IDEAS FOR CLEAR TECHNICAL WRITING

By B. P. Robinson

U.S. GEOLOGICAL SURVEY

Open-File Report 83-867

Indianapolis, Indiana

1984

UNITED STATES DEPARTMENT OF THE INTERIOR

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GEOLOGICAL SURVEY

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ABBREVIATIONS AND SYMBOLS

adj.	adjective
Do.	ditto
GPO	Government Printing Office
IRS	Internal Revenue Service
STA	Suggestions to Authors of Reports of the United States Geological Survey
WNI 1, 2, and 3	Webster's New International Dictionaries, first, second, and third editions
***	omission of one or more words

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By B. P. Robinson

ABSTRACT

The three greatest obstacles to clear technical-report writing are probably (1) imprecise words, (2) wordiness, and (3) poorly constructed sentences. Examples of category 1 include abstract words, jargon, and vogue words; of category 2, sentences containing impersonal construction superfluous words; and of category 3, sentences lacking parallel construction and proper order of related words and phrases. These examples and other writing-related subjects are discussed in the report, which contains a cross-referenced index and 24 references.

INTRODUCTION

The U.S. Geological Survey is obligated to make the results of its field and laboratory investigations available to the public. Therefore, Geological Survey employees must discuss and summarize their investigations in publishable reports. The employees must learn to arrange words and phrases in a logical and lucid manner. This ability can be learned by their reading a broad variety of documents--letters, memorandums, technical reports, books on technical writing, and nontechnical articles and essays; using grammars, technical manuals, glossaries, word-usage guides, dictionaries, handbooks, and other aids for writers; and practicing writing.

*** "Few writers are 'born'; even great writers become writers the same way Paderewski became a great pianist; by practicing, and practicing, and practicing, and practicing some more; by writing, and writing, and writing, or perhaps by writing and rewriting, writing and rewriting, writing and rewriting. ***," according to Bishop, Eckel, and others (1978, p. 19).

The author has reviewed more than 250 technical reports--as a member of the Quality of Water Branch reports section in the early 1960's and as reports specialist and principal reviewer of technical reports in the New York and Indiana districts of the Geological Survey's Water Resources Division, 1970-75 and 1975 to now. Many of the writing problems in these reports and in Water Resources Division and district memorandums are presented alphabetically here. A list of 24 references and a cross-referenced index follow the aplhabetical list.

The three greatest obstacles to clear technical-report writing are probably (1) imprecise words, (2) wordiness, and (3) poorly constructed sentences. Examples of category 1 include abstract terms, jargon, and vogue words. Speaking of imprecise words, Mark Twain said, "The difference between the right word and

the almost right word is the difference between a bolt of lightning and a lightning bug." And Fowler's (1965, p. 460) advice on why writers should avoid vogue words is that popular use more often than not misrepresents the original meaning and results in a tawdry style. Examples of category 2 include impersonal construction and superfluous words, and examples of category 3 include sentences lacking parallel construction and proper order of related words and phrases. Ways of correcting the preceding examples and other writing problems are discussed in the report.

Acknowledgments

Information on technical-writing problems has been obtained from the fifth and sixth editions of "Suggestions to Authors of the Reports of the United States Geological Survey (U.S. Geological Survey, 1958; and Bishop, Eckel, and others, 1978) and from 22 additional references. The information is referenced immediately after its position in the text. Permission in writing has been obtained to quote material that has been copyrighted, and the permission has been acknowledged on each page where the material is quoted.

The constructive comments and the encouragements of colleagues Dale R. Glatfelter, Robert L. Gold, Irving G. Grossman, and James G. Peters are gratefully acknowledged.

"Brackets" and "Italics" in Material Quoted from "Suggestions to Authors"

Some of the sentences quoted from "Suggestions to Authors," fifth edition (U.S. Geological Survey, 1958), contain words in brackets or italics, or in both, for illustrating usage. Words in italics are poor usage; words in brackets are preferred usage.

ALPHABETICAL LIST OF IDEAS

abbreviations.

The standard format for abbreviations in Survey reports is to enclose the spelled-out form in parentheses after the first use of the abbreviation in the text and in the abstract, as "*** ANL (Argonne National Laboratory) ***"; thereafter, "ANL" only (Bishop, Eckel, and others, 1978, p. 93).

***

Instead of defining the terms in text, an author may follow an alternative procedure of placing just after the table of contents a glossary with needed definitions. A third procedure is to include in the glossary only signs and symbols and to define the abbreviations in text. Any of these procedures is acceptable so long as consistency of format and usage is maintained and meanings are clear. Remember, though, that the abstract must be independently intelligible. Quoted from Bishop, Eckel, and others (1978, p. 94).

For abbreviations of dates, descriptions of land, geographic terms, names, time, titles, units of measure, and many other words, and for signs and symbols, see U.S. Government Printing Office, 1973, p. 149-168.

about.

"About" is not needed in the following sentences where an estimate and an approximation are clearly stated:

Pumping in 1969 was estimated to be "about" 300 million gallons per day.

The sample contains "about" 1 to 5 percent ***.

above.

See "over and under," p. 33.

abstract terms.

The use of abstract terms for concrete terms that are easily understood is one of the commonest faults in scientific writing. It not only multiplies words but befogs meanings and imposes unnecessary burdens on the reader. The author should ask himself, after he has written an abstract term, "What do I mean by this term? What is the concrete thing about which I am writing?" He can generally supply the concrete term without trouble, and he may discover that the abstract term is mere verbiage.

"Along these lines" or "along this line" is trite, unprecise, or unclear, and it usurps the place of better phrases. The following sentences can be improved easily:

A large part of the area is irrigable, but *activities along this line have up to the present time been* [irrigation at present is] confined mainly to the stream valleys.
***Investigations along petrographic lines* [Petrographic investigations] * * *.**
These analyses were *conducted along the same lines* [made in the same way].

abstract terms. --Continued

The correct use of "cases" and "instances" is unfamiliar to many scientists and engineers, who write sentences like these—

The lowlands in some *cases* [places] contain lakes, the most conspicuous *instances* being Crystal, Glen, and Portage Lakes.

In a few *instances* [places], as at Clement Point * * *.

One such *case* [eruption] is definitely known to have formed a cinder and ash cone over 200 feet high. (So elusive a thing as a case cannot form so substantial a thing as a cinder cone.)

Specimens in some *cases* [specimens] show veins of calcite.

The enrichment observed in the *case of the* copper veins * * *.

In most of these *cases it has been found that the* coal beds have certain peculiarities by which they can be recognized.

In the case of the solutions affecting the monzonite *they* were evidently rich in potash.

In most cases metamorphism [usually] is accompanied by chemical changes.

In many *cases* [of] these well records have been carelessly kept.

***

Some writers intrude such words as "character," "conditions," and "purposes" into sentences in which they are superfluous or even absurd.

The surface is *of a* very uneven *character.*

With proper drainage *conditions* the land could be made suitable for farming *purposes.*

The flow of the stream was obstructed by ice *conditions.* (However, in surface-water investigations, the term "ice conditions" has a specific meaning, as in "The accuracy of the measurements was lowered by ice conditions.")

Most of this petroleum is used for fuel *purposes.*

Under [In] base-leveled *conditions* [regions] underground circulation generally is sluggish.

The river here *loses its split-up character and* [is not split up but] flows in a single channel.

The *soft nature* [softness] of the beds * * *.

The mesas are arid, and *because of their disconnected character there is* [as they are disconnected they afford] no means of storing water for irrigation *purposes.*

"Under extremely shallow-water conditions" generally means "in very shallow water"; "tuffs of an andesitic character" probably means "andesitic tuffs"; and "public roads of fairly good character" means "fairly good public roads." See "wrong subject," page 54. Quoted from U.S. Geological Survey (1958, p. 183-185).

accuracy, precision.

"Accuracy" and "precision" are not synonymous. A measurement, or a memory, can be precise but quite inaccurate. "Precision" has to do with the fineness of a given value; that is, "2.462 m" is more precise, but not necessarily more accurate, than "2.4 m." In the terminology of statistics, "accuracy" is the agreement of a measured or computed value with the absolute or true value; "precision" is the degree of coincidence of repeated measurements of a single quantity. Quoted from Bishop, Eckel, and others (1978, p. 240.)

acid mine drainage.

Do not hyphenate.

adjectives.

See "compounding," p. 14, "order of related words and phrases," p. 32, and "strung-on modifiers," p. 45.

adverbs, position of.

Generally, adverbs that modify verbs are placed after the verb. They may be placed elsewhere, however, depending upon the structure of the sentence and the emphasis desired.

≫ The temperature within the capsule dropped [transitive verb] twenty degrees [direct object] *quickly* [adverb].

But if the verb is composed of an auxiliary verb and a main verb, the normal place for the adverb modifying it is between these two elements.

≫ A certain amount of "trouble-fixing" is *usually* performed on a test bench after the equipment has been replaced by properly working units.

A transitive verb and its object normally should not be separated by an adverb.

≫ With less queuing, the average length of the busy periods is shortened, and it is therefore necessary to fill [transitive verb] the "holes" [direct object] *partially* [adverb], to maintain the carried load at its designated level.

If the compound verb has two or more auxiliaries, the adverb is placed after the first auxiliary, rather than after the entire auxiliary, if the force of the adverb is intended to apply to the entire compound verb.

≫ The trunk-selection effect indicates that trunks originating from older switching systems should [auxiliary] *generally* be [auxiliary] given more attention than those originating from more modern switching systems.

Quoted by permission of Bell Laboratories (1979, p. 54).

Adverbs are also used to modify other adverbs, verbals (infinitives, gerunds, and participles), adjectives, and the rest of the sentence (Hodges and Whitten, 1977, p. 424); however, some professional writers question the use of adverbs as modifiers of sentences. See "hopefully," p. 25. For other discussions of adverbs, see "order of related words and phrases," p. 32; "time and place," p. 48; and "while", p. 52.

affect, effect.

Affect is not a noun except in a very narrow psychological sense. As a verb, it means to influence.

Effect may be a noun or a verb. As a verb, it means to bring about, accomplish, or result in; as a noun, it means outcome or result.

The environment affected the device, but the effect was not significant.

The new administration effected a great many changes.

Quoted by permission of Bell Laboratories (1979, p. 32).

ago, since.

"Ago" and "since" should be discriminated. "Ago" refers to a point in past time, as in "The volcano erupted 20 years ago"; "since" refers to the time intervening between such a point and the present, as in "It has been 20 years since the volcano erupted."

Some writers use "since" ambiguously. In each of the following phrases the "since" on first reading might be taken to indicate time and should be replaced by "because":

> Since these experiments were made to determine the order of solubility of the compounds studied, * * *.
>
> Since the war in Europe has affected ocean transportation, * * *.
>
> Since the Snow Storm mine ceased production and the Lost Packer mine shipped only a few cars of matte, the increase during the year was due to * * *.

Quoted from U.S. Geological Survey (1958, p. 152).

alliteration.

See "euphony and alliteration," p. 20.

all of.

The word "of" in the phrase "all of" is generally superfluous.

According to the "Standard Dictionary," "all of" as a popular idiom is used to emphasize the totality of that which is referred to, as "How many of these men did you see?" "I saw all of them." The best literary usage omits the "of" as needless, preferring "I saw them all."

The usage just stated represents the judgment of many literary critics, a judgment based on the assumption that in phrases like "some of," "many of," "one of" the word "of" is a partitive—that is, a term implying partition or denoting a part—whereas in "all of" no expression of partition is intended. "The whole of" has been criticized on the same ground. A critic writes—

> One may say "the whole staff accompanied the general" or (for emphasis) "the whole of the staff," but it would be better to say "the entire staff" or "all members of the staff," not "all of the members of the staff." "I will take it all" is regarded as better than "I will take all of it."

But "of" after "all" should not be cut out mechanically. In the sentence "Many *but not all* of these fragments are rounded" the italicized words are superfluous, but when they are cut out the "of" should stand. Quoted from U.S. Geological Survey (1958, p. 189).

along these lines.

See "abstract terms," p. 3.

also.

"Also" is best reserved either for adverbial use ("The trail was also very steep.") or for the phrase "and also." "Also" should not begin a sentence or an independent clause.

The trail was rocky; also it was very steep.	The trail was rocky; it was also very steep. *Or* (better): The trail was steep and rocky.

Quoted from Bishop, Eckel, and others (1958, p. 240).

altitude, elevation.

Both "altitude" and "elevation" are used in referring to distance above sea level, but "elevation" also means uplift and is used in that sense in many geologic reports ("elevation of the two areas to their

altitude, elevation. --Continued

present altitudes"). "Altitude" is preferable for indicating distance above sea level. However, "elevation" is a well-established term in industry and among engineers, and their use of "elevation" for "altitude" is followed appropriately in many Survey reports. The terms should not be used interchangeably in the same report. If "elevation" is used for indicating distance above or below sea level, it should not be used in the same report for indicating uplift; use "uplift" for the latter. Quoted from U.S. Geological Survey (1958, p. 153). See "National Geodetic Vertical Datum of 1929 (NGVD of 1929)," p. 30.

amount, number, quantity.

According to Webster, "amount" implies the combination of sums, weights, or measures that form a whole, as in "the amount of ore mined in one year." "Number" is used for an aggregate of persons or things, to which (except for things in bulk or mass) "amount" should not be applied. "Quantity" is applied generally to the measure of a bulk or mass, but in scientific usage it is applied to anything, according to Webster, "measurable in extent, duration, volume, magnitude, intensity, or value." Quoted from U.S. Geological Survey (1958, p. 180-181).

analyze, analysis.

The words "analyze" and "analysis" are often misused for "determine" or "determination." A report of "15 copper analyses" properly refers to 15 samples of copper ore which were analyzed for copper or for other elements; a report on the copper content of 15 rocks should refer to "15 copper determinations." Quoted from Bishop, Eckel, and others (1978, p. 170).

animate and inanimate objects.

See "suffering rocks and other fallacies," p. 45.

antecedents and pronouns.

In many sentences, pronouns that require antecedents have none; in other sentences the grammatical antecedents are not the true ones—

The basins receive much of the runoff of the adjacent mountainous catchment areas, in which many streams rise, but *which* [the streams] end when they reach the margin of the desert. (Grammatically both the first and the second "which" refer to "areas," but the second one was intended to refer to "streams.")

A *9-span* steel highway bridge [of 9 spans], 3 of which are over the normal river channel * * *. (The grammatical antecedent of "which" is "bridge"; the real antecedent is "9 spans.")

With it is much spotted ore that could be concentrated, but *that* [concentration] has not yet been undertaken. (The "that" in the last clause has no expressed antecedent.)

They enable stock to spread out *into territory* immediately after a rain [into territory] that they are unable to graze in normal times.

The lower salt series, which was deposited upon the Delaware Mountain formation in the Delaware Basin and which *it* filled [the basin] to overflowing * * *. (The second "which" does not refer to "lower salt series" but to "Delaware Basin.")

A succession of relative pronouns, each referring to a different antecedent (a sort of echelon arrangement), makes an awkward sentence. The following example shows how 1 "which" instead of 3 could have been used:

Among the steeper dips north of the synclinal axis are those *which occur* along the southeast flank of the Hamilton dome, which, like the Bell Rock dome, is situated upon the axis of an anticline *which* [that] almost parallels the Round Bottom syncline.

A word that refers back to an antecedent should not itself be made to serve as an antecedent for another word that follows. The weak construction that results is shown in the following example:

antecedents and pronouns. --Continued

These men had been appointed commissioners by the King, to settle all controversies in the colonies. The matter was referred to them, *who* [and] after a full hearing [they] determined * * *. ("Them" is not an adequate antecedent for "who.")

***

"This" or "these" should not be used alone where there can be any doubt as to the meaning, where the reader will be compelled to look back to find the antecedent, or where no antecedent has been expressed. The missing noun generally can be supplied, with advantage to the reader. Use of "which," "this," or "that" to refer to a whole preceding statement is appropriate occasionally where there is no doubt as to the scope of the reference. Often, however, there is room for doubt, and the general reference should be avoided. Insert a noun, such as "this fact," "a procedure which."

The rocks contain * * * numerous cavities. In these [cavities] minerals have been deposited. (Not "these minerals.")

In the Milesburg Gap the quartzite has been quarried to a considerable extent for ganister, and near *this* [the quartzite] quarry barite is found in narrow fissures. Quoted from U.S. Geological Survey (1958, p. 137-139).

a number of.

The phrase "a number of" is overworked by many writers. It is usually intended to mean an indefinite small number, but as 5,000,000 or 50,000,000 is also "a number" it is preferable to use an appropriate and more specific substitute, such as "several" or "a few." Quoted from U.S. Geological Survey (1958, p. 152).

appears, seems.

"Appears" in its primary sense means to come into view, as in "As one travels westward the mountain appears over the horizon in the southwest." "Appears" means also to apprehend and therefore approximates "seems" where "seems" suggests evidence that satisfies the judgment of the writer, as in "It seems clear that the rock was originally a sandstone." "Seems" may suggest something in opposition to fact, however, as in "The rock seems to be gray, but on close inspection it is seen to be buff." Quoted from U.S. Geological Survey (1958, p. 174).

articles (a and the). See "completeness," p. 13.

as. See "like, as," p. 29.

attributed to. See "due to, owing to," p. 18.

authorship.

Both credit and responsibility for the work and the conclusions represented in the reports and maps of the Geological Survey are indicated by naming as authors those whose significant contributions to the investigations and the results are clearly identifiable. ***

***

The person or persons who had immediate and active charge of the investigation and (or) who prepared the report will naturally be named as the author or among the authors of the report. Other coauthorship is restricted normally to those who contributed very substantially to the conduct and results of the investigation. Usually those individuals in more general administrative or supervisory control over the investigation, or those who, as members of the party or group carrying out the investigation, performed relatively routine though valuable technical assistance, are not included as coauthors.

***

authorship.
--Continued

In a single report covering principal or major work by one or more named authors, a supplemental or subordinate contribution on a related phase may be credited by adding to the main title and authorship the words "With a section on (subject) by (author)."

In a single report published as a complete "numbered publication" the author or authors are named on the title page and at the top of the first page of the text. Except upon appropriate justification and upon specific approval by the Director, the number of authors to be named will be controlled by the following rules: Not more than four principal authors are named if the report is almost entirely the work of one branch. The device described in the immediately preceding paragraph should be used where appropriate, to reduce the number of names of principal authors. If it is felt that more than four principal authors should be named, and if the subject presentation would not be damaged, consideration should be given to changing the single report into a composite-type report with authorship credit for individual chapters. If two or more branches collaborated in preparing a manuscript report, if the report has more than four potential authors, and if the composite-type report cannot be adopted, the authors of the printed report will be named from those persons who had immediate and active charge of distinctive fields of activity that formed an important and integral part of the investigation; even in such cases it is expected that only rarely will there be occasion to name more than four authors. Where more than four persons could be considered as authors of a single report but they cannot all be named in accordance with the above provisions, three of them will be named followed by "and others," and those not named should be given due credit in the text or perhaps in a preface. In all cases, the chief of the lowest organizational unit supervising all the Survey authors will recommend the order and number of names listed. Quoted from U.S. Geological Survey (1958, p. 21-23).

average discharge.

The term "average discharge" as used by the Geological Survey is defined as the arithmetic mean of all yearly discharges of record or for any specified period of years. It is not a true mean, as no extra weight is given to years having 366 days; however, the error introduced is so small that it can be ignored. A yearly mean discharge is a true arithmetic mean, as it is the sum of all the daily mean discharges divided by the number of days in that year. Quoted from U.S. Geological Survey (1958, p. 44).

bad.

See "good, bad; well, poor," p. 24.

based on,
on the basis of.

Care is needed to distinguish the participial phrase "based on" and the prepositional phrase "on the basis of." The former modifies the noun in the main clause of the sentence; the latter modifies the verb.

Based on [On the basis of] measurements made on photographs, Brown estimates * * *. ("Based on" would modify "Brown.")

Brown's estimates were based on measurements made on photographs.

Even where grammatically correct, a "basis" phrase may be less desirable than a concrete phrase.

The rocks on the basis of [If classified by] size of grain [the rocks] may be divided into sandstones and conglomerates.

The conclusions stated seem to be warranted *on the basis of* [by] the data presented. Quoted from U.S. Geological Survey (1958, p. 154).

beautiful,
splendid.

Enthusiasm leads some writers to apply such terms as "splendid" and "beautiful" to fossils, exposures, specimens, and other things that have neither splendor nor beauty in the primary sense of the words. It is easy to find more appropriate terms, such as "excellent," "remarkable," "well exposed," or "well preserved." Quoted from U.S. Geological Survey (1958, p. 151).

because (reason is because).

Because means *for the cause that* or *for the reason that.* Therefore, "The reason is because . . ." is both ungrammatical and illogical.

> **Not: The *reason* I took this course is *because* I wanted to improve my writing.**
> **But: The *reason* I took this course is *that* I wanted to improve my writing.**
> **Or: I took this course *because* I wanted to improve my writing.**

Quoted from Spurlock and Dawson (1969, p. 221).

becomes.

See "grows, become," p. 24.

begin and open, end and close.

The verb "open" means primarily to move something from its shut position; the opposite verb is "close." This pair and the corresponding nouns "opening" and "close" are often used in a figurative sense where "begin" (or "beginning") and "end" would be more nearly exact and therefore preferable, on the general principle that a word that has only the intended meaning is better than a word that has several meanings.

> In this subarctic region the mining season *opened* [began] about the middle of May and *closed* [ended] 4 months later; however, somes mines were opened earlier and were not closed until the first of October. Quoted from U.S. Geological Survey (1958, p. 154).

begin, inaugurate, initiate.

See "stilted and showy writing," p. 44-45.

both, different.

"Both" and "different" are useful words if needed, but be sure they're needed; they are not needed in these sentences:

> Both branch chief and project leader will depart in opposite directions.
> The Survey occupies more than 30 different buildings.
> Bill Macy has married Samantha Harper, and they both are honeymooning in Hawaii. Quoted from Bishop, Eckel, and others (1978, p. 241).

but also.

See "parallel construction," last two sentences, p. 34.

by.

Overlain by (not with). See "prepositional idioms," p. 37.

calculate, compute, determine, estimate.

"Calculate" and "compute" are both akin to "reckon" and mean to determine by mathematical processes. "Calculate" seems to be preferred when the process is intricate and the result arrived at is problematical, as the distance from the earth to the sun. "Compute" implies that the material for reckoning is known data or actual figures.

"Estimate" may imply calculation or computation, but it implies also use of one's judgment or experience and a result that is not necessarily exact. "Determine" in the foregoing sense means to find out exactly, to ascertain, or to fix precisely. It should not be used loosely for "compute," "calculate," or "identify." The last should be used in identifications of fossils, minerals, and rocks. (See "Identify, determine," p. 180.) Quoted from U.S. Geological Survey (1958, p. 175-176).

***

capitalization.

Capitalize the name of a phylum, class, order, family, or genus, but not the name of a species, subspecies, or variety—Arthropoda, Crustacea, Foraminifera, Hypoparia, Agnostidae, *Agnostus*, *Agnostus canadensis*, *Diplotrypa westoni*, *Epigaea repens*, *Quercus palustris*.

Coined paleontological terms derived from proper names are not capitalized—aviculoid, mesodontine, foraminifer.

Do not capitalize derivatives of proper names no longer identified with the names from which they were derived.

babbitt metal	nicol prism, crossed nicols
canada balsam	pitot tube
carlsbad twins	plaster of paris
china clay	portland cement
diesel engine	roman type
harveyized steel	taintor gate
india ink	venturi tube

Do not capitalize a common noun used with a date, number, or letter merely to denote time or sequence or merely for the purpose of reference, record, or temporary convenience. "No." or "number" is used before a figure only where necessary: "Well 3 (not well No. 3) is 85 feet deep." "Of all the analyses, No. 3 (or that of water from well 3) shows the highest fluoride content."

analysis 15	exhibit A	section 10
appendix A	figure 7	species 2
bed 4	level 2	table 19
chapter 3	page 245	test hole 4
class I	plate 23	type F
collection 6812	sample 156	well 162

The following examples will serve to interpret the rules of capitalization for titles of persons and names of units of the Geological Survey as they are used in the texts of reports published by the Survey: Director, Geologic Division, Conservation Division, Water Resources Division, Topographic Division, Mineral Deposits Branch, Ground Water Branch, Quality of Water Branch, Geologic Names Committee, chief geologist, chief hydraulic engineer, chief topographic engineer, chief, party chief, district engineer, district geologist.
Quoted from U.S. Geological Survey (1958, p. 192).

cases.

See "abstract terms," p. 4.

character.

See "abstract terms," p. 4.

chemical terms and symbols.

Chemical terms, rather than symbols, are generally used in the text. Symbols are used in tables and equations and may be used in text where it is desirable to avoid complex terms. Quoted from Bishop, Eckel, and others (1978, p. 170).

citation of references.

See "references, examples of," p. 41.

clauses.

See "restrictive and nonrestrictive clauses," p. 42.

cliches in letters and memorandums.

Acknowledge. In informal writing, try substituting "Thank you for your letter of May 16 . . . " for "This will acknowledge your letter of May 16."

Enclosed herewith. *Herewith* is redundant. If something has been *enclosed*, then it certainly is *herewith*. *Transmitted herewith* is acceptable, though.

The master sheets you requested are *enclosed*.

Enclosed please find. Considered by many writers to be greatly overused and even somewhat absurd. They maintain that one cannot *instruct* another to *find* something, since *find* implies coming upon something *by chance*. And they express confidence that, if the article is enclosed, the reader *will find it* without being so instructed.

Not: *Enclosed please find* a schedule of the meetings.
But: *Enclosed is* a schedule of the meetings.
Or: The *enclosed* schedule of the meetings . . . .

Feel free to. Considered old fashioned and patronizing by many writers. And many readers are antagonized by it.

Not: Please *feel free to* contact this office for any further information about the matter.
But: If you would like further information about the matter, please let us know. (please write us)

For the purpose of. Like *in order to* and *at the present time* is classified as being unnecessarily wordy (even though the constant use of these expressions makes them inconspicuous unless the writer has trained his eye to spot such wordy constructions so that he can write more concisely).

He called the conference *for the purpose of* discussing the 19__ budget plans. (Substitute *to discuss*)

In order to meet the deadline, he asked the group to work overtime. (Substitute *to meet* the deadline)

We are able *at the present time* to send you 25 Writing Handbooks. (Substitute: We can send you *now*. . . .

***

Meet with your approval. This expression is limp from overuse.

Instead of: We hope our actions *will meet with your approval*.
Substitute: We hope you will *approve* our actions.

Self-addressed. Many authorities have fun discussing the fact that there is no such thing as a "*self-addressed*, stamped envelope." What the writer means is "an addressed, stamped envelope."

Thanking you in advance. Though often used to add to the tone of the letter, this phrase is considered by most readers to be presumptuous, if not insulting. To "thank" a person "in advance" is to put him under obligation to grant you the favor you are asking.

Cliches quoted from Spurlock and Dawson (1969, p. 218, 228-229, 234, and 243).

close proximity.

Delete "close." Proximity means close.

coherence.

Coherence requires that the parts of the report be arranged logically and that they be tied together in a way that will show their exact relation. Not only should words, phrases, and clauses be arranged in sentences in an order that will easily lead the reader forward, but the sentences themselves should be properly grouped in paragraphs, and

coherence. --Continued

the paragraphs should be presented in logical sequence under suitable topic headings. Coherence between parts can be attained by ending a part with a word, phrase, or sentence that points both forward and backward, or by a simple statement of the subject in the first sentence of the new part. Quoted from U.S. Geological Survey (1958, p. 135).

cold or hot temperature.

See "temperature (cold or hot)," p. 46.

comma in compound sentences.

See "punctuation," p. 38.

comma in dates.

See "numerals," p. 31, item 7.

comma in elements in series.

See "punctuation," p. 39.

comma in numbers.

See "numerals," p. 30-31.

comparatively, relatively.

"Comparatively" and "relatively" have come to mean "rather" or "a small amount," but the words are more informative if a comparison or a relation is shown. Compared to what? Relative to what? Quoted from Bishop, Eckel, and others (1978, p. 242).

compare.

See "prepositional idioms," p. 37.

comparisons.

Comparisons, if correctly used, clarify the writer's message. Omission of necessary words, as in the following sentences, confuses the reader:

The schist is much closer to the settlement than [to] the river.
The average annual precipitation in the area is less than [that in] other parts of Wyoming.
The purpose and scope of this report are different from [those of] most previous reports.
Uranium is commercially more important than any [other] element produced in the area. Quoted from U.S. Geological Survey (1958, p. 137).

The instruments on Skylab are more complex than [those] on ERTS. Quoted from Bishop, Eckel, and others (1978, p. 238). The bracketed words in the preceding sentences are needed.

completeness.

Each sentence should be complete, both in thought and in construction. The reader should not have to guess at the author's meaning or have his thought distracted by the omission of words. Note the improper or undesirable omission of words in the sentences given below.

Article

I consulted the secretary and [the]' president of the mining company.
The drilling rig and [the] pipe carrier were destroyed.
Access to the ore was provided by a drift and [a] winze.

completeness. --Continued

Connective "that"

These sediments show [that] the Black Point basalt is as old as the Waimanalo stand of the sea.

He believed [that] the terrace was elevated again.

The analyses indicate [that] the water has a high concentration of dissolved solids.

Infinitive or sign of infinitive

The outcrop is reported [to be] traceable for 70 feet.

The writers intend to delineate the areas that are anomalously radioactive and [to] present chemical analyses.

Possessive

My packer and [my] field assistant accompanied the mapping party.

Preposition

Chalcopyrite is found on the surface and [in] the fissures.

Pronoun

The work has been carried on under the general supervision of John Smith, [who was] assisted by William Jones.

Local inhabitants spoke of large masses of silver ore which were exposed at the surface, and [which] were exploited for years.

Verb or part of verb

This program is important and [is] appreciated by those affected.

The work was [done] for the State Survey.

These surveys were [made] for economic reasons.

Quoted from U.S. Geological Survey (1958, p. 136).

compose, consist, comprise, constitute.

In the sense of this comparison, "compose" requires a plural subject, as in "The Pleistocene and Recent epochs compose the Quaternary period." The subjects go together to form or make up the thing expressed by the object. "Consist of" is synonymous with the passive form of "compose," as in "The rock is composed of (or consists of) plagioclase, orthoclase, and accessory hornblende and biotite." "Comprise," which is similar to "include," should have as its subject the whole that is made up of the parts that are its object, as in "The Quaternary period comprises the Pleistocene and Recent epochs." "Constitute" is similar to "compose," as in "Feldspar, quartz, and dark accessory minerals constitute (or compose) the typical granite." Quoted from U.S. Geological Survey (1958, p. 177).

compounding.

Words combined to form a unit modifier immediately preceding the term modified are generally hyphened.

fire-tested material	thin-bedded limestone
fire-clay deposit	red-bed facies
drought-stricken area	bluish-gray shale
flood-plain deposits	light-green clay
ground-water study	blue-green algae
surface-water study	water-table divide

Write without a hyphen a two-word unit modifier the first element of which is a comparative or superlative.

better drained soil	larger sized grains
highest priced coal	best preserved specimen

Write without a hyphen a two-word unit modifier if the first word is an adverb, as in "often heard phrase" and "carefully prepared report." "Well-defined curve" and "ill-defined curve" are exceptions.

In stratigraphic sections, well logs, and similar lists, unit modifiers follow the noun they modify and are hyphened according to the rules used when they precede the noun.

compounding.--Continued

Sandstone, bluish-gray, coarse-grained, highly shattered
Sandstone, dark-gray, thick-bedded, fine-grained

A chemical term used as a unit modifier is not hyphened: calcium bicarbonate water.

Write without a hyphen a compound predicate adjective the second element of which is a past participle.

The area is drought stricken.
The granite is contact metamorphosed.
The sand is fine grained.
The coal is high priced.

Write without a hyphen a compound predicate adjective or predicate noun the second element of which is a present participle.

The sandstone is ledge forming.
The land is used for cattle raising.

A compound color term is not hyphened unless the term becomes a unit modifier.

The shale is olive green to blue green.
The clays are brick red and chocolate brown.

Quoted from U.S. Geological Survey (1958, p. 193). See "Guide to Compounding," U.S. Government Printing Office (1973).

Units of measure combined to form a unit modifier should not be abbreviated (Bishop, Eckel, and others, 1978, p. 233; U.S. Government Printing Office, 1973, p. 75, item 6.15; p. 78, item 6.36.

compound sentences. See "punctuation," p. 38 and 39.

comprise. See "compose, consist, comprise, constitute," p. 14.

conceptualize. See "nouns as verbs," p. 30, and "vogue words," p. 51.

conditions. See "abstract terms," p. 4.

conducted. See "stilted and showy writing," p. 44.

conform. See "prepositional idioms," p. 37.

connective "that." See "completeness," p. 14.

consensus (of opinion). "Of opinion" is redundant; "consensus" means "agreement of opinion."

consist. See "compose, consist, comprise, constitute," p. 14. and "prepositional idioms," p. 37.

constitute. See "compose, consist, comprise, constitute," p. 14.

contains, has, holds. "Contains" means to have within, and "holds" means to have the capacity (or ability) to contain or retain. "Has" implies possession more than does "contains." Quoted from U.S. Geological Survey (1958, p. 177).

contamination, pollution. Although these two words are used in wide degrees of meaning by technical writers describing quality of ground water and surface water, the writers would generally be

contamination, pollution. --Continued

accurate and better understood if they simply reported their data; for example, the concentrations of calcium, magnesium, chloride, sulfate, and other dissolved constituents. The readers can interpret the data in terms of drinking-water and other water-quality standards.

continual, continuous.

"Continual" refers only to time, and it means always going on or recurring at short intervals and literally or figuratively never ending. "Continuous" refers to both time and space, and it means that there is no break between the beginning and the end, or between one limit and the other. Quoted from U.S. Geological Survey (1958, p. 177).

continued, extended.

In the sense most frequently meant in Survey writing, "continued" suggests an unbroken course or the lack of an end to the process it refers to, as in "The stream has continued to flow ever since." "Extended" means lengthened in space or time and figuratively increased in scope, as in "Mineralization extended into the country rock." Quoted from U.S. Geological Survey (1958, p. 177-178).

contour, contour line.

In text, a distinction should be made between "contour" as applied to the surface of the earth and "contour line" as applied to a topographic map.

> The greater resistance of the Paleozoic rocks is indicated by the contour (*or* contours) of the hills.
> On the map the 1,000-meter contour line is near the shore of the lake.

General usage among engineers allows use of "contour" instead of "contour line" if a specific contour is mentioned.

In a map explanation, where there is no possibility of misunderstanding, "contour" may stand for "contour line," as in the explanation beneath the symbol for a contour line: "Contours drawn on top of Precambrian rocks; interval, 200 meters" (omit final period on maps).

Numerals indicating altitude (or elevation) on contour maps, and similar numerals on other illustrations, by convention are printed without a comma if they are of four digits, with a comma if they are of five digits or more; in text, however, numerals of four digits or more indicating altitude are printed with a comma. Quoted from Bishop, Eckel, and others (1978, p. 242).

contrast (verb, noun). See "prepositional idioms," p. 37.

conversion factors. See "metric units," p. 29, and Finch and Aronson (1982, p. 175-178).

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correspond. See "prepositional idioms," p. 37.

covers (verb). This word is often loosely used; *for*, *on*, or *about* may be substituted.

Instead of: The enclosed check *covers* your expenses to and from the Regional Office.

Say: The enclosed check *is for* your expenses to and from the Regional Office.

Instead of: We are enclosing pamphlets *covering* the Summer Management Institutes.

Say: We are enclosing pamphlets *describing* the Summer Management Institutes.

Quoted from Spurlock and Dawson (1969, p. 224).

crop out. See "outcrop, crop out," p. 33.

daily mean, mean daily. The terms "daily mean" and "mean daily" should not be used indiscriminately, nor should "monthly mean" and "mean monthly," "annual mean" and "mean annual," etc. The daily mean discharge for any day is defined as the mean discharge for that one day; the mean daily discharge for any one day, October 10, for instance, is the arithmetic mean of the discharge on all October 10's of record, or during a specific period of years. Likewise, the monthly mean discharge for October 1951 is simply the arithmetic mean of the 31 individual daily mean discharges during that month, whereas the mean monthly discharge for October is the arithmetic mean of all October means of record or during a specific period of years. In Survey reports the term "daily discharge" is used to describe the daily mean discharge, and the terms "monthly discharge" and "yearly discharge" are used similarly. Inasmuch as there will be but a few occasions when the term "mean daily discharge" will be appropriate, Survey authors should use the word "mean" only when it is necessary to define the thought adequately, and even then perhaps the word "average" would be more appropriate in many places. However, in writing of temperature, "mean" will be needed more frequently for consistency with the usage of the Weather Bureau, and the distinction between "daily mean" and "mean daily" described above should be maintained. Quoted from U.S. Geological Survey (1958, p. 44).

dates. See "numerals," p. 31, item 7.

degree mark. The degree mark should be used with figures in statements of dips and strikes, and the terms of direction should be abbreviated: "A dip of 10° SE. (or 10° S. 35° E.)"; "the strike is N. 55° E. (or N. 45°–70° E.)"; N. 55°30′25″ E.; but "the dip is southeast"—that is, terms of direction should be spelled out unless figures are given. Quoted from U.S. Geological Survey (1958, p. 205).

differ. See "prepositional idioms," p. 37.

different. See "both, different," p. 10, and "prepositional idioms," p. 37.

discharge. See "flow, discharge, streamflow, and runoff," p. 21, and "average discharge, p. 9.

downstream from. Site 5 is downstream "from" (not "of") the dam.

drainage basin. See "watershed, divide," p. 51.

due to, owing to. A simple grammatical rule will clarify the use of "due to" and "owing to." "Due to" is used as an adjective and must refer definitely to a noun or to a word group used as a noun; "owing to" modifies a verb.

A safe general rule for use of "due to" is: Use some form of the verb "to be" before it or place it next to the noun it modifies.

Damage due to the cloudburst was extensive.

Damage was due to the earthquake.

The Whittier School was damaged by the earthquake, owing (not due) to the fact that the building stood on made ground. ("Because the building stood on made ground" is equally clear and less cumbersome.)

The line of strike of each fault is very crooked, *due* [owing] to the fact that the faults traverse a rugged country. (Or better, "because the faults traverse * * *.")

This energy is immediately due to gravitation, but it is remotely *owing* [due] to the sun's heat.

Due to [Owing to, Because of] irrigation, the discharge had increased *by 1917* to 5,000 cubic feet per second [by 1917].

"Due to" is correct where "attributed to" could be used. "Owing to" is correct where "because of" could be used. Quoted from U.S. Geological Survey (1958, p. 158).

during the period 1941-70. "During 1941-70" is adequate.

elements in a series. See "punctuation," p. 39.

elevation. See "altitude, elevation," p. 6.

emphasis. The break in the continuity of some sentences not only puts unemphatic words in the place of emphatic ones but detaches the final clause from the sentence, as in the following examples:

The deposits are composed of well-stratified rocks but [contain numerous] large irregular boulders *are numerous*.

The district has been intensely glaciated and [thus shows] two distinct types of topography *exist*.

The ore in this locality is of rather low grade, and very little mining [of it] has been attempted.

The coal-bearing beds are not overlain by glacial gravel, *so deeper weathering has taken place* [and therefore have been more deeply weathered]. Quoted from U.S. Geological Survey (1958, p.145).

encounter. In its primary sense "encounter" means to meet with hostile intent or to meet face to face. It is commonly misused as follows:

encounter. --Continued

The samples were *encountered* [found] near Red Rock Lake.

The formula was *encountered* [found, seen, discovered] by Jones in a textbook by Smith.

The effect has been *encountered* [observed] in samples from placer deposits.

The word is used correctly as follows:

Jones encountered a brown bear in Alaska during the field season of 1956.

Quoted from U.S. Geological Survey (1958, p. 158).

enrich (verb).

The verb "enrich," in the sense of improving life or a product (as bread enriched with niacin and iron), is a useful word, but some writers use it in sentences where other words would be better. For example, in the sentence "The sluggish flow prevents transport of lead-enriched particles from the east lagoon to the west lagoon," did the writer mean "lead-coated particles"? The sentence "Constituent concentrations that were higher in the west lagoon than in the east lagoon included fluoride, *** and silica." was followed by "Seepage from landfills north and south of the lagoons may have caused the enrichment***." Did the writer mean "may have caused the higher concentrations"?

en-rich \in-'rich\ *vt* [ME *enrichen*, fr. MF *enrichir*, fr. OF, fr. *en-* + *riche* rich] **1** : to make rich or richer ⟨~*ing* himself in the stock market⟩ ⟨~*es* his cultural life by going to museums, concerts, and plays⟩ **2** : ADORN, ORNAMENT ⟨~*ing* the ceiling with frescoes⟩ **3 a** : to make richer in some quality ⟨~ the gravy with a little flour browned in butter⟩ **b** : to make (soil) more fertile **c** : to improve (a food) in nutritive value by adding nutrients (as vitamins or amino acids) and esp by restoring part of the nutrients wasted in processing **d** : to increase the proportion of a valuable or desirable ingredient in ⟨~ uranium in uranium 235); *also* : to add a desirable substance to ⟨~ natural gas⟩ **4** : to expand (a course of study) by increasing the variety of subjects and the depth of treatment ⟨an ~*ed* curriculum for the brighter students⟩ — **en-rich-er** *n* — **en-rich-ment** \-'rich-mənt\ *n*

By permission. From Webster's New Collegiate Dictionary © 1981 by Merriam-Webster Inc., publisher of the Merriam-Webster ® Dictionaries. See "vogue words," p. 51.

entirely.

See "quite," p. 39.

essential.

See "prepositional idioms," p. 37.

essential and nonessential modifiers.

Essential modifiers are not set off by commas; nonessential modifiers are. In the following examples essential and nonessential modifiers are indicated by quotation marks:

The factors "that influence the formation of huttonite and thorite" are not known. (Essential.)

Uranium forms no silicates "that contain U^{+4}," other than coffinite, but does form a number of uranyl silicates. (Essential.)

***

The alteration is of two types, "which operate concomitantly." (Nonessential.)

The element thorium, "which was named after Thor, the Scandinavian god of war," was discovered in 1828. (Nonessential.) Quoted from U.S. Geological Survey (1958, p. 198). See "restrictive and nonrestrictive clauses," p. 42.

essentially. "Essentially" means necessarily or indispensably. As used in scientific writing in the sense of principally, chiefly, mainly, virtually, in effect, most of, and almost, "essentially" is a poor choice. "Most of the formation is limestone" is preferable to "The formation is essentially limestone." Generally, in geologic writing, use of the adjective form in such expressions as "essential minerals"—meaning minerals that are invariably present in a particular rock, as quartz and orthoclase are in granite—is safe from error. Quoted from U.S. Geological Survey (1958, p. 178).

estimated. Use of estimated as an adjective is questionable in the following sentence: Estimated average annual recharge is 6.4 acre-feet per year. Instead, say, "Average annual recharge is estimated to be 6.4 acre-feet per year."

euphony and alliteration. Euphony—a "harmonious succession of words"—is as desirable in scientific reports as in other writing; lack of euphony may divert the reader's attention from the substance to the style of a paper. Examples of alliteration, which makes writing conspicuous and reading difficult, are given below.

Crustal movements crushed and crumpled the Cambrian rocks.
The interval that intervened.
A much larger and longer lived lake.
Not uncommonly conglomeratic.
Further fissuring, faulting, and fracturing.
Conglomerates with well-waterworn polygonous pebbles.
A somewhat similar series of sediments.
Analyses in uniform form.
As erosion proceeded the ore became shattered and scattered through the clay.
Inasmuch as much the same characteristics.
Around these mountains lie low-lying lands.

Quoted from U.S. Geological Survey (1958, p. 187).

event. This word should not be used for affair, happening, and incident unless what these words represent is particularly noteworthy (Department of the Army, 1959, p. 25). Do not say, "storm event."

exist. See "emphasis," second example, p. 18.

existing. *** greater than those ~~existing~~ in the aquifer.

extended. See "continued, extended," p. 16.

facility. Some writers substitute "facility" for "hospital," "jail," "plant," "refinery," and other precise words. See "stilted and showy writing," p.44, and "vogue words," p. 51.

featheredge, knife edge. The terms "featheredge" and "knife edge" may be applied to the edge of a rock unit that thins to extinction. The terms are no longer used as a substitute for zero in describing a range in thickness: "The unit ranges in thickness from 0 to 13 feet," not "The unit ranges in thickness from a featheredge to 13 feet." Quoted from U.S. Geological Survey (1958, p. 160). Also see "range, vary," p. 40-41.

fewer, less, lesser, smaller.

"Fewer" and "less" are frequently confused. "Fewer" is the comparative form of "few" and denotes a difference in number of units or individuals; it must modify a plural noun, as in "This rock has fewer crystals of pyrite than that one." "Less" means not so much in amount, degree, weight, value, and such, as in "This water contains less sodium than that one"; less than a bushel, but fewer than three apples. "Lesser" is the comparative form of "less" and means not so great, important, or significant as the thing compared: the greater amount, the lesser amount. "Smaller" refers to size or quantity. Quoted from U.S. Geological Survey (1958, p. 179).

finalize.

Another overused "ize" word.

See "nouns as verbs," page 30, and "vogue words," page 51.

first draft.

Most authors wisely read and work over their manuscripts many times. An author will find it helpful to check for logical order of treatment, prominence given to significant features, completeness, accuracy, irrelevant material, confusing statements, and repetition, as well as for compliance with the requirements and suggestions given in this volume. Quoted from U.S. Geological Survey (1958, p. 10).

first or third person.

It (the report) is written in either the first or third person but is consistent throughout in this respect. A good rule to keep in mind is, "The subject matter rather than its author needs emphasis." Quoted from U.S. Geological Survey (1958, p. 20, item 16b).

flow, discharge, streamflow, runoff.

The terms "flow," "discharge," "streamflow," and "runoff" have been used rather loosely, and sometimes indiscriminately, in Survey reports and in hydrologic literature in general. It seems desirable to define these words for Survey use so that each will carry a distinctive meaning. The following definitions are suggested, in order from the most abstract to the most concrete:

"Flow" means fluid motion and is the most general of all the terms. It can be used appropriately to describe the motion of liquids and gases under any conditions, in a canal or pipe, on the land surface, or below the surface.

"Discharge" means outflow. The use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe, from an aquifer, from a lake, or from a drainage basin. If the discharge occurs in some course or channel, it is proper to speak of the discharge of a canal, of a river, or of a well. It is proper also to speak of the discharge of a canal or stream into a lake, a stream, or the ocean.

"Streamflow" is the discharge that occurs in a natural stream course. Although the term "discharge" can be applied to the flow of a canal or an aquifer, the word "streamflow" uniquely describes the discharge in a surface stream course.

"Runoff" is the part of the precipitation that appears in surface streams that are not regulated. Accordingly, it is the streamflow unaffected by artificial diversions, storage, and other works of man in

flow, discharge, streamflow, runoff. --Continued

or on the stream channels. Works of man undertaken within the drainage basin but not in or on the channels, such as land-management practices, may affect the amount of runoff from a given amount of precipitation, but the runoff is still equivalent to streamflow. Runoff is not equivalent to streamflow where the artificial works are in or on the channel; thus the distinction between streamflow and runoff depends on channel factors and not land factors. Streamflow data can be adjusted to compute runoff by incorporating adjustments for storage and diversions. Because these computations depend on interpretation and judgment, the term "runoff" should be reserved for use in reports in which there is opportunity to explain the nature of the adjustments, if any are required. In reports listing basic data exclusively the general term "discharge" or "streamflow" is more appropriate. Quoted from U.S. Geological Survey (1958, p. 44-45).

following (adj.).

The participle "following" is undesirably used for "after," as in the sentences "Following this there was a second period of uplift"; "Following the completion of this work nothing further was done." This use of "following" may be due to contagion from bad practice, as in the sentences "Mr. Kellerman went West following a prolonged illness"; "O'Brien left the place following his dinner." The phrase "during and following the interval" is objectionable both because "following" is not a preposition and because the similarity of ending makes "during" look like a participle.

"Following" is properly used as an adjective in the sense of "succeeding," as in the sentence "They began work on the following day," or to indicate something that is to follow immediately, as in "The analyses are given in the following table." Quoted from U.S. Geological Survey (1958, p. 160).

footnotes and headnotes to tables.

Raised numbers or raised lowercased letters are preferred to asterisks and other symbols. They may be written with a slash (for example, 2/) to avoid changing to a superscript typeface in a manuscript, but superscripts without shelf and slash should be used in the camera-ready copy for improved appearance. Where footnotes are attached to numerical values, they are typed to the left of the value to avoid appearing as an exponent. Quoted from Finch and Aronson (1982, p. 301).

Explanatory remarks pertaining to the title or to the whole table should be given in a bracketed headnote, written in telegraphic style, and centered just below the title. If the headnote is lengthy, as are those of some tables, it may not be bracketed. The footnote reference numbers of each succeeding table start with the numeral 1; they are indicated by superior figures ($^{1\,2\,3}$ . . .) and are written in numerical order from left to right across the page, beginning with the first line then going across each succeeding line. Leaders are used in the stub column and across the entire table, except that they are omitted from a last reading column or a first or last date column. Detailed instructions for the placement of footnotes, references, and leaders are given in the GPO style manual (1973, p. 202–203, 205).

The following tables are examples or adaptations that have been published in Survey reports.

Sample tables

SAMPLE TABLE A.—*Mean bulk densities of rock specimens in the Haile-Brewer area*

Lithologic unit	Number of samples	Mean bulk density (g/cm³)	Range of density
Intrusive rocks			
Granite	8	2.69	2.62–2.82
Do.[1]	10	2.65	2.62–2.69
Do.[2]	36	2.64	2.40–2.72
		[3] 2.65	
Gabbro	5	2.93	2.84–3.05
Do.[2]	7	2.98	2.91–3.03
		[3] 2.96	
Diabase	55	2.97	2.79–3.08
Do.[2]	13	2.91	2.86–2.98
		[3] 2.96	
Felsic hypabyssal rocks	12	2.58	2.38–2.69
Mafic hypabyssal rocks	4	2.92	2.92–3.07
Carolina slate belt rocks			
Sedimentary rocks	8	2.64	2.42–2.77
Do.[2]	5	2.61	2.40–2.81
Mica gneiss[2]	3	2.73	2.67–2.80
Volcaniclastic rocks	8	2.59	2.38–2.74
Do.[4]	13	2.79	2.63–2.99
		(2.84)	(2.70–3.05)
		[3] 2.69	

[1] Sloan (1908, p. 217-225).
[2] Waskom and Butler (1971, table 2, p. 2835).
[3] Weighted average mean.
[4] McCormick County, S.C., drill core samples as much as 300 feet below the collar elevation; figures in parentheses are powder-density values for the same samples and are not included in average.

Quoted from Bishop, Eckel, and others (1978, p. 84).

Table D.-- *Chemical analyses of water from typical middle-zone boreholes, Chad Basin, Nigeria*

[Results in milligrams per liter except for pH or as indicated]

Constituents and properties	Mbutta, Mafa District GSN 1648 [1]	Laraba, Gubio District GSN 1992 [1]	Garunda, Kanembu District GSN 2083 [1]	Nyau, Kanembu District GSN 2091 [1]	Sabsawa, Nganzei District GSN 1984 [1]	Shuari, Mafa District GSN 1643 [2]
Silica (SiO_2)	48	67	69	63	52	109
Aluminum (Al)	Trace	Trace	Trace	Trace	.03	Trace
Copper (Cu)	-----	------	------	----	-----	----
Iron (Fe)	.18	1.5	1.3	1.3	.6	.1
Manganese (Mn)	1.0	8.5	4.2	2.5	1.0	2.4
Calcium (Ca)	19	64	51	45	7	25
Magnesium (Mg)	4.0	37	23	20	3.7	19
Sodium (Na)	85	192	180	188	70	141
Potassium (K)	16	23	18	19	13	18
Bicarbonate (HCO_3)	183	170	237	243	160	268
Sulfate (SO_4)	61	449	320	319	43	180
Chloride (Cl)	32	112	88	88	23	41
Fluoride (F)	.3	.6	.6	.6	.10	.2
Nitrate (NO_3)	.6	0	13.3	13.3	.4	6.6
Dissolved solids, residue on evaporation	536	1,065	890	885	288	678
Hardness as $CaCO_3$	72	320	230	205	35	148
Free CO_2	-----	125	95	85	40	115
Specific conductance, micromhos per centimeter at 25° C	400	1,300	1,085	800	340	800
pH	6.6	6.2	6.4	6.4	6.4	6.3
Sodium adsorption ratio (SAR)	4.7	4.7	5.3	5.9	5.3	5.2

[1] Analyzed by Geol. Survey of Nigeria Lab., Kaduna, Nigeria.
[2] Analyzed by U.S. Geol. Survey lab., Washington, D.C.

Adapted from Bishop, Eckel, and others (1978, p. 88).

foreign words. See "Latin and other foreign words and phrases," p. 28-29.

former, latter. "Former" and "latter" are often misused. They should not be used where the reader will have to look back to find what they mean. A good general rule, instead of using them, is to repeat the words to which they would refer. Of course "former" and "latter" cannot be used if there are more than two antecedents, as in the sentence "The granite consists of quartz, orthoclase, and biotite, the former constituting two-thirds of the rock." Quoted from U.S. Geological Survey (1958, p. 160-161).

fractions. See "numerals," p. 30, item 3, and p. 31, items 6 and and 8b.

glacial till. The use of "glacial" with till is redundant. Till is glacially derived.

good, bad, well, poor. Instead of using indefinite, abstract descriptive terms such as "good," "bad," "well," and "poor," try to be specific.

A well-exposed body of typical granodiorite • • •	A 30-ft exposure of typical granodiorite • • •.
The best site on the planet for finding "fossil" water • • •	The most likely site on the planet for finding "fossil" water • • •

Quoted from Bishop, Eckel, and others (1978, p. 244).

ground water. The two-word form instead of "groundwater" is preferred by the Geological Survey. "Ground-water" is a unit modifier but is redundant in the following phrases: ground-water aquifer and ground-water flow in the aquifer.

grows, becomes. "Grows" is used undesirably for "becomes" in the sentence "The gravel is coarse near Portsmouth but *grows* [becomes] finer grained downstream." Obviously the particles do not "grow" by attrition. Similarly, "grows" is wrongly used in writing of processes and changes of condition where growth is not involved. Quoted from U.S. Geological Survey (1958, p. 179-180).

have, has. "Have" and "has" should be used as the principal verb, with discrimination. "Has" should be used in place of "contains" in the sentence "This water contains a higher mineral content," but "have" and "has" are used undesirably in the following sentences:

The deep erosion gives evidence that the rocks *have a* [are of] considerable age.
The alluvial soil *has* [contains] much sand and gravel.
The rocks *have a flesh color* [are flesh colored].
The sample had *had no exposure* [not been exposed] to the air.

Quoted from U.S. Geological Survey (1958, p. 157).

headings. Headings preferably should indicate the things described or discussed in the text; thus the italicized words in the following headings are superfluous:

Description of the Cretaceous rocks
Discussion of ore deposits
Statement of theories of origin of the ore
Description of the mines
Table showing lead produced in 1954

Quoted from U.S. Geological Survey (1958, p. 25).

hopefully.

Use of this adverb has become controversial. Some grammarians (Hook and Mathews, 1956, p. 292, and Hodges and Whitten, 1977, p. 424) say that adverbs can be used to modify not only verbs, verbals, adjectives, and other adverbs but also the rest of a sentence; for example, "Hopefully," our team will win the championship. Some professional writers, including Newman (1974, p. 49) and Jacobs (1982, p. 10), strongly disapprove of this use of the word. Here is what Jacobs thinks of this use of "hopefully":

> The champion of all current misuse, however, is "hopefully." Hopefully, we'll find a solution. Wrong! So wrong--but you hear it used this way all over the tube, even by members of the President's Cabinet.***To say "hopefully, we***" is gross. We can be hopeful, but we are not hopefully anything before a noun or pronoun. Quoted by permission of Harvey Jacobs, Hard Words for Graduates, Indianapolis News, March 25, 1982, p. 10.

An acceptable use of "hopefully" is illustrated in the following sentence: Waiting for her father and mother, the little girl stared hopefully into the crowd. Here, "hopefully" modifies the verb "stared."

Because "hopefully" is a "vogue" word, the careful writer might be interested in Fowler's (1965, p. 460) comment on the use of vogue words. See "vogue words," p. 51, and "adverbs," p. 5.

I and me.

The objective case of *I* is *me*. *Me* can be a direct object, an indirect object, an object of a preposition, an object of a verbal, or the subject of an infinitive.

≫ It was a pleasure for the engineer and *me* to review the book.

≫ This is a decision that must be made between you and *me* [not *I*].

identical.

See "prepositional idioms," p. 37.

idioms.

See "prepositional idioms," p. 37.

illustrations (maps).

Some of the items needed but overlooked are:

1. Names of counties, cities, streams, lakes.
2. Complete explanations of map symbols.
3. Hydrologic, geologic, and base credits.
4. At least 8-point type (all illustrations).
5. Commas in five-digit and larger numbers.

impact.

The "impact" of the law ***. "Effect" is a good replacement for the vogue word "impact."

impact (n.) means primarily the striking of one thing against another, a collision and, by extension, its effect on the object struck. Used figuratively in this last sense, it has become a VOGUE WORD. There is no need to multiply examples; some can be found in almost any day's newspapers. It will be enough to quote four that happen to present themselves at the time of writing. *As a senator he had been alarmed at the i. of the first Russian sputnik. / A committee is to be set up to investigate the i. of television on children. / Perhaps the best yardstick by which to measure the i. of the tax reliefs is. . . / Although the group profit before taxation is a record, the i. of a considerably higher charge for overseas taxation has resulted in a lower net profit.* In the first quotation (where the writer is referring to the reaction of American public opinion to the Russian achievement) the metaphor is not yet 'dead' enough (see METAPHOR I) to be used without incongruity of a moving physical object. In the second the natural word to which i. is preferred is *effect*, and in the third *incidence*. In the fourth i. is used otiosely, as vogue words tend to be (cf. OVERALL); the omission of *the i. of* would leave the sense unchanged and improve the style.

Quoted by permission. From A DICTIONARY OF MODERN ENGLISH USAGE, second edition, p. 270, 1965, by H. W. Fowler, revised and edited by Sir Ernest Gowers. © Oxford University Press 1965. See "vogue words," p. 51.

impersonal construction.

Beginning sentences with the impersonal constructions "There is," "There are," and "It is" not only may multiply words but also may have the effect of putting in an inferior place a subject that preferably should stand at or near the beginning of the sentence. Some sentences of this kind are listed below.

There are many other primary minerals contain*ing* phosphorus.

There are [At] some places *where* lignite beds are exposed.

There has been some [of the faults are later than] *faulting subsequent to* the deposition of the ore.

It is believed that these vugs probably represent openings *which were* formed by recent faulting.

It is the belief of the miners [believe] that the ground now being worked may be a slide.

There is a probability that [The gold content of] some of the veins may have [been] *had their gold content* increased by enrichment.

There is [The ash contains] no quartz *in the ash* and *it* is probably andesitic *in composition*.

There is [The outcrops afford] little direct evidence *from outcrops* of the faulting.

There is also a difference in the slope of the valley floors. (Write, "The valley floors differ also in slope," for the context showed that "slope" was the term to be emphasized.) Quoted from U.S. Geological Survey (1958, p. 146).

implement.

The verb, meaning to carry out (a contract, etc.), is of Scottish origin.***Since then (1933) it has taken England by storm and become almost a vogue word with politicans, officials, and the Press. Undertakings, recommendations, promises, and obligations are never now fulfilled or carried out or observed***; implemented must always be the word. An occasional change would be refreshing.

Quoted by permission. From A DICTIONARY OF MODERN ENGLISH USAGE, second edition, p. 270, 1965, by H. W. Fowler, revised and edited by Sir Ernest Gowers. © Oxford University Press 1965. See "vogue words," p. 51.

important, interesting.

"Important," "importance," and "interesting" are greatly overused by some writers. As a rule, "important" is not the appropriate word unless it is accompanied by some term denoting why or how the

important, interesting. --Continued

the thing described is important, as "commercially important." It should not be used for "large," "abundant," "conspicuous," "valuable," or other words of clearly defined meaning. "Interest" is a mental attitude of the observer, and the adjective "interesting," though applied to an object, relation, or other phenomenon, describes only the observer's relation to it. For clear thinking as well as clear writing, a writer should fortify the use of "interesting" or "important" by pointing out the relation which endows the indicated phenomenon with interest or importance. When that has been done the need for the adjective often disappears.

The following examples show some remedies for this overuse:

> The *most important* [best? most frequently traveled?] route across the region * * *.
>
> The most *important* [abundant] igneous rock in this area * * *.
>
> These streams, named in the order of their *importance* [size? accessibility?], are * * *. Quoted from U.S. Geological Survey (1958, p. 162).

inanimate objects. See "suffering rocks and other fallacies," p. 45.

inaugurate. See "stilted and showy writing," p. 44-45.

independent of. See "prepositional idioms," p. 37.

infinitive. See "split infinitives," p. 44, and "verbals," p. 49-50.

infinitive or sign of. See "suffering rocks and other fallacies," p. 45.

initial (adj.). This word is overworked; "first" is not used enough (Department of the Army, 1959, p.26).

initiate. See "stilted and showy writing," p. 44-45.

in preparation, in press.

*** The "in preparation" status of a manuscript is not ended at the date of its approval by the Director. It is ended when a manuscript to be published by the Survey is sent to the printer or when a manuscript to be published outside the Survey is accepted for publication; thereafter, it may be cited as "in press" in bibliographic or reference lists. These designations should be verified just before page proof is returned to the printer. "In press" is placed in parentheses after the name of the publisher and series. Quoted from U.S. Geological Survey (1958, p. 106).

in search of. See "prepositional idioms," p. 37.

instances. See "abstract terms," p. 4.

in the study area. This phrase is overworked in Geological Survey reports. It is generally superfluous in sentences such as the one that follows: Most of the land "in the study area" is farmed. Unless stated otherwise, the discussion in a report is presumed to be about the study area.

italics. Use of italic type (indicated in manuscript by underscoring), should generally be reserved for:

1. Formal names of genera, species, and subspecies or varieties of plants and animals, as *Productus, Inoceramus fragilis, Ostrea congesta* Conrad, *Bulimina elongata subulata*. Names of families and higher groups are printed in Roman: Brachiopoda, Mollusca, Foraminifera.

italics.--Continued

2. Letter symbols in mathematical equations and most letter symbols used in physics. Chemical symbols, even in italic matter, are printed in Roman.
3. *See* and *See also* in indexes, glossaries, and like matter
4. Names of individual aircraft, spacecraft, and marine vessels:

The Apollo 15 lunar module *Falcon* * * *; the command module *Endeavor* * * *.
The successful completion of the mission of the B-29 Superfortress *Enola Gay* brought the Japanese representatives to the battleship *Missouri*.
The *Eagle* has landed.
The Skylab Earth Resources Experimental Package (EREP) high-density digital tapes * * *.
ERTS (Landsat) multispectral images have a variety of geological applications.
The U.S. Geological Survey research vessel *Don J. Miller* * * *

Quoted from Bishop, Eckel, and others (1978, p. 93).

its, it's. "Its" is the possessive; "it's" means "it is."

jargon. Sophisticated technical terms may convey in one word a concept that would otherwise require a long explanatory phrase. However, you should not overestimate your readers' familiarity with such terms, nor should you indulge your personal preference. Jargon has its place but reader interests must come first: Is the reader familiar with the specialized language? Does the jargon improve or impede an understanding of the text? Is the use of jargon merely a reflection of a lazy mental habit? Is it an indication of a desire to impress others with "inside talk?"

Think about your phrasing and don't be trapped by lazy language. Like the cliche, jargon was perhaps once fresh because it captured in a phrase the essence of a thought; but it may have become stale and meaningless through overuse. Quoted by permission of Bell laboratories (1979, p. 30-31).

knife edge. See "featheredge, knife edge," p. 20.

large numbers. See "numerals," p. 31, items 6 and 8.

last year, this year. An author should avoid the use of phrases like "last year," 'this year," "next year," "3 years ago." Before the report is printed "this year" may have passed, and "last year" may be "2 years ago." Write "in 1957"; "during the field season of 1957." Quoted from U.S. Geological Survey (1958, p. 163).

Latin and other foreign words and phrases. Foreign words and phrases are used unnecessarily by many writers where English terms would be suitable. Among these words and phrases are "videlicet" (viz), "id est" (i. e.), "exempli gratia" (e. g.), "débouchure," "in situ," "brochure." The following sentences can be improved by being rewritten entirely in English:

These oxides were carried away in toto.
Chalcocite enrichment is practically nil.
The surface bore prima facie evidence of freedom from erosion.

***

Latin and other foreign words and phrases. --Continued

Even the generally meaningless "etc." and "et al." can profitably be replaced in many sentences by significant English, as in "The gangue consists of quartz, *etc.* [and other minerals]"; "Damour, Hersch, *et al.* [and others]." Remember, also, that "etc." applies to things only and not to persons. In bibliographies and other listings of names use "and others," not "et al." Quoted from U.S. Geological Survey (1958, p. 187-188).

latter. See "former, latter," p. 24.

less. See "fewer, less, lesser, smaller," p. 21.

lesser. See "fewer, less, lesser, smaller," p. 21.

letters. See "cliches in letters and memorandums," p. 12.

like, as.

"Like" is a useful but troublesome word. Otherwise respectable writers from Shakespeare on have used it as a conjunction, but such usage is still frowned on by intellectuals. "***, as a cigarette should" may not be as catchy, but it's better grammar. Quoted from Bishop, Eckel, and others (1978, p.246).

When used to express similarity, like is a preposition and takes an object; as is a conjunction and introduces a clause.

The TIC apparatus case looks like the TI case.

Tests demonstrated that the vehicle performed as (not like) it should.

***

Quoted by permission of Bell Laboratories (1979, p. 39).

limited. See "stilted and showy writing," last paragraph, p. 45.

located. See "situated, located," p. 43.

long words. See "short words, long words," p. 43.

majority.

"Majority" is used improperly for "most" in many manuscripts. If the writer means about two-thirds, three-quarters, or nine-tenths he can use those fractions. Do not apply "majority" to a substance that is weighed or measured, as "the majority of the manganese." Quoted from U.S. Geological Survey (1958, p. 163).

maps. See "illustrations," p. 25.

mean daily. See "daily mean, mean daily," p. 17.

measurements. See "quantities, measurements," p. 39.

memorandums. See "cliches in letters and memorandums," p. 12.

merely. See "very, merely, simply," p. 51.

metric units, conversion factors.

Heading suggested for conversion-factor page: Factors for converting the inch-pound units used in this report to the international system of units (SI). Most units are singular; for example, inch, foot, and mile. An exception is million gallons.

modifiers. See "essential and nonessential modifiers," p. 19; "restrictive and nonrestrictive clauses," p. 42; and "strung-on modifiers," p. 45.

National Geodetic Vertical Datum of 1929 (NGVD) A geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada; formerly called mean sea level (Finch and Aronson, 1982, p. 227).

necessary. See "prepositional idioms," p. 37.

neighborhood of. See "vicinity of, neighborhood of," p. 51.

not only, but also. See "parallel construction," last sentence, p. 34.

nouns as verbs. Converting nouns into verbs is an easy process, often accomplished without a change in spelling or pronunciation or through the addition of *-ize*. Sometimes these words are used so often that they become acceptable in both spoken and written communication. But new words should not be invented arbitrarily, because such words tend to perplex rather than enlighten readers. Although *-ize* words have proliferated, especially in technical documentation, they should be avoided whenever possible.

poor	better
≫ *finalize* a report	*complete a report*
≫ *reflectorize* light	*reflect light*
≫ *prioritize* the items	*rank order the items*

Paragraph quoted by permission of Bell Laboratories (1979, p. 25). Examples adapted from same reference.

***

numerals.

2. Figures are used in text for both cardinal and ordinal numbers of "10" or more except for the first word of the sentence; most sentences can be so worded as not to begin with a number. Numbers under "10" are to be spelled out except for serial numbers and expressions of time, measurement, and money.

   U.S. Geological Survey Bulletin 1 was published in 1883.
   Petroleum came from 16 fields, eight of which were in two States.
   Each of the five girls earned $2 an hour.
   A team of four men ran the 1-mile relay in 3 minutes and 20 seconds.
   Ten percent of the population owns 70 percent of the wealth.
   First Congress; 82d Congress; 38th parallel; 141st meridian; first parallel

3. Fractions that are part of unit modifiers or that are joined to whole numbers are expressed in figures; fractions that stand alone are spelled out.

   one-eighth, three-fourths
   3½, 1¾ (*but* ½ to 1¾ pages)
   ½-inch pipe, ⅞-point rise, 0.9-inch spacing

4. Two sets of numbers should not be written in immediate succession. Instead of "The final survey makes the total distance of levels run in 1906 38,307 miles," write "The total distance of levels run in 1906 was 38,307 miles," or some other variation.

5. Indefinite expressions are spelled out. The words "nearly," "about," "around," "approximately" do not constitute indefinite expressions (GPO SM, 1973, p. 184).

   a hundred wells; nearly 100 wells; 115 wells

numerals.
--Continued

6. In text, "million" and higher orders are spelled out as illustrated.

   $12 million (*not* $12,000,000), *but* $12,649,042
   $2.75 billion; $2,750 million; $2¾ billion
   $500,000 to $1 million
   4 million years, *but* 400,000 years

7. In Survey reports, dates are usually written as shown below.

   March 3, 1879, is the official birthday of the U.S. Geological Survey. (Note comma after year.)
   March 6 to April 15, 1975 (*not* March 6, 1975, to April 15, 1975); April 1975
   For consecutive years, water years, fiscal years, and meteorological years, the contracted forms 1974–75, 1890–91, 1916–27, 1907–8 (*but* 1900–1901, 1895–1902) are used.

8. The following rules for use or omission of the comma in numbers are taken from the 1973 edition of the GPO style manual (p. 137):

   a. The comma is used to separate thousands, millions, and higher numbers of four or more digits. Thus: 4,320; 50,491; 1,250,000.

   b. The comma is omitted in built-up fractions, in decimals, and in serial numbers except patent numbers.

      1/2500
      1.0947
      page 2632 (but 2,632 pages)
      1721–1727 St. Clair Avenue
      Executive Order 11242
      motor No. 189463
      1450 kilocycles; 1100 meters (no comma unless more than four digits radio only)

Quoted from Bishop, Eckel, and others (1978, p. 90–91).

obvious, obviously.

Before using these words, thoughtful writers will realize that what they may believe to be obvious may not be obvious to their readers.

occur.

The word "occur," in the sense of "appear" or "be present," is a proper and useful word, but it is used in many places where other words would be better. It should be kept in mind that the word carries some connotation of randomness—something happening or existing without design. There is no good reason for using it in sentences like these—

Trees *occur* [grow] on these slopes.
The mines *occur* [are] in Pope and Hardin Counties.
Waterfowl *occur* [are found] here in enormous numbers.
A well-exposed occurrence of dolomite sheared and made slaty by faulting *occurs* [is well exposed] north of Pequea Creek. Quoted from U.S. Geological Survey (1958, p. 164).

often.

See "time and place," p. 48.

on.

"On" is superfluous in the following sentence: He arrived "on" Tuesday (Department of the Army, 1959, p. 26).

on the basis of.

See "based on, on the basis of," p. 9.

oral or written communication.

An oral or written communication is referred to in the text by placing in parentheses "oral communication" or "written communication," accompanied by the name of its author and, if necessary, by the date. In this category are included the following: (a) Data and opinions given orally; (b) correspondence; (c) file data, including memorandums, manuscripts, maps, and notes; (d) unpublished college theses; and (e) manuscripts that are in preparation. If there is good justification, an author may include in the text a reference to an unpublished thesis by giving there its title, name of its author, and name of the institution. For a thesis to be so cited it must be available to the public; such citations should be very few because unpublished theses generally are not conveniently available. *** Quoted from U.S. Geological Survey (1958, p. 105-106).

order of magnitude.

An "order of magnitude" refers to some value that is 10 times more than the preceding order or 10 times less than the succeeding order. "Several orders of magnitude" should not be used carelessly to say that one quantity is many, many times larger or smaller than another. "Two quantities are of the same 'order of magnitude' if one is no larger than ten times the other, but if one is one hundred times the other it is larger by two orders of magnitude" (WNI 3). Quoted from Bishop, Eckel, and others (1978, p. 248).

order of related words and phrases.

Related words and phrases should be kept together. Some writers misplace adverbs and adverbial phrases, especially the adverbs "only," "principally," "mainly," "chiefly," "alone," "also," and "too." Note the following sentences:

Their presence can *only* be determined [only] by tests.
The sediments were [derived] principally *derived* from quartzite.

***

Prepositional phrases also become misplaced, as shown in the following examples:

Under such conditions it is easy to see that [under such conditions] the commercial development of these deposits * * *.
In Indiana recent writers have classified the rocks [in Indiana] as Utica or Eden.

***

Occasionally an adjectival expression is misplaced, or is misused for an adverb, as well as being misplaced.

A *careful* sample of this rock was [carefully] taken for chemical analysis.
The granite was intruded during the *great* period of [great] structural deformation.
Leaves [little] room for *little* doubt.

In general a phrase that applies equally to two or more items should be given with the first and not with the last.

Mountainous in the western part [of the quadrangle] and level in the eastern part *of the quadrangle.*

The thickness ranges from 700 feet at the east side [of the area] to perhaps 1,600 feet at the west side *of the area.* Quoted from U.S. Geological Survey (1958, p. 139-140).

organization.

The organization of a report is determined by various factors; for example, the subject and the type of

organization. --Continued

study; the title, the purpose, and the scope of the report; and the individuality of the author (U.S. Geological Survey, 1958, p. 29). Some subjects can be presented by chronological, sequential, spatial, or comparative methods. Regardless of what method is used, it must relate to the subject, the objective, and the reader (Bell Laboratories, 1979, p. 5).

outcrop, crop out.

Because the noun "outcrop" may be mistaken at first sight for the verb "outcrop" (as in "The rock outcrops in the stream bed are surrounded by gravel"), the form "crop out" is preferable for the verb. Quoted from U.S. Geological Survey (1958, p. 164).

over, under.

"Over" and "under" are used in some phrases where "more than" and "less than" or "fewer than" obviously would be preferable. The use of "over" in the sense of "more than" and of "under" in the sense of "less than" or "fewer than" is not incorrect, but "over" and "under" should not be used where they might be confusing, as they are in some of the following sentences:

The burning has advanced along the coal bed for a distance of over 1,000 feet and under 1,000 feet of overlying material.

The ore mined generally lies under more than 20 feet, and in some places over 100 feet, of sand and clay overburden.

The dolomite dips eastward under over 20 feet of muscovite-biotite schist.

Even under the best conditions it was not profitable to mine coal under 2 feet thick or over 200 miles from market.

"Upward of" is also used undesirably for "more than," as in "The project will cost upward of a million dollars."

"Over" or "above" may be used in a misleading sense in such sentences as "Oxidation extends to depths *above* [below, of more than] 2,100 feet." Quoted from U.S. Geological Survey (1958, p. 164).

owing to.

See "due to, owing to," p. 18.

paragraph.

At least one sentence but usually a group of related sentences expressing a distinct thought. A few one- or two-sentence paragraphs may be useful in a report; however, they may also result in choppiness or suggest poor development of ideas (Bell Laboratories, 1979, p. 8-9).

parallel construction.

The same construction should be used for elements that are parallel or coordinate in meaning. The following sentences illustrate the clumsy or misleading combinations that result from failure to observe this rule:

The average growing season *according to the Ennis record* is 98 days [at Ennis] and longer at the other stations.

The district has a moderate climate, in winter not very cold and *not excessively hot* in summer [not excessively hot].

The veins pinch out in one direction and *in the other* pass under the glacier [in the other].

These leaves range in length from 6 to 9.5 centimeters and [in width] from 4 to 7.5 centimeters *in width.*

parallel construction.--Continued

The boundary between the belts is fairly distinct in [some] places and *in places* indefinite [in others].

The biotite replaced albite and quartz extensively and *sparingly replaced* hornblende [sparingly].

***

Correlatives (conjunctions used in pairs) should be followed by elements parallel in form. If a verb follows one, a verb should follow the other; if a prepositional phrase follows one, a prepositional phrase should follow the other. Note the following sentences:

Mr. Small *both* talked [both] longer and more rapidly than I had expected.

To the northeast, the sandstone bed *both* became [both] thicker and coarser grained.

Either the water was [either] too turbulent or too shallow for such bottom-dwelling species.

Either you will [either] report on time or be penalized for your absence.

This Nation *not only* has achieved great things [not only] in science but also in the arts.

The program *not only* aimed at development of techniques that [not only] would be useful in the present emergency but also would improve the efficiency of normal operations. Quoted from U.S. Geological Survey (1958, p. 141-142).

parameter.

One man's feelings about the use of the word "parameter," quoted by James J. Kilpatrick in his column in the Indianapolis Star, November 1, 1981, page 6F, are quoted here by permission of Mr. Kilpatrick:

> R. E. Shipley, who lives in Indianapolis, wrote me a bitter letter not long ago about "parameter." The word, he said, "has been manifestly bastardized, or worse yet, wordnapped into having meanings of consideration, factor, variable, influence, interaction, amount, measurement, quantity, quality, property, cause, effect, modification, alteration, etc."
>
> "Although meanings of words are understandbly subject to evolutionary change," Shipley said, "the capricious misappropriation of an innocent technical word and corruptly investing it with a set of imprecise and completely unrelated meanings is an indefinsibly irresponsible act."

Authors will be clear as well as correct if they restrict their use of the word "parameter" to its mathematical meaning--the numerical value of a constant used as a referent for determining another variable, or as the values used in an equation or matrix. Quoted from Finch and Aronson (1982, p. 229).

part and portion, partly and partially.

"Part" is generally preferable to "portion," and "partly" to "partially."

"Part" is a fraction or constituent of a whole; "portion" primarily means share and as contrasted with "part" denotes an entity taken from a whole. In Survey writing, use "part" unless there is clearly the idea of apportioning or sharing. "Partly" is used correctly where

part and portion, partly and partially. --Continued

the meaning is "in part," and "partially" is used correctly where the meaning is "in some degree or measure" or "to some extent." "Partially" metamorphosed is better than "partly" if it refers to degree, as it generally does. Note the proper use of the above words.

The fieldwork was done during the first part of the month.
Part of the soil was sampled.
Gold was found in the southern part of the mine.
His portion of the estate was $50,000. Quoted from U.S. Geological Survey (1958, p. 164-165).

participle.

See "verbals," p. 50.

passive verbs.

In many sentences the passive form is wordy and weak, and it may mean that the author is trying to convince himself. "It was expected to be found" is distinctly inferior to "I expected to find it" or "The writer expected to find it." "It is believed by many geologists" is no better than the briefer statement "Many geologists believe." Phrases like "It is believed to be" and "It is supposed to be" are generally used only to express the writer's belief or supposition and serve merely to multiply words. The words italicized in the following sentences can easily be spared: "It is *believed to be* probably a stream deposit"; "It *is supposed that it* may be due to a fault." The reader will readily accept "may be," "probably," "perhaps," and the like as expressing the writer's judgment. Quoted from U.S. Geological Survey (1958, p. 145-146).

percent (%).

The symbol "%" should not be substituted for "percent" except in tables where space is insufficient for the word.

percent.

After the word "in" -- in percent.
In parentheses -- (percent).
After a number -- 10 percent.
When alone at the head of a column -- Percent.
In the established terms "percent sodium" and "weight percent" (Finch and Aronson, 1982, p. 217)

percentage.

Where not preceded by a number -- a small percentage.
Where common usage dictates, for example:

percentage of particles finer than indicated size
percentage of time flow was equaled or exceeded
5 percentage points (Finch and Aronson, 1982, p.217)

performed.

See "stilted and showy writing," p. 44.

plurals and possessives.

The possessive case of a singular or plural noun ending in "s" or with an "s" sound is formed by adding an apostrophe only—Jones', Joneses', princess', princesses', Williams', Cos.' (plural), but Co.'s (singular), conscience' sake.

In compound nouns the "s" is added to the element nearest the object possessed—John White, Jr.'s (no comma) account.

Joint possession is indicated by placing an apostrophe on the last element of a series, but individual or alternative possession requires the use of an apostrophe on each element, as in the following:

plurals and possessives. --Continued

soldiers and sailors' home
men's, women's, and children's clothing
editor's or proofreader's opinion

The singular possessive case is used in such general terms as the following: fuller's earth, miner's inch.

The apostrophe is used to indicate the coined plurals of letters, figures, and symbols as follows: 1920's, Btu's, YMCA's, a's, 7's, T's, 2 by 4's. Quoted from U.S. Geological Survey (1958, p. 199-200).

plural geologic terms.

Some authors use the plural of geologic terms (for example: clays, gravels, sands, silts, and slates) indiscriminately and generally incorrectly. Here is what Rickard (1931, p. 49) said about two of these words: "***As used in geology, 'gravel' is a term covering a particular kind of deposit; it is a collective noun for the material in such a deposit. ***In geology, 'slate' is a rock characterized by a cleavage independent of the planes of sedimentation. 'Slates' should refer to several series of strata composed of such rock." Quoted by permission of Society of Mining Engineers of AIME. Technical Writing, 3d edition, by T. A. Rickard, © 1931.

pollution. See "contamination, pollution," p. 15-16.

poor. See "good, bad; well, poor," p. 24.

portion. See "part and portion, partly and partially," p. 34-35.

possessive. See "completeness," p. 14, and "plurals and possessives," p. 35-36.

preposition. See "completeness," p. 14, and the three subjects that follow.

prepositions, faulty use of.

Do not use a preposition before a noun clause used as an appositive.

Unnecessary preposition: It has the advantage over other alkalies *in that* its unused excess breaks up into water and ammonia gas. (. . . the advantage . . . that . . .)

Do not use a preposition before a restrictive appositive.

Unnecessary preposition: The name *of* artificial silk, first applied and later dropped, was incorrect. (The name "artificial silk" . . .)

Be watchful for the preposition that inadvertently slips into a sentence between a verb and its object.

Unnecessary preposition: The undermining of morals as a result of the war has been considered by some authorities *as* a greater loss than life and property. (. . . has been considered a greater loss.)
Unnecessary preposition: He was nicknamed *as* Thomas the Sudden. (He was nicknamed Thomas the Sudden.)
Unnecessary preposition: His term of office is *for* ten years. (. . . is ten years.)

Do not use two prepositions when one will convey the meaning: *for from, of between, for between, in behind, in between, to within,* are usually wrong.

prepositions, faulty use of. --Continued

Too many prepositions: Pasturage for a cow and a calf *for from* 42 to 68 days. (. . . for 42 to 68 days.)
Too many prepositions: Rights are selling *for between* $11 and $29. (. . . for $11 to $29.)

Do not use a preposition where the construction calls for a conjunction.

Faulty use of "to" after "between": The ratio *between* the width of the head *to* the length. (The ratio *between* the width *and* the length.)
Faulty use of "with" after "between": Comparisons drawn *between* the various tissues and the organs of this specimen *with* those of higher animals. (. . . between the tissues of this specimen and those . . .)

When ambiguity is created in reference to price rises, place the old price in the second position.

Ambiguous: The events increased the wholesale price from 73½ to 74 cents. [Unclear whether this is the price or the rise.]
Better: The events increased the wholesale price to 74 cents, from 73½.

Marjorie E. Skillin/Robert M. Gay, WORDS INTO TYPE, 3d ed., (c)1974, p. 382-383. Reprinted by permission of Prentice-Hall, Inc., Englewood Cliffs, N.J. See "with, without," p. 52-53.

prepositional idioms.

The current uses of a few common prepositional idioms are given below. Others may be found in dictionaries and textbooks.

Compare: one thing **with** another, similar thing; one thing **to** another, different thing.
Conform: **to** practice, **to** a design; comformable **to,** in conformity **with.**
Consist: **in** performing an act, or **in** a definition or statement of identity; **of** quartz and calcite.
Contrast (verb): one thing **with** another.
Contrast (noun): **between** things; present a contrast **to** a person or thing; one person or thing placed in contrast **with** another.
Correspond: correspond **to** things; correspond **with** (write letters **to**) persons.
Differ: pyrite differs **from** gold; he differs **with** that opinion.
Different **from** (not different **than**).
Essential: **essentials of** geology; essential **to** success; the first essential **in** preparing a specimen.
Identical: one thing **with** another (not **to** another).
In search **of;** the search **for.**
Independent **of** (not **from**).
Necessary: **for** a trip; **to** advancement.
Overlain **by** (not **with**).

Quoted from U.S. Geological Survey (1958, p. 186-187).

prepositional phrases.

See "order of related words and phrases," p. 32, and "prepositions, faulty use of," p. 36.

present, presence.

"Present" is a prime favorite with many writers, but "present" and "presence" are generally superfluous, as in the sentences below.

The undulating strata mark one of the many local unconformities *present* in the arkose.
Here cacti are *present in greater abundance* [more abundant] than on the plateau.
In most of its facies quartz is the most abundant mineral *present.*
The metallic minerals *present* in the ores * * *.
The *presence of* open channels that extend downward to caverns may be seen at several places.
The *presence of the* other sulfides of copper were not noted in the district. (Wrong subject but right verb.) Quoted from U.S. Geological Survey (1958, p. 190).

presently.

One of the "pet peeves" of many careful writers is the frequent use of *presently* when *now* is meant. *Presently* is used by most careful writers to mean *forthwith* or *soon*; do not water it down to mean *now* or *at present.*

Not: We are *presently* engaged in the preparation of a handbook for revenue officers.

But: We are *now* preparing a handbook for revenue officers.

Or: We *are preparing* a handbook for revenue officers. (This form of the verb indicates *the present time.*)

Quoted from Spurlock and Dawson (1969, p. 237-238).

Definitions of "principal" and "principle" have been included because many writers find these words confusing.

principal (adj.)

principal (noun).

[1]prin-ci-pal \'prin(t)-s(ə-)pəl, -sə-bəl\ *adj* [ME, fr. OF, fr. L *principalis*, fr. *princip-, princeps*] 1 : most important, consequential, or influential : CHIEF 2 : of, relating to, or constituting principal or a principal — **prin-ci-pal-ly** \-ē, 'prin(t)-splē\ *adv*

[2]principal *n* 1 : a person who has controlling authority or is in a leading position: as a : a chief or head man or woman b : the chief executive officer of an educational institution (as a high school) c : one who employs another to act for him subject to his general control and instruction; *specif* : the person from whom an agent's authority derives d : the chief or an actual participant in a crime e : the person primarily or ultimately liable on a legal obligation f : a leading performer : STAR 2 : a matter or thing of primary importance: as e (1) : a capital sum placed at interest, due as a debt, or used as a fund (2) : the corpus of an estate, portion, devise, or bequest b : the construction that gives shape and strength to a roof and is usu. one of several trusses; *broadly* : the most important member of a piece of framing — **prin-ci-pal-ship** \'prin(t)-s(ə-)pəl-,ship, -sə-bəl-\ *n*

principle (noun).

prin-ci-ple \'prin(t)-s(ə-)pəl, -sə-bəl\ *n* [ME, modif. of MF *principe*, fr. L *principium* beginning, fr. *princip-, princeps* one taking the first part — more at PRINCE] 1 a : a comprehensive and fundamental law, doctrine, or assumption b (1) : a rule or code of conduct (2) : habitual devotion to right principles ⟨a man of ~⟩ c : the laws or facts of nature underlying the working of an artificial device 2 : a primary source : ORIGIN 3 : an underlying faculty or endowment : an ingredient (as a chemical) that exhibits or imparts a characteristic quality ⟨such ~s of human nature as greed and curiosity⟩ 4 *cap, Christian Science* : a divine principle : GOD — **in principle** : with respect to fundamentals ⟨prepared to accept the proposition *in principle*⟩

prior to.

Use "before." See "Latin and other foreign words and phrases," p. 28-29.

proceed.

See "stilted and showy writing," p. 44.

procure.

See "stilted and showy writing," p. 44.

pronouns.

See "antecedents and pronouns," p. 7; "completeness," p. 14; and "restrictive and nonrestrictive clauses," p. 42.

pumping, pumpage.

"Pumping" is the action of a pump; "pumpage" is the quantity lifted (pumped).

punctuation.

Use commas before coordinating conjunctions "and," "or," "nor," "but," "for" in a sentence made up of coordinate clauses, unless the clauses are short and closely connected.

The population increased from 10 or 15 to about 200 within 2 or 3 weeks, and tents and frame buildings of all descriptions were hastily erected.

Certain difficulties arose between the contracting parties, and the work was abandoned.

Hops and briars are twined about the shrubs, and flowers grow in profusion.

Skies were clear and temperatures soared.

The slope was steep and the path was rocky.

punctuation.--Continued

If the coordinate clauses of a compound sentence are not joined by a connective, use a semicolon.

Recharge from streamflow is about 8,000 acre-feet per year in the entire area; recharge from precipitation is about 17,000 acre-feet.

If a conjunctive adverb is used between coordinate clauses, it is preceded by a semicolon.

The mine was idle for many years; then a new company reopened it.
Explosions had shattered the rocks; hence, structural relations were obscure.
The roads were blocked with snow; consequently, the machinery did not arrive on time.

***

Use a comma after the word preceding "and," "or," or other connective in a series of three or more words or phrases. If, however, the separate members of the series are long or contain commas, use a semicolon between the members.

The deposit consists of clay, sand, and gravel.
The upper coal is 21 inches thick, the parting 12 inches, and the lower coal 18 inches.
The order of deposition was: quartz and pyrite; massive galena, sphalerite, and pyrite; brown carbonates and quartz; and small amounts of all those named, together with fluorite, barite, calcite, and kaolin. Quoted from U.S. Geological Survey (1958, p. 197).

Some writers argue that a comma is not needed before the conjunction "and" in a sentence containing a series of three or more words or phrases. Omission of the comma before "and" in the following sentence, however, gives the governor's two daughters the unlikely names of two famous baseball players: Honored guests at the party included the governor's two daughters, Steve Carlton and Pete Rose.

purposes. See "abstract terms," p. 4.

quantity. See "amount, number, quantity," p. 7.

quantities, measurements. Age, degree, measurement, money, percentage, proportion, time, and similar matter are expressed in figures: 6 years old, 27°, 45 miles, 9 bushels, 24 pages, 16 by (or ×) 24 inches, $1.54, 17 percent, ratio of 1 to 4, 1:62,500, 10 o'clock, 10 p. m., 4:30 p. m. (but four centuries, three decades). Quoted from U.S. Geological Survey (1958, p. 196).

quite. Some writers use "quite" for "very," "somewhat," or "rather," or use it superfluously. Phrases like "quite large," "quite a distance," "quite a few" should be avoided. "Quite" should be used in its primary sense, to mean "entirely" or "completely," as in the phrases "quite conclusive" and "not quite finished." "White plastic clay quite free from sand" is a correct use in which "quite" means "wholly" or "entirely"; its omission would be preferable. Quoted from U.S. Geological Survey (1958, p. 166).

quotations. Responsibility for the accuracy of quotations rests with the author; they will not be verified in editorial review. In reprinted matter the exact words of the original should be preserved, but it is not necessary to reproduce typographical errors or details of printer's style such as

quotations. --Continued

spelling, capitalization, and punctuation, except in quotations in which, for obvious reasons, quaintness or exactness of form should be preserved. Omissions in quoted matter should be indicated by three asterisks. Errors sometimes are made in copying printed matter. The typed copy of every quotation should be compared carefully with the original.

Ordinarily quotations from foreign languages are translated into English; if it is desirable to present the material in its original language, both the original and a translation should be given.

"British English" and "American English" differ slightly in spelling, capitalization, and other features. A direct quotation from a foreign author should not be changed to conform to "American English," but with this exception most American journals and publishers, including the Survey, routinely change "British" to "American" usage. By the same token, an author who publishes in a journal outside the United States should expect to find his usage changed to conform to local customs.

Text changes in either direction may occasionally cause slight discrepancies between text and map explanations. Consistency between the two is highly desirable but, if expediency dictates that different usage be allowed to stand in the illustrations, most readers will be able to jump the hurdle from "colour" to "color" or from "dyke" to "dike."
Quoted from Bisnop, Eckel, and others (1978, p. 92).

range, vary.

In expressing approximate size, well-known objects can be used for comparison, even though these objects do not occur in exact sizes. For example, one may say loosely "The pebbles were the size of walnuts." In giving a range, however, such terms are too indefinite; the ends of the range should be expressed in some unit of measurement, such as an inch or a centimeter.

***

If only the upper limit is to be given, the form "as much as," or "reach a maximum of" can be used, as in "The granite contains phenocrysts of microcline 'as much as' 2 inches in length" and "The pebbles reach a maximum diameter of 6 inches." "Range" should not be used unless both limits are given; in the sentence "The pebbles range up to 6 inches in diameter," substitute "are as much as" for "range up to."

In a statement of range in size or price, only two limits should be given. "The price ranges from $11 to $17 and $18 a ton" should read "from $11 to $18 a ton." Such sentences as "Its thickness ranges from 35 feet or less to 175 feet or more" conveys no exact information and should be avoided. Write instead, "Generally ranges from 35 to 175 feet," which implies that locally the thickness may be greater than the maximum or less than the minimum of the range specified.

Care should be exercised in the use of zero, as zero is significant when it is used to indicate a measurement. (See p. 99–100.) A reader who is told that two coal beds are "separated by 0 to 6 inches of bone"

range, vary. --Continued

may wonder how great a separation would be made by 0 inch of bone. However, in the sentence "The coal bed ranges in thickness from 0 to 6 feet," it should be obvious that the range is from nothing to 6 feet.

"Vary" should be reserved to indicate variations or fluctuations like those meant in the sentences "The flow of the well varies," "The stream varies in width," "The tide here varies greatly in height," "The bed is of varied thicknesses." In the sentence "The wells vary from 100 to 300 feet in depth," "vary" should be replaced by "range." However, "The water level in the well varies with the season" is correct. Quoted from U.S. Geological Survey (1958, p. 166-167). See "featheredge, knife edge," p. 20.

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relation, relationship.

"Relation" is generally preferred in Water Resources Division reports.

relatively,

See "comparatively, relatively," p.13.

repetition.

A writer may repeat, without offense, certain minor words such as "a," "and," "the," and "of." If words like "data," "occurs," and "important," or especially, if a more unusual word is repeated in a single sentence or paragraph, the repetition at once diverts the reader's attention from the subject matter.

Avoid using the same word to convey different meanings in a sentence. One author wrote, "These do not resemble the diatomaceous remains found in the chalky shale, and their character remains indeterminate." Quoted from U.S. Geological Survey (1958, p. 185).

respective, respectively.

These words are used unnecessarily more often than not (Gowers, 1962, p. 91-92). "Respectively" can be deleted from the following sentence without

respective, respectively. --Continued

changing the meaning: The concentrations of iron in water in well 29b were 0.20, 0.23, and 0.27 milligrams per liter in July, August, and September, respectively. By convention, the concentrations are in the same order as the months.

restrictive and nonrestrictive clauses.

Critics differ regarding the use of the relative pronouns "which" and "that" to introduce the restrictive clause. However, the author will always be clear as well as correct if he uses "that" to introduce the restrictive clause and "which" to introduce the nonrestrictive clause.

A test of whether the clause is restrictive or nonrestrictive is to omit it. If its omission changes the meaning or results in a statement that does not make sense or is incomplete, it is restrictive. If it can be omitted without changing the meaning, it is nonrestrictive.

The restrictive clause should not be set off by commas, even if it is decided, for reasons of euphony, clearness, or emphasis, that a "which" is better than a "that" to introduce it. A nonrestrictive clause generally is set off by commas, but there are sentences in which, because of context or because of other punctuation, the nonrestrictive clause is not set off by commas.

In referring to a person, either "who" or "that" may be used. "Whose" may be used to designate things as well as persons, as in "The only State whose production exceeded * * *."

A phrase such as "and which," "and who," or "and whose" requires a preceding relative pronoun to justify the "and": "This district, [which is] the largest and which contains the principal mine, is in the western part of the county." The statement applies also when the conjunction "but" is used.

Where a restrictive clause is followed by an "and which" clause, both clauses take "which": "The district *that* [which] is the largest, and which contains the principal mine * * *."

The statements that have been made regarding punctuation of restrictive and nonrestrictive clauses apply also to phrases and appositives. Examples of restrictive and nonrestrictive modifiers are given below.

Clause

Measurements that are inaccurate are worthless. (Restrictive.)

The measurements, which were made by Jones, are inaccurate. (Nonrestrictive.)

They will start mining when the weather improves. (Restrictive.)

They will start mining in the spring, when conditions will be better. (Nonrestrictive.)

Participial phrase

The peak shown at the right-hand edge of the map is Mount Taylor. (Restrictive.)

The peak, rising high above the valley, is a famous landmark. (Nonrestrictive.)

Appositive

They were seeking the lead minerals galena and anglesite. (Restrictive. If the words "galena and anglesite" are omitted, the sentence means that they were seeking all the lead minerals, but they were seeking only galena and anglesite.)

They were seeking the lead sulfide, galena. (Nonrestrictive.) Quoted from U.S. Geological Survey (1958, p. 149-150).

runoff.

See "flow, discharge, streamflow, and runoff," p. 21.

secure (verb). See "stilted and showy writing," p. 45.

seems. See "appears, seems," p. 8.

sentence. Each sentence should be complete, both in thought and in construction. The reader should not have to guess at the author's meaning or have his thought distracted by the omission of words.

***

The long sentence is not objectionable if it is well knit together and reads smoothly. The long, rambling sentence consisting of a series of clauses connected by "and" or "and so" or containing long parenthetic clauses interrupts the continuity of thought. Correct it by breaking it into shorter sentences or by making some of the clauses subordinate. A choppy sequence of short sentences is also undesirable, for it is hard to read. Generally such sentences can be combined in a way that will make the relation of their thoughts clear. ***Quoted from U.S. Geological Survey (1958, p. 136-137).

sentence, structure of. See "order of related words and phrases," p. 32, and "parallel construction," p. 33-34.

short words, long words. A long word is not objectionable simply because of its length. The word should be chosen that best expresses the meaning, but if a short word is available it is generally to be preferred. An author should consider, for example, whether "numerous" cannot be replaced by "many"; "approximately" by "about"; and "during" by "in." (See also "Many, numerous," p. 163, and "Around, about, approximate," p. 174.) Moreover, the repetition of a short word does not divert the reader's attention so much as that of a long word. Quoted from U.S. Geological Survey (1958, p. 186).

Abraham Lincoln's Second Innaugural Address and his Gettysburg Address are examples of the effectiveness of short words. About 80 percent of the words in his Second Innaugural Address consist of one or two syllables.

simply. See "very, merely, simply," p. 51.

situated, located. "Situated" and "located" are generally superfluous when used as in the following sentences:

One of the domes is *located* in sec. 31; the other is *located* in secs. 3 and 4.
South of the axis of the principal anticline in sec. 13, there is *situated* a small syncline.
The outcrops are *situated* on the shore *and in* close *proximity* to deep water.
The largest of these outliers is *situated* 2 miles *to the* southeast*ward* of the canyon.
This field is *located* 3 miles north of Bristol. Quoted from U.S. Geological Survey (1958, p. 190).

smaller. See "fewer, less, lesser, smaller," p. 21.

sometimes. See "time and place," p. 48.

spelling.

The Survey in general follows, first, the GPO style manual and, second, WNI 3 for spelling and also for word compounding, capitalization, and punctuation. The GPO manual follows WNI 3 quite closely for spelling, not so closely for word compounding.

Some abbreviations, signs, and symbols commonly used in Survey reports are given on pages 99–108. Quoted from Bishop, Eckel, and others (1978, p. 231).

split infinitives.

Examples of split infinitives include to actually realize, to better know, and to really comprehend. Writers of these and other split infinitives are described as careless by Tichy (1966, p. 105). See "verbals," p. 49.

statistical terms.

In surface-water reports only two kinds of averages are commonly used for streamflow—the arithmetic mean and the median. Unless specified otherwise, the term "mean" signifies the arithmetic mean obtained by adding all items together and dividing the total by the number of items. When "weighted mean" or "geometric mean" is used, it should be so designated. "Mean" and "median" are sometimes confused, although the two terms differ basically. The median is defined as the middle item when the items are arranged according to rank. The median is an average of position, whereas the mean is an average of quantity. The relative position of the mean and median of an array of data depends upon the skew of the data—that is, upon the deviation from the hypothetical normal distribution. In an array of streamflow data the median is almost always lower than the mean. The median is used advantageously to represent the normal discharge of a stream, for evaluating currently observed discharges, because it represents a discharge that is just as likely to be exceeded as not. Quoted from U.S. Geological Survey (1958, p. 43-44). See "average discharge," p. 9, and "daily mean, mean daily," p. 17.

stilted and showy writing.

Stilted and showy writing tends to antagonize the reader. Moreover, it is not so easily understood as plain writing, it distracts attention from the thought, and it may give the reader who seeks useful information the impression that the report does not contain much. Some scientists and engineers are distinguished by the clear, simple language of their reports. They do not refrain from using sharply defined technical words where clear-cut distinctions are necessary; but they do not, for example, write "phanerocrystalline" if "coarse grained" will express the meaning adequately, or "arenaceous" if "sandy" gives all the information needed.

Some members of the Geological Survey, if their manuscript reports can be trusted, never go anywhere—they invariably "proceed": "From this point the writer proceeded to Oshkosh"; "The party then proceeded westward." Neither do they "begin" work, they "inaugurate" or "initiate" it; and the work is not "done," it is "conducted" or "performed." Nor do they "get" or "obtain" information, they "secure" or "procure" it. If the area in which they are working is not large, they would call it not "small" but "limited" or "restricted."

***

stilted and showy writing. --Continued

"Inaugurate" and "inauguration" can be used for appropriate occasions; "initiate" is a good word to apply to ceremonies in secret societies, or, judiciously, to some other things; and "secure," associated in thought with security, should be used in the sense of "make fast" rather than of "get," "obtain," or "procure."

Authors would do well to avoid use of "limited" and "restricted" for "small," "scant," and "slight." A better use of "limited" is found in such sentences as "Sandbags piled along the railway limited the floodwaters to the eastern part of the town." Quoted from U.S. Geological Survey (1958, p. 150-151). See "vogue words," p. 51.

streamflow.

See "flow, discharge, streamflow, and runoff," p. 21.

strung-on modifiers.

The excessive use of multiple adjectives as unit modifiers should be avoided. The examples given below illustrate this fault.***

The alcoholic copper acetate ammonia-solution method.
The west-border-of-Bear-Valley report.
Large 4- to 14-foot-wide bodies of milling ore.
The 425-foot-well water.
A 300,000-kilowatt 70-percent annual-capacity factor basis.

Quoted from U.S. Geological Survey (1958, p. 190).

subsequent to.

Correct in legal documents, but stilted and verbose in routine correspondence. Substitute the word *after*, which has a simple dignity of its own.

Not: *Subsequent to* our conference with you, we learned that you had additional information . . .

But: *After* (or *following*) our conference with you, we learned that you had additional information . . (See "following," p. 22.)

Quoted from Spurlock and Dawson (1969, p. 243).

suffering rocks and other fallacies.

As the author of STA 4 wrote, "What Ruskin calls the 'pathetic fallacy' * * * seems a little far-fetched in a scientific paper," (Wood, 1935, p. 66). It's best to avoid giving animate capabilities to inanimate objects or conditions.

The rocks have suffered deformation.
Similar forms in humid climates suffer basal steepening and may therefore enjoy accelerated back-weathering.
The environment has suffered to a significant extent.
Calcareous algae are a minor element and grow as unhappy small nodular masses here and there.
A weasel was used to scout and lay out the trail.
The published impact statement is divided into seven sections that discuss the subjects listed below.
Barite and intensely silicified rock accompany the ore almost everywhere.
A layer of coarsely crystalline limestone carries bunches of garnet-pyrite rock from place to place.
Remnants of glacial debris stood on the beaches and clung to the cliffs.
The materials underwent fluctuations in pore-water pressure.
The frozen ground argued against lurching and landsliding.

Quoted from Bishop, Eckel, and others (1978, p. 257).

superfluous words.

Some writers use too many words. Needless repetition and the use of words that are structurally unnecessary detract from clearness and emphasis. Many long, involved sentences, like the following, can be reduced in length to form simple, unambiguous statements which are easily and clearly understood:

superfluous words. --Continued

Owing, therefore, to this probably limited thickness and the very fine grained texture of the rocks, these strata would yield very little ground water. (Write, "These thin beds of fine-grained rocks would yield very little ground water.")

Since that time there have been numerous taxonomic changes in the generic assignment of several of the species, and there are now 53 species which are considered valid members of the genus as interpreted by the writer (37 words). (Write, "Since then, taxonomic changes have raised to 53 the number of species that the present writer considers valid members of the genus"—22 words.)

Furthermore, *the obscuring effect of* the terrace and loess deposits *prevents detection of* [obscure] the structure in the underlying Eocene.

Superfluous and improper words italicized in the following examples should be omitted:

Throughout *the whole of* the Mesozoic era.
Throughout the *entire* area.
A series of parallel ridges resembling in *their* form * * *.
They are *both* alike.
There can be no doubt *but* that it is Cretaceous.
The Survey has not *as* yet done any work in this region.
The conditions were favorable for landslides *to occur*.
Equally *as* well.
Most of the intrusive masses are *of* large *size*.
The rock is dark green *in color*.
An innumerable *number of* tiny veins.
Bilateral asymmetry.
Contemporaneous *in age*.
A report giving the results of the work is in *progress of* preparation.

Introductory phrases like those below, perhaps intended to "break it gently" to the reader, can often be omitted or else be replaced by fewer words.

As already stated * * *.
It may be said that * * *.
It might be stated that * * *.
Concerning this matter it may be borne in mind that * * *.
In this connection the statement may be made that * * *.
With respect to the occurrence of these ores it has been found that * * *.
It is possible that the ore *is* [may be] primary.
There can be little doubt that this fissure is [almost certainly] the prolongation of a fault *of the same character as the one* [like the one] already described. Quoted from U.S. Geological Survey (1958, p. 188-189).

See "situated, located," p. 43.

temperature (cold or hot).

"Cold temperature" is used erroneously by some authors instead of "low temperature" or "cold weather." Similarly, "hot temperature" should be avoided. Quoted from U.S. Geological Survey (1958, p. 169).

temperature (degrees)

°C (degree Celsius) and °F (degree Fahrenheit); but 32° F or 0° C (Bishop, Eckel, and others, 1978, p. 101; U.S. Government Printing Office, 1973, p. 166 and 169).

tenses of verbs.

1. Experimental Facts. The experimental facts should be given in the *past tense*. (For example: The plants *grew* better in A than in B. The dry weight *was* greater in A than in B.)

2. Presentation. The remarks about the presentation of data should be mainly in the *present tense*. (For example: Diagrams of dry yields *are* shown in figure 3. The second column of table 2 *represents* the dry weight of tops.)

tenses of verbs. --Continued

3. Discussions of Results. Discussions of results may be in both the *present* and *past tenses,* swinging back and forth from the experimental facts to the presentation. (For example: The highest dry weight *is* shown for culture A, which *received* the greatest amount of the ammonium salt. This may mean that the amount of nitrogen added *was* the determining condition for these experiments.)

4. Specific Conclusions. Specific conclusions and deductions should be stated in the *past tense,* because this always emphasizes the special conditions of the particular experiments and avoids confusing special conclusions with general ones. (For example: Rice *grew* better, under the other conditions of these tests, when ammonium sulfate *was* added to the soil. Do not say: Rice *grows* better when ammonium sulfate *is* added to the soil.)

5. General Truths. When a general truth is mentioned, it should, of course, be stated in the *present tense.* Logically, a general truth is without time distinction. For example, one may say, "Many years ago, scientists were convinced that malaria *is* caused by a germ carried by a certain species of mosquito." Well-established principles of mathematics, physics, and chemistry should be put in the *present tense* (Trelease, 1958, p. 67-68). Quoted by permission of THE WILLIAMS & WILKINS COMPANY, Baltimore, Md.

Two further suggestions as to choice of tense are offered:

1. Present and past tenses should not be used interchangeably with bibliographic references, as: "Smith (1960, p. 44) reports * * *; he stated * * *." Either present or past tense is permissible, but consistency should be maintained. An easily followed plan is to use past tense for the individual, whether living or dead, and present tense for the book, map, chart, or other inanimate reference that will exist indefinitely, as: "Brown (1965, p. 261) stated, believed, implied, indicated * * *; his figure 6 shows * * *."
2. If an action or state of being was completed in the past, that fact should be made clear. If the simple past tense is applicable, use of the present perfect is confusing:

> Four units have been inferred. (The writer meant that in his field study he inferred four units, but the reader does not know whether the present writer or some previous writer inferred four units. Write "Four units were inferred.")
>
> The specific yield has been determined by two analytic methods. (By the writer or by some other researcher?)

Quoted from Bishop, Eckel, and others (1978, p. 211-212).

that, which. See "restrictive and nonrestrictive clauses," p. 42.

there is, there are. See "impersonal construction," p. 26.

third person. See "first or third person," p. 21.

this, these. See "antecedents and pronouns," p. 8.

this year. See "last year, this year," p. 28.

till. See "glacial till," p. 24.

time and place. The meticulous writer will reserve adverbial words and phrases such as "at times," "often," "sometimes," "when," and "while" for expressions of time. Adequate expressions for denoting place are usually available.

These phenocrysts are often deeply corroded.	Many of these phenocrysts are deeply corroded.
The complexity of the folding is sometimes very marked.	The complexity of the folding is very marked at some places.
These terraces are frequently covered with gravel.	Many of these terraces are covered with gravel.
These pebbles almost never have striated faces.	Few of these pebbles have striated faces.
These pebbles are usually light gray, although some are light yellow.	Most of these pebbles are light gray, although some are light yellow.
The ore was richest when it was most altered.	The ore was richest where it was most altered.

Quoted from Bishop, Eckel, and others (1978, p. 243-244).

"When" is often misused for "where," as in the following sentences:

When **[Where] the thickness is greatest it is 250 feet.**
The ore was richest *when* [where] it was most altered.
The limestones range in color from light gray *when* [where] fresh to pale yellow where exposed to the weather. Quoted from U.S. Geological Survey (1958, p. 169).

title of report. The title should be as brief as it can be made, consistent with clarity; it should not serve as a summary of the report.***

Most Survey authors avoid beginning their titles with such words as "The," "A," "Notes on," and "On." ***
Quoted from Bishop, Eckel, and others (1978, p. 37).

As a minimum, titles should convey what was studied, where it was studied, and when it was studied. Quoted from U.S. Geological Survey (1981).

two or three. Phrases such as "two or three," "eight or ten," and "two or three hundred" occur routinely in conversation and in informal writing, but the scientific writer may want to consider whether he means "two to three," "eight to ten," or "two to three hundred." Quoted from Bishop, Eckel, and others (1978, p. 252).

under. See "over, under," p.

unique. "Unique" is generally considered to be not comparable, either positively or negatively. Rather than "more unique," try "more rare"; rather than "less unique," try "more abundant," or some appropriate variation. Some language authorities frown on comparing "fatal," "round," "permanent," "stable," and other terms of specific and limited meaning. Quoted from Bishop, Eckel, and others (1978, p. 252).

unit modifier. See "compounding," p. 14-15.

units of measure. See "numerals," p. 30-31, and "quantities, measurements," p. 39.

using (participle and adjective). The participle using is commonly misused by some writers. An example of the misuse follows: Using a new type of drill, the test hole was completed by the hydrologist. The participial phrase (underlined) dangles. The problem can be solved by rewriting the sentence as follows: Using a new type of drill, the hydrologist completed the test hole. The adjective phrase is now next to the noun that it modifies. See "verbals (gerunds, infinitives, participles)," p. 49-50.

utilization. An inflated word for "use" (Department of the Army, 1959, p. 27).

vary. See "range, vary," p. 41.

veneer. Some writers use "thin" as a modifier of "veneer." This use of "thin" is redundant.

ve·neer \və-'ni(ə)r\ *n* [G *furnier*, fr. *furnieren* to veneer, fr. F *fournir* to furnish — more at FURNISH] **1** : a thin sheet of a material: as **a** : a layer of wood of superior value or excellent grain to be glued to an inferior wood **b** : any of the thin layers bonded together to form plywood **2** : a protective or ornamental facing (as of brick or stone) **3** : a superficial or deceptively attractive appearance or display ; GLOSS

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verb or part of verb. See "completeness," p. 14.

verbal, oral. "Verbal," which refers to words, is used improperly for "oral," which means "spoken." "Written" or "oral" communications should be used in referring to unpublished information (U.S. Geological Survey, 1958, p. 171).

verbals (gerunds, infinitives, participles). Gerunds, infinitives, and participles (usually called "verbals") are verb forms that function as other parts of speech. They give the language much of its richness, flexibility, and variety.

Gerunds, the "-ing" verb forms that are used as nouns, are rather difficult to misuse, though the writer may have to decide what he wants to emphasize: He may write "I heard his singing," to emphasize what he heard, or he may write "I heard him singing," to emphasize whom he heard. The first "singing" is a gerund, object of "heard"; the second "singing" is a participle describing the pronoun "him."

Mr. Jones' singing could be heard all over the neighborhood. (gerund)
Mr. Jones, singing in his shower, could be heard all over the neighborhood. (participle)

Usage of infinitives (the "to" forms of verbs, though in some expressions the "to" may be omitted) is a little more complicated than usage of gerunds. There's the question of "to split or not to split." Perhaps we may agree that the best writers split only when necessary to make their meanings clear, and that isn't very often. ***

verbals.
--Continued

***

But do bear in mind that if an infinitive is split, the splitting adverb inexorably modifies its infinitive. The author who wrote that "The program was designed and written to specifically accommodate interactive access to data banks" must have meant "The program was specifically designed and written to accommodate * * *." (Or did he mean "The program was designed and written to accommodate interactive access to specific data banks"?)

A more difficult matter than the split infinitive is the dangling infinitive phrase. An initial infinitive phrase dangles if it does not refer to the subject of the main clause of the sentence (IRS 1, p. 110).

To evaluate the potential effects of future earthquakes, actual effects of past earthquakes must be studied.

To evaluate the potential effects of future earthquakes, we must study actual effects of past earthquakes.

Participles (verb forms that may be used as adjectives) are very useful parts of speech, but their correct usage can be tricky. In the statistics of crimes against grammar, misuse of participles must be near the peak of the curve. This misuse is so widespread and contagious it might be called "participilitis". ***

In general, the past participle is seldom misused except by the uneducated in variations of such as "He done it," though even a postdoctoral fellow may have to consult a dictionary for the correct choice of "proved" or "proven" and may find that lexicographers themselves can give no firm dictum.

It is the present, "-ing" participle that is so easily misused when functioning as part of an adjective phrase. Such misuse occurs when the participle "dangles," that is, when its function is descriptive but the sentence contains no noun or pronoun that it can logically describe: "Where the till is thick it is light in color, indicating a lesser degree of oxidation."

The meaning of the sentence perhaps is fairly clear, but little ingenuity is needed to recast it into correct grammatical form: "The light color of the thicker till indicates a lesser degree of oxidation" or "Less oxidation of the thick till is indicated by the lighter color" or "Where the till is thick, its lighter color indicates a lesser degree of oxidation" or some other variation. To add "thus" to a dangling participial phrase corrects nothing. "* * * thus indicating less perfect oxidation" would still dangle. "As a matter of fact, we can be pretty sure that any 'thus * * * -ing' combination in a sentence forms a dangling participle" (IRS 2, p. 54).

The present participial phrase should clearly modify the subject of the sentence or of the independent clause, or it should be close to the noun or pronoun it does modify. Correction of the dangling participle may require substitution of some other part(s) of speech.

The flood left its mark along a course of more than 550 miles, extending from western Montana to the Pacific Ocean.

The flood left its mark along a course extending more than 550 miles, from western Montana to the Pacific Ocean. *Or*: * * * extending from western Montana to the Pacific Ocean, more than 550 miles. *Or* (better): The flood extended for more than 550 miles, from western Montana to the Pacific Ocean.

Verbals quoted from Bishop, Eckel, and others (1978, p. 214-216).

versus.

Commonly used on billboards listing opposing teams of baseball, football, and other games but not used in titles of illustrations; for example, "Relation of ground-water movement and head," instead of "Ground-water movement versus head."

very, merely, simply.

"When you write 'very' in a news story, scratch it out and substitute the word 'damn.' Then scratch out the 'damn,' " William Allen White advised a young reporter. Young geology authors, and older ones too, take note. "Very" can be made informative in spoken English by voice manipulation, but it usually adds little to a written statement. Repetitious use of the written "very" (or any other general term) gives a paper an amateurish tone.

"Damn" is not a satisfactory substitute for either "merely" or "simply," but the two words are about as empty of written meaning as "very." Quoted from Bishop, Eckel, and others (1978, p. 252-253).

vicinity of, neighborhood of.

"In the vicinity of" and "in the neighborhood of" are used unnecessarily for "about" or "nearly," as in the following sentences:

The cost of production is in the vicinity of 50 percent of the selling price.
Its population is in the neighborhood of 1,500. Quoted from U.S. Geological Survey (1958, p. 171).

vogue words.

Some writers believe that "vogue words" (words that have suddenly or temporarily become popular) clarify their message. Tichy (1966, p. 207-208) calls these words "fancy" and indicates that they can be inaccurate and unnecessary. Some of the vogue words that clutter technical writing are "enrich," "impact," "implement," and "parameter," and the "ize" words "conceptualize," "maximize," "optimize," "potentialize," and "prioritize." See "stilted and showy writing," p. 44, and "nouns as verbs," p. 30.

Fowler (1965, p. 460) gives two warnings to users of "vogue words": "first, that popular use more often than not misrepresents, and sometimes very badly, the original meaning; and secondly, that free indulgence in this sort of term results in a tawdry style."

watershed, divide.

"Watershed" primarily means the divide separating one drainage basin from another and in the past was generally used with that meaning. However, over the years use of the term to signify drainage basin or catchment area has come to predominate. Therefore, use of "watershed" for the area drained is permitted, although "drainage basin" is preferred; "drainage divide" or just "divide" is used for the boundary between one drainage area and another. Quoted from U.S. Geological Survey (1958, p. 171).

well. See "good, bad; well, poor," p. 24.

where and when. See "time and place," p. 48.

which. See "restrictive and nonrestrictive clauses," p. 42.

while. Many writers use "while" as a conjunction instead of "though," "although," "whereas," "but," or "and," as well as in its primary sense as an adverb of time.

Some writers learned in their schooldays that "though" and "yet" are proper correlative conjunctions, but in their writings they correlate "while" and "yet": "While this is the usual arrangement, yet * * *"; "While coal and oil command high prices, yet * * *." The "while" in the last sentence is also misleading, for at first it seems to be an adverb of time. Quoted from U.S. Geological Survey (1958, p. 171).

whose. See "restrictive and nonrestrictive clauses," p. 42.

with, and, but. "With" is much misused, especially for "and" as in the sentences quoted below:

The vein has a northeast strike *with* [and] a vertical dip.

The rocks have been indurated[,] *and* tilted, *with some slight folding* [and slightly folded].

The ores in the limestone consist of crystalline aggregates of magnetite *with* [and] small amounts of other *associated components* [minerals].

At San Marcial the average rainfall is 4.84 inches *with a* [and the] minimum *of* [is] 1.17 inches.

"With" is used in the sense of "but" and a verb in the following sentences:

The rocks are mostly gray slate *with* [but include] some graywacke.

The water is very clear *with* [but has] a faint bluish tinge.

The surface of the bedrock is fairly even *with* [but contains] depressions representing temporary channels of the shifting creek.

"With" is sometimes used in place of a verb, as in the sentence "The rock is even grained, finely laminated, and well bedded and *with* [exhibits] clearly defined horizontal jointing."

"With" is superfluous in "The term 'mica' denotes a group of minerals having similar physical properties and *with* related chemical composition." Quoted from U.S. Geological Survey (1958, p. 172).

with regard to. "With regard to," "regarding," and "in connection with" are acceptable as idiomatic phrases, but other words or phrases may be less awkward: "concerning," "as for," "in respect to," "with reference to," and others. "With regards to," "as regards," "re," and "in re" are better avoided. Quoted from Bishop, Eckel, and others (1978, p. 254).

with, without. Ever since George McLane Wood wrote STA 1 in 1909, Survey authors have been admonished not to "misuse" the preposition "with." In STA 1 (p. 42) the caution was stated in four lines. In STA 5 (p. 172), 33 lines were needed to delineate possible misuses. From WNI 2 to WNI 3 the definitions of "with" increased from 11½ to 12½ columnar inches. The struggle against "misuse," or overuse, of "with" seems to be a losing one, but we will repeat Mr. Wood's comments and add a few examples of undesirable usage from STA 5 and other sources.

with, without. --Continued

"With" is much misused, especially for "and." An example of misuse is seen in the sentence "At San Marcial the average rainfall is 4.84 inches, *with a* (and the) minimum *of* (is) 1.17 inches."

The mechanic advised the woman with the broken cylinder head to report it to the company's regional office.	The mechanic advised the woman to report the broken cylinder head to the company's regional office.
The water is very clear with a faint bluish tinge.	The water is very clear but has a faint bluish tinge.
The surface of the bedrock is fairly even with depressions representing temporary channels of the shifting creek.	The surface of the bedrock is fairly even but contains depressions representing temporary channels of the shifting creek.
A fine-grained rock with blotches of a bright pink color • • •.	A fine-grained rock blotched with bright pink • • •.
The conglomerate pebbles are well rounded with a very loose cement.	The conglomerate pebbles are well rounded and loosely cemented.

***

Authors should be aware that "without" may be as undesirable as "with." Quoted from Bishop, Eckel, and others (1978, p. 253-254). See "prepositions, faulty use of," p. 36-37.

wordiness.

See "abstract terms," p. 3; "stilted and showy writing," p. 44; "strung-on modifiers," p. 45; and "superfluous words," p. 45-46.

writing style.

***"Good writing has an aliveness that keeps the reader reading from one paragraph to the next, and it's not a question of gimmicks to 'personalize' the author. It's a question of using the English language in a way that will achieve the greatest strength and the least clutter.

"Can such principles be taught? Maybe not. But most of them can be learned (Zinsser, 1980, p. 5-6)." Copyright 1980 by William K. Zinsser. From ON WRITING WELL, published by Harper & Row.

"Still plain talk will not be easily achieved in corporate America. Too much vanity is on the line. Executives at every level are prisoners of the notion that a simple style reflects a simple mind. Actually a simple style is the result of hard work and hard thinking; a muddy style reflects a muddy thinker or a person too lazy to organize his thoughts (Zinsser, 1980, p. 132)." Copyright 1980 by William K. Zinsser. From ON WRITING WELL, published by Harper & Row.

"Vigorous writing is concise. A sentence should contain no unnecessary words, a paragraph no unnecessary sentences, for the same reason that a drawing should have no unnecessary lines and a machine no unnecessary parts. This requires not that the writer make all his sentences short, or that he avoid all detail and treat his subjects only in outline, but that every word tell" (Strunk and White, 1979, p. xiv). By permission. THE ELEMENTS OF STYLE, Third Edition, by William Strunk, Jr., and E. B. White. Copyright 1979 by Macmillan Publishing Company.

written communication.

See "oral or written communication," p. 32.

wrong subject.

Writers who use up their verbs in their subjects can sometimes find no other suitable verbs and must resort to weak, clumsy, or inappropriate substitutes, such as "occurred," "accomplished," or "transpired." A writer should consider whether an abstract or a concrete term will form the best subject of the sentence he is writing, and also which one will permit the choice of a suitable verb. The following sentences, as modified, illustrate the advantage of using concrete instead of abstract terms:

The *drainage of the* area is *accomplished* [drained] by three streams.

The principal production [Most of the ore produced] was mined from the Nevada property.

The *exploration of the* region was *carried out* [explored] by Smith.

During this epoch *aggradation of* the lowlands may have *transpired* [been aggraded].

Thus *a sudden inundation of* the desert would be *accomplished* [suddenly inundated].

The *movement of the* ore solutions here must have *been* [moved] very slow[ly] or [have remained] practically stagnant.

The *formation of the* ore deposits *occurred* [were formed] just after the igneous intrusions.

Confirmation of these reports cannot be *obtained* [confirmed].

The selection, equipment, and maintenance of stream-gaging stations are *performed* [selected, equipped, and maintained] according to long-standing methods.

Barite and [intensely silicified rock] *intense silicification usually always* accompany the ore [almost everywhere]. (In this sentence the compound subject links together a mineral and a process. Actually, the products of that process accompany the ore. Change "intense silicification" to "intensely silicified rock." Also, to avoid possible misunderstanding of "always," which is a term of time rather than of place, write "accompany the ore almost everywhere.") Quoted from U.S. Geological Survey (1958, p. 146-147). See "abstract terms," p. 3-4.

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[See words within parentheses for discussion of subjects preceding them.]