

**Comments From the *Geological Society of America Bulletin* Editors**  
by Art Sylvester and John Costa

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An increasing number of GSA members lament the general deterioration in the quality and clarity of writing by earth scientists. They complain especially about the misuse and overuse of words and phrases that lead to vague, awkward, or cumbersome sentences, and that require several readings before a meaning is derived. It may be only coincidental that the derived meaning is the one intended by the author.

Insofar as it is one of the duties or prerogatives of editors to educate potential or eventual authors, when necessary or appropriate, we offer this commentary as some of our “suggestions to authors.” Our suggestions should not be regarded as “GSA style”; however, authors may find some red or purple ink in manuscripts that cross our desks if those authors misuse or overuse the words and phrases discussed below.

- We may say “volcanics,” “clastics,” “metamorphics,” “metasediments,” “intrusives,” and “granitics” to each other in the field, but it is quite improper grammatically to add an “s” to an adjective to make a plural noun. It may be tedious and repetitious to read, but it is correct and unambiguous to write “volcanic rocks,” “clastic rocks,” “metasedimentary rocks,” “intrusive rocks,” and “granitic rocks.”
- The terms “lithologies” and “mineralogies” should never be used until and unless we accept “geologies,” “biologies,” and “zoologies.” Replace them with “rocks” or “rock types,” and “minerals.” “The lithology of a study area” and “the mineralogy of a suite of rocks” are quite correct phraseology.
- Many writers of geologic literature use “compression” indiscriminately for both stress and strain, as in the context of “compressional structures.” Geologic structures are manifestations of strain; thus, in rock mechanics the convention is that “tension” and “compression” are terms that should be used in discussions of *stress*; whereas the corresponding *strain* terms are “extension” or “elongation,” and “contraction” or “shortening” or even “constriction.”
- It has come to seem that a paper is not “scientific” unless it contains two words: “essentially” and “constrain,” preferably together in the construction “essentially constrains.” Both are perfectly good, although overused, words, and they have their place in good writing. The English language is rich in other words, however, that may be used effectively to convey more explicit meaning, including “generally,” “commonly,” “typically,” “nearly,” “almost,” “mainly,” “chiefly,” “partly,” “characteristically,” “usually,” and “largely.” Writers may find that “control,” “limit,” “restrict,” “bound,”

“define,” “contain,” “characterize,” and “restrain,” and their related nouns are more meaningful than “constrain” and its related noun “constraint.”

- The sentence “evidence suggests that the Earth is flat” carries no information. *What kind of evidence? Geologic? Geodetic? Compelling? Permissive? Pseudo-scientific? Circumstantial? Specious?* Just as vague for the same reason is the statement “data suggest that the Earth is flat.” Imaginary data?
- At the same time, “data,” “strata,” “phenomena,” and “spectra” *are plural*.
- We prefer to avoid using “evidence” as a verb, as for example, in the sentence “the presence of snakes in the grass was evidenced by their rattling sounds.” We also maintain that the verb “postulate” is more euphonious than “hypothesize.”
- Strictly speaking, the whole “comprises” its parts, but our dictionaries (*Webster’s II New Riverside Dictionary, The American Heritage Dictionary*) say that the jury is almost evenly divided on its formal use, and that “comprise” may be used as a synonym for “consists of,” “is composed of,” “encompasses,” and so on, but “comprised of” is wrong.
- Our dictionaries also say that “occur” and “occurrence” are better used when “happen” and “happening,” respectively, can be substituted. Rather than “the rocks occur in the cliff,” it is better to say “the rocks are in the cliff,” “the rocks are present in the cliff,” or “the rocks are exposed in the cliff.” We expect that paleontologists will complain, however, because the “occurrence of fossils” is deeply rooted in the literature.
- The word “portion” is preferred when the word “share” can be substituted for it. Otherwise use “part,” which is no less a profound or erudite word.
- “Suggest” is a frequently overused “weasel word” in manuscripts. Many writers build a house of cards with “suggest,” when stronger words such as “indicate,” “imply,” “show,” and “prove” may be more appropriate. Authors commonly write “Joe Schmoh *suggested* that the Earth is flat,” when in fact Schmoh may have “proposed,” “concluded,” “indicated,” “maintained,” “asserted,” “inferred,” “implied,” “stated,” “believed,” “postulated,” “thought,” “guessed,” or “considered” that the Earth is flat. Other “weasel words” and phrases include “probably,” “appears to be,” “seems to be,” “may be,” and “could be.” Their overuse should be avoided as much as possible.
- “Show” is being overused, however. “The outcrop shows iron stains” is better expressed, in our opinion, by “the outcrop *is* iron stained” or “the outcrop *has* iron stains.”
- The awkward use of the infinitive “to be” is surfacing in scientific writing with increasing frequency, such as in “Joe Schmoh thought the Earth to be flat,” or “Joe Schmoh showed the rock to be lithified.” It is more straightforward to write “Joe Schmoh thought that the Earth was flat” and “showed that the rocks are lithified.” Here is another

example of vagueness: “Statistics reveal April’s GNP to be lower than March’s.” Does that sentence mean that the April GNP *is* lower than March’s or that it *will be* lower?

- “Since” is a *time* word; so also are “occasional,” “while,” and “frequently.” “Occasional outcrops of obsidian were observed since the bulldozer passed through the hill.” Were the outcrops there only on Tuesdays *because* the bulldozer passed through, or only on Tuesdays *after* the bulldozer passed through? Use “whereas” in place of “while” in those cases where time is not implied.
- We have yet to read an article that stated the *velocity* of a “rapid facies change.” We have observed and mapped *abrupt* facies changes, however.
- “Sediments” are rock-disintegration products, such as sand, silt, and gravel. We would like to be invited to go on a field trip to see “Ordovician sediments.” Although we realize that sediments were deposited in basins of Ordovician age, we’ll bet 30¢ that they are “sedimentary rocks” today and should be so called.
- Because *lines* “trend” and “plunge,” and *surfaces* “strike” and “dip,” it is incorrect to say “northwest-trending faults,” whereas “northwest-striking faults” is correct. Authors may object that the traces of faults on maps are lines, but because a map almost always represents the horizontal plane, the intersection of a fault surface with the map surface is a unique line: the strike.
- It is also increasingly common to see authors put together a string of nouns to construct what they believe is a more educated or profound name for a very simple thing, such as a “single component rock sample acquisition system” (five nouns to mean *rock hammer*).
- We believe that it is preferable to write “margin of the plateau,” instead of “the plateau’s margin,” because inanimate objects cannot possess.
- Can anyone tell us what “packages” or “packets” are in the geologic context, and where either is formally defined? We can cite several different sizes and shapes of things that “package” has been used to describe, including an individual stratum, several strata, a sequence of stratified rocks, a temporal sequence of rocks, an areally restricted outcrop of a distinctive rock or group of rocks, fault blocks—even tectonic terranes. The definition that makes the most sense to us is that “package” and “packet” are the latest geologic buzzwords. So is “scenario,” which ought to be replaced with “hypothesis.”

The *Chicago Manual of Style* is a standard for scientific journals and is probably the best reference for these matters. We have learned that a new edition of *Suggestions to Authors of Reports of the U.S. Geological Survey*, a long-time standard for authors, may be printed soon. Melba Murray has just published a second edition of her excellent book, *Engineered Report Writing*. We also recommend Robert L. Bates’ new little book, *Writing in Earth Science*, published by AGI (\$3.95); it covers 95% of the “housekeeping” problems we encounter.

## Sequel to “Comments From the *Geological Society of America Bulletin* Editors”

The positive reaction of many *Bulletin* readers to our September 1989 Comments about misuse and overuse of words emboldens us to write a sequel. First, we wish to share the readers’ views on some of our comments about style.

To our assertions that it is poor style to allow inanimate objects to be possessive, Robert Bates snorted: “Does that mean I should not say ‘the rocket’s red glare,’ or ‘the dawn’s early light?’ Nuts!” We respond, “touché!” He also said that his university has a department of classics, and although he realized that it probably should be properly termed Department of Classical History and Literature, he wasn’t going to tell that department to change its name. We agree with him on that point, but we still think it is poor style to make plural nouns out of certain geologic adjectives, such as “lithic” to “lithics,” and “clastic” to “clastics.” Similarly, making “basaltic” into “basaltics,” and “geologic” into “geologies” should also be discouraged.

Dr. Bates shared some other pet peeves with us, including “little pomposities” such as “prior to” for “before” and “is dependent upon” for “depends on.” He said, “Encountered in reading, these are like the bump-bump, bump-bump on an old highway. They don’t slow you down much, but they take a lot of pleasure out of the trip.”

Several readers maintained that language actively evolves, and that we editors should flow with that tide, because rigorous editing may stultify creativity. We appreciate these sentiments, and we encourage innovation, but we maintain that poor syntax, excessive jargon, or prolific buzzwords may obfuscate an author’s message. It is the author’s scientific responsibility to write a story that readers will understand, rather than to make an exercise in creative prose. The editor’s responsibility is to help an author present his/her message as clearly and succinctly as possible for the majority of readers. As an example, we shall continue to ask authors to rewrite sentences such as “Like, hey, dude, ah, yuh know, whoaah!” Even though that phrase has currency and unequivocal meaning in some circles, it conveys little scientifically to us.

- The “datum/data” controversy prompted the most responses to our September 1989 Comment; however, we shall cleave to the convention that *data are plural*, because instances arise where we need to retain the clear use of “datum,” such as a topographic datum, a geodetic datum, an age datum, and a stratigraphic datum. Incidentally, *data show nothing*. It is the analyst’s *interpretation* of the data that may yield some kind of a conclusion. Users of seismic reflection data tell us that many of those data “show” nothing unambiguously without interpretation.
- Jess Johnson compared “further” and “farther”: “You wouldn’t say ‘I’m going fur away’; therefore ‘far, farther, and farthest’ for distance. The lawyer, when he finished cross examination, said ‘no further questions’; it would sound strange to say ‘no farther questions,’ and so use ‘further’ in the context of ‘additional.’” Dr. Johnson also admonished producers of manuscripts on word processors to proofread a hard copy rather than a screen. We agree from the nature of the errors we see on word-processed manuscripts and from our own experiences with them.

- Mason Hill pointed out that “faults do not move”; thus it is improper to talk about “fault movement” and how “a fault moved through time.” Movement (of one block relative to another) may occur *along* a fault, a fault may offset something, and it is correct to talk about fault *displacement*.
- Amos Salvador maintained that “facies” is the most overworked and ambiguous term in the geological vocabulary. He pointed out that the *AGI Glossary of Geology* (1987) has seven different definitions of “facies.” Without additional modifiers, such as “biofacies,” “lithofacies,” or “metamorphic facies,” the term may be meaningless out of context. For that reason, Salvador recommended, and we concur, that the use of “facies” should be avoided if clarity of expression is desired.
- The use of “young” as a verb as in “the stratified sequence *youngs* to the west,” is anathema to several stratigraphic readers. They and we prefer to say that “the stratified sequence is younger to the west.” A nautical reader called attention to the fact that “westerly” is a nautical term; thus, geologists should say “the rocks were thrust *westward*.”
- We are still plagued by the indiscriminate overuse of “show,” especially in figure captions. A recent example was “Map showing the geology of the Hardshell area” whereas “Geologic map of the Hardshell area” has always sufficed in the past. In this regard, we also consider it poor style to write first sentences of paragraphs such as: “Figure 5 shows the isotopic variations of basalt in the Hardshell area.” The first sentence of a paragraph should introduce and even summarize the remainder of the paragraph. It should not be a description of the contents of a figure or repetition of what is already in the figure caption.
- So far, no one has offered definitions for “package,” “packet,” or “bundle” in the geologic context, or defended their use in preference to such good words as “bed,” “stratum,” “unit,” “sequence,” “block,” “domain,” “area,” “region,” and sundry other equally useful words.
- It is still distressing to see authors (and hear speakers) use “compression” for both stress and strain. Among rock mechanicians, “compression” is used only in the context of stress.
- Regrettably, it seems that the frequent use of “lithologies” as a synonym for “rocks” will die only when authors realize they do not say or write “geologies.” Recently we saw that “Essentially four lithologies, each essentially composed of differing mineralogies, comprise the geologies essentially of four counties.” Bah!
- “Superpose” has been preferred in place of “superimpose” since 1888, according to the *AGI Glossary*, because both words mean the same thing. The related word, “superimposition,” has established usage largely in a geomorphic context in association with streams and glaciers. Otherwise, we prefer “superposition,” in the stratigraphic and structural contexts. It sounds strange to talk about the “Principle of Superimposition.”

- We see a creeping tendency to substitute “fabric” for “structure.” This is improper, because *fabric* has always had a singular and historic connotation: “The *fabric* of an object is described by all of the spatial data (*fabric elements*) which it contains. A rock is said to have a *simple fabric* when it contains a single fabric element, such as lineation or foliation. A rock is said to have a *compound fabric* when it contains more than one fabric element, such as lineation or foliation” (with modification from Clark and McIntyre, 1951; see also Oertel, 1962). A fabric element is a penetrative structure on the scale of observation. A single fault is not a fabric element, although if it is one of a multitude of similarly oriented faults on the scale of a county or a state, then it is an element of the fabric defined by all of the faults.
- Why do authors, when submitting a manuscript for consideration for publication in the *Bulletin*, typically write in their cover letter: “Joe Schmoo and myself submit the enclosed manuscript. . . .”? Suppose Joe withdrew, then would the author have written “Myself submits the enclosed manuscript. . . .”? We also see manuscripts “submitted by Joe Schmoo and *myself*” instead of “by Joe Schmoo and me.” *Myself* is a reflexive pronoun and should be used only when “I” is the subject of the sentence.
- Watch and listen for the latest buzzword: “architecture.” It is being used as a synonym for “structure,” “geometry” (even “anatomy”), and diverse structural arrangements, including coils in molluscs (“the helicoidal internal architecture of *Helix pomata*”), the preferred orientation of *c* crystallographic axes in quartz (“the architecture of *c*-axes in the Hardshell quartzite”), the unconformable relations of strata (“the disparate stratal architecture between the Hardshell and Softshell Formation”), the variable attitudes of faults in a mountain range (“the crosscutting architecture of normal and reverse faults in the Hardshell area”), and collages of blocks on the continent scale (“the compressional architecture of Alaska”). Ugh!

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