling you here that you must forgo your hard-won educated vocabulary. If you are writing for readers who understand words such as *extant* or *prototype*, then use them. But use them only if they are appropriate to your discussion. Don't use them to impress people.

Nor are we talking about the specialized words of your professional field. At times these are necessary. Just remember to define them if you think your reader will not know them. What we are talking about is the desire some writers seem to have to use pompous vocabulary to impress their readers.

The following list is a sampling of heavy words and phrases along with their simpler substitutes.

<i>accordingly</i> : so	<i>due to the fact that</i> : because
<i>acquire</i> : get	<i>facilitate</i> : ease, simplify
<i>activate</i> : begin	<i>for the purpose of</i> : for
<i>along the lines of</i> : like	<i>in accordance with</i> : by, under
<i>appreciative of</i> : appreciates	<i>in connection with</i> : about
<i>assist</i> : help	<i>initiate</i> : begin
<i>compensation</i> : pay	<i>in order to</i> : to
<i>consequently</i> : so	<i>nevertheless</i> : but, however
<i>in the event that</i> : if	<i>prior to</i> : before
<i>in the interests of</i> : for	<i>subsequent to</i> : later, after
<i>in this case</i> : here	<i>supportive of</i> : supports
<i>make application to</i> : apply	<i>utilize</i> : use

You would be wise to avoid the word-wasting phrases on this list and other phrases like them. You really don't need to avoid the single words shown, such as *acquire* and *assist*. All are perfectly good words. But to avoid sounding pompous, don't string large clumps of such words together. Be generous in your writing with the simpler substitutes we have listed. If you don't, you are more likely to depress your readers than to impress them. Don't be like the pompous writers who seek to bury you under the many-syllable words they use to express one-syllable ideas.

We urge you to read as much good writing—both fiction and nonfiction—as time permits. Stop occasionally and study the author's choice of words. You will find most authors to be lovers of the short word. Numerous passages in Shakespeare are composed almost entirely of one-syllable words. The same holds true for the King James Bible. Good writers do not want to impress you with their vocabularies. They want to get their ideas from their heads to yours by the shortest, simplest route.

GOOD STYLE IN ACTION

A final example will summarize much that we have said. Insurance policies were verbal bogs for so long that most buyers of insurance gave up on finding one clearly written. However, the St. Paul Fire and Marine Insurance Company decided that it was both possible and desirable to simplify the wording of its policies. The company revised one of its policies, eliminating empty words and using only words familiar to the average reader. In the revision, the company's writers avoided excessive sentence complexity and used predominantly the active voice and active verbs. They broke long paragraphs into shorter ones. The insurance company became *we* and the insured *you*. Definitions were included where needed rather than segregated in a glossary. The resulting policy is wonderfully clear. Compare a paragraph of the old with the new.¹⁴

Old:

Cancellation

Passive voice

Average sentence length: 29 words

Empty words

Unfamiliar words

All one paragraph

A 66-word sentence

This policy may be canceled by the Named Insured by surrender thereof to the Company or any of its authorized agents, or by mailing to the Company written notice stating when thereafter such cancellation shall be effective. This policy may be canceled by the Company by mailing to the Named Insured at the address shown in this Policy written notice stating when, not less than thirty (30) days thereafter, such cancellation shall be effective. The mailing of notice as aforesaid shall be sufficient notice and the effective date of cancellation stated in the notice shall become the end of the policy period. Delivery of such written notice either by the Named Insured or by the Company shall be equivalent to mailing. If the Named Insured cancels, earned premium shall be computed in accordance with the customary short rate table and procedure. If the Company cancels, earned premium shall be computed pro rata. Premium adjustment may be made at the time cancellation is effected or as soon as practicable thereafter. The check of the Company or its representative, mailed or delivered, shall be sufficient tender of any refund due the Named Insured. If this contract insures more than one Named Insured, cancellation may be effected by the first of such Named Insureds for the account of all the

Named Insureds; notice of cancellation by the Company to such first Named Insured shall be deemed notice to all Insureds and payment of any unearned premium to such first Named Insured shall be for the account of all interests therein.

New:

Active voice

Average sentence length: 15 words

Clear, specific language

Can This Policy Be Canceled?

Yes it can. Both by you and by us. If you want to cancel the policy, hand or send your cancellation notice to us or our authorized agent. Or mail us a written notice with the date when you want the policy canceled. We'll send you a check for the unearned premium, figured by the short rate table—that is, pro rata minus a service charge.

Short paragraphs

If we decide to cancel the policy, we'll mail or deliver to you a cancellation notice effective after at least 30 days. As soon as we can, we'll send you a check for the unearned premium, figured pro rata.

Examples that substitute specific, familiar words for the high abstractions of the original policy are used freely. For instance:

You miss a stop sign and crash into a motorcycle. Its 28-year-old married driver is paralyzed from the waist down and will spend the rest of his life in a wheelchair.

A jury says you have to pay him \$1,300,000. Your standard insurance liability limit is \$300,000 for each person. We'll pay the balance of \$1 million.

Or:

We'll defend any suit for damages against you or anyone else insured even if it's groundless or fraudulent. And we'll investigate, negotiate and settle on your behalf any claim or suit if that seems to us proper and wise.

You own a two-family house and rent the second floor apartment to the Miller family. The Millers don't pay the rent and you finally have to evict

them. Out of sheer spite, they sue you for wrongful eviction. You're clearly in the right, but the defense of the suit costs \$750. Under this policy we defend you and win the case in court. The whole business doesn't cost you a penny.

Incidentally, there is no fine print in the policy. It is set entirely in 10-point type, a type larger than that used in most newspapers and magazines. Headings and even different-colored print are used freely to draw attention to transitions and important information. Most states now require insurance policies sold within their borders to meet "plain language" requirements. We can hope, therefore, that the impossible-to-read insurance policy is a thing of the past.

You can clean up your own writing by following the principles discussed in this chapter and demonstrated in the revised insurance policy. Also, if you exercise care, your own manner of speaking can be a good guide in writing. You should not necessarily write as you talk. In speech, you may be too casual, even slangy. But the sound of your own voice can still be a good guide. When you write something, read it over; even read it aloud. If you have written something you know you would not speak because of its artificiality, rewrite it in a comfortable style. Rewrite so that you can hear the sound of your own voice in it.

CHOOSING A STYLE FOR INTERNATIONAL READERS

In the United States, good technical and business style calls for clarity and succinctness. It's a style that is suitable in English-speaking Canada. The Canadian edition of this text, revised specifically for Canadian readers by two Canadian teachers, has no significant changes in this chapter.¹⁵ It's a style that, with some modification, will not offend members of most Western European cultures. However, cultures in which romance languages—such as French, Spanish, and Italian—predominate do prefer a more formal style where conciseness is not an issue.

Asian readers and, to a lesser degree, Mexican and Latin American readers, may find the directness of the North American style blunt and aggressive, even rude. Their style compared to the North American style is more formal, and ideas, particularly dissenting ideas, are presented much more indirectly. In short, the success of any style depends on how readers react to it. We offer our major advice about some of the adjustments you can make in Chapter 7. Writing for International Readers.

PLANNING AND REVISION CHECKLISTS

You will find the planning and revision checklists following Chapter 2, Composing, and inside the front cover valuable in planning and revising any presentation of technical information. The following questions apply specifically to

style. They summarize the key points in this chapter and provide a checklist for revising.

Planning

You can revise for good style, but you can't plan for it. Good style comes when you are aware of the need to avoid the things that cause bad style: ponderous paragraphs, overly dense sentences, excessive use of passive voice, pomposity, and the like. Good style comes when you write to express your thoughts clearly, not to impress your readers. Good style comes when you have revised enough writing that the principles involved are ingrained in your thought process.

Revision

- Do you have a style checker in your word processing software? If so, use it, but exercise the cautions we advocate in Chapter 2, Composing.
- Are the central thoughts in your paragraphs clearly stated? Do the details in your paragraphs relate to the central thought?
- Have you broken up your paragraphs sufficiently to avoid long, intimidating blocks of print?
- Have you guided your reader through your paragraphs with the repetition of key words and with transition statements?
- Have you used lists or tables when they would help the reader?
- Are your sentences of reasonable length? Have you avoided sentences of sixty to one hundred words? Does your average sentence length match that of professional writers—about twenty words?
- Professional writers begin about 75 percent of their sentences with the subject of the sentence. How does your percentage of subject openers compare to that figure? If your average differs markedly, do you have a good reason for the difference?
- When you use sentence openers before the subject, do they provide good transitions for your readers?
- Have you limited sentence openers before the subject to a reasonable length?
- Have you avoided large blocks of words between your subject and your verb?
- Have you used noun strings to modify other nouns? If so, are you sure your readers will be able to sort out the relationships involved?
- Have you avoided the use of multiple negatives?
- Are your action ideas expressed in active verbs? Have you avoided burying them in nouns and adjectives?
- Have you used active voice and passive voice appropriately? Are there passive voice sentences you should revise to active voice?
- Have you used abstract words when more specific words would be clearer for your readers? Do your abstractions leave unintended interpretations open to

the reader? When needed, have you backed up your abstractions with specific detail?

- Have you avoided empty jargon phrases?
- Have you chosen your words to express your thoughts clearly for your intended reader? Have you avoided pompous words and phrases?
- Is your style suitable for international readers?

EXERCISES

1. You should now be able to rewrite the example sentence on page 82 in clear, forceful prose. Here it is again; try it:

While determination of specific space needs and access cannot be accomplished until after a programmatic configuration is developed, it is apparent that physical space is excessive and that all appropriate means should be pursued to ensure that the entire physical plant is utilized as fully as feasible.

2. Here is the pompous paragraph from page 80. Rewrite it in good prose:

The purpose of this PPM [Policy and Procedure Memorandum] is to ensure, to the maximum extent practicable, that highway locations and designs reflect and are consistent with federal, state and local goals and objectives. The rules, policies, and procedures established by this PPM are intended to afford full opportunity for effective public participation in the consideration of highway location and design proposals before submission to the federal Department of Transportation for approval. They provide a medium for free and open discussion and are designed to encourage early and amicable resolution of controversial issues that may arise.

3. Following are some expressions that the Council of Biology Editors believes should be rewritten.¹⁶ Using the principles you have learned in this chapter, rewrite them:

- an innumerable number of tiny veins
- as far as our own observations are concerned, they show
- ascertain the location of
- at the present moment
- at this point in time
- bright green in color
- by means of
- (we) conducted inoculation experiments on
- due to the fact that
- during the time that
- fewer in number

- for the purpose of examining
- for the reason that
- from the standpoint of
- goes under the name of
- if conditions are such that
- in all cases
- in order to
- in the course of
- in the event that
- in the near future
- in the vicinity of
- in view of the fact that
- it is often the case that
- it is possible that the cause is
- it is this that
- it would thus appear that
- large numbers of
- lenticular in character
- masses are of large size
- necessitates the inclusion of
- of such hardness that
- on the basis of
- oval in shape, oval shaped
- plants exhibited good growth
- prior to (in time)
- serves the function of being
- subsequent to
- the fish in question
- the tests have not as yet
- the treatment having been performed
- there can be little doubt that
- throughout the entire area
- throughout the whole of this experiment
- two equal halves
- If we interpret the deposition of chemical signals as initiation of courtship, then initiation of courtship by females is probably the usual case in mammals.
- A direct correlation between serum vitamin B12 concentration and mean nerve conduction velocity was seen.
- It is possible that the pattern of herb distribution now found in the Chilean site is a reflection of past disturbances.
- Following termination of exposure to pigeons and resolution of the pulmonary infiltrates, there was a substantial increase in lung volume,

some improvement in diffusing capacity, and partial resolution of the hypoxemia.

4. Turn the following sentence into a paragraph of several sentences. See whether listing might help. Make the central idea of the passage its first sentence.

If, on the date of opening of bid or evaluation of proposals, the average market price of domestic wool of usable grades is not more than 10 percent above the average of the prices of representative types and grades of domestic wools in the wool category which includes the wool required by the specifications [see (f) below], which prices reflect the current incentive price as established by the Secretary of Agriculture, and if reasonable bids or proposals have been received for the advertised quantity offering 100 percent domestic wools, the contract will be awarded for domestically produced articles using 100 percent domestic wools and the procedure set forth in (e) and (f) below will be disregarded.

5. Lest you think all bad writing is American, here are two British samples, quoted in a magazine devoted to ridding Great Britain of gobbledygook.¹⁷ Try your hand with them.

- The garden should be rendered commensurate with the visual amenities of the neighborhood.
- Should there be any intensification of the activities executed to accomplish your present hobby the matter would have to be reappraised.

6. The following description of how liposome technology may lead to better medical treatment is intended for an educated lay audience, an audience probably much like you. Analyze the description using the principles of this chapter: paragraph development, lists and tables, clear sentence structure, the use of specific words, and the avoidance of pomposity. You should consider such elements of style as transitions; paragraph length; sentence length, order, density, and complexity; and active and passive voice. Using your analysis, decide whether this description succeeds. Write a memo to your teacher stating and justifying your decision (see Letter and Memorandum Format in Appendix B).

Can microscopic artificial membranes help doctors treat cancer, angina, and viral infections more effectively, and lead to better vaccines, bronchodilators, eye drops, and sunscreens? The researchers who are developing liposome technology hope so. A liposome is a tiny sphere of fatty molecules surrounding a watery interior. Because they are made of the same material as cell surface membranes, liposomes stick to cells and

are not toxic. These characteristics make them attractive candidates for drug delivery vehicles.

In 1980, two groups of researchers used liposomes filled with a common antibiotic to cure mice having a severe, but localized, infection. The infected cells were of a kind that is specialized to take up foreign bodies, and so they readily engulfed the liposomes. However, getting other kinds of cells to take up drug-filled liposomes has proven to be more difficult. A number of groups of researchers are experimenting with antibody-tagged liposomes filled with an anticancer drug. The liposomes are guided to the diseased tissue by the antibodies, which seek out cancerous cells but spare healthy ones. This selectivity allows smaller amounts of a drug to be used with greater effect, an important advantage considering the serious toxicity of many anticancer drugs.

Other research teams are developing liposome-drug compounds that would be injected into muscle to release growth hormone or anticancer agents over a period of weeks. Scientists also hope to use liposomes to improve the safety and effectiveness of vaccines, including an influenza vaccine. As the cost of both natural lipids (extracted from egg yolk and soybeans) and artificial lipids declines, the future may bring many other liposome-containing medical products as well as nonmedical items, such as cosmetics.¹⁸