

General rules and skills in Scientific English writing

Learnt knowledge, own
experience and lessons

Principles of scientific writing

- Different ways of writing – for different purposes
- One style for a specific purpose but not other 朱自清[欧游杂记]
- Course at universities mainly literary writing
- Different from scientific and technical writing

What differences

- Literary writing
 - Feeling
 - Emotion
 - Opinion
 - Persuasion
 - Language of extraordinary beauty and complexity, fascinating metaphors
- Scientific writing
 - Dispassionate
 - Factual recording
 - Language of prosaic words of certain meaning, organized simply into precise phrases, clauses, sentences and paragraphs

Scientific writing is not cool-blooded

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- Scientists are human beings
- Scientific writing can be filled (more or less) with feeling, opinion and persuasion

Scientific writing is not DULL

- A clear sequence of new information can be fascinating
- Dullness can result when the writers give up the ornaments of literary writing
- But clarity makes readers enjoy the comprehension and not notice the loss of ornaments

- For what science tries to eliminate, good art seeks to provoke – mystery, which is lethal to the one and vital to the other.

Scientific writing and science writing

- Scientific writing: written by scientists for a special group of scientists
- Science writing: by (sometimes) scientists and journalists for an audience of nonscientists (or scientists reading outside their own narrow discipline)

Basic purpose of scientific writing

- To record (archival function of journals)
- To inform peers
- To educate students (the next generation of scientists)

What are the factual problems against the three basic principles

- Authors ignored the archival function
- Ignored the educational function
- Tried to sound “scholarly”

Style of scientific writing

- It is not only the writing style
- But also the basic organization of a scientific paper
- The editorial style
- The topographical style

General style in scientific writing

- Simple and clear
- The aim is not to entertain or paint a pretty picture, but to inform
- Striving for clarity
- Examples of Lincoln's Gettysburg Address
 - Total in 267 words of which 196 one-syllable words
 - Look at the old Bush

George Bush addressing the National Governors' Association

- While the press is here, was there – did the Democratic governors meet, and is there any feeling that we shouldn't press to try to get something done by March 20th? Do we – is there – can anyone – is there a spokesman on that point? Because what I would like to suggest – not that you'd have to sign every 't' and 'i' but that we urge congress to move by that date. And if that date isn't good, what date? Is there any feeling on that one?

The second general style in scientific writing

- Organization of the paper
- IMRAD organization

Specific style in scientific writing

- Manuals of organizations
- Guidelines of journals
- Thus carefully read “Instructions to authors”
 - never read it later than your supervisors or the one who read your manuscripts
- Follow the instructions strictly

What are important in Instructions concerning style

- Highly specific information that defines the editorial and topographical personality of a journal
- Basics of how and where to submit
- Authors neglect these rules will get “Rejection” letter!

Spelling and Grammar

- Use correct grammar and spelling
- UK or US English? Colour or color?
- Consistence may help avoid confusing
- Minor spelling difference does have different meaning: phosphorus and phosphorous?
- Misspelling often cannot be checked by the computer!

Rules in writing numbers (please memorize)

- Spell out one-digit numbers (one to nine) and use Arabic numbers for all larger:
- One for the money, two for the show
- All 13 of us went to the lecture

Rules in writing numbers (2)

- Spell out any number that starts a sentence:
- Thirteen of us went to the lecture

Rules in writing numbers (3)

- Use numerals whenever numbers are followed by units of measure:
- I added 3 ml of distilled water
- Exception: if “numerals and units” starts a sentence, spell out both numbers and unit
- Three milliliter of distilled water was added.

Rules in writing numbers (4)

- In a series of numbers, if any of the number is 10 or above, write numerals.
- I did 4 experiments on Monday, 5 on Tuesday and 11 on Wednesday.

How to write date

- Standard style: December 29, 2005
- In US and Canada: 12/29/05
- In Europe: 29/12/05
- In China: 05/12/29
- Generally accepted style in scientific writing: 29 December 2005 or 29 Dec. 05

Topographical style

- Read and follow the “Instructions to authors”
- Read a recent article in the journal to which you are going to submit your manuscript:
 - Headings and subheadings
 - Footnotes allowed?
 - Literature citation style
 - Format of tables and figures (legends)
 - Do not use 宋体或任何中文字体
 - Left justification

The English language

- English is a wonderful language
- Inexhaustible ways of expressing a same meaning by playing words: I cannot stand sitting
- International language (German, French and Japanese journals change to English)
- Universal in scientific writing

Responsible use of English

- English is a must for scientist
 - Keep up with the literature or contribute to the literature
 - No longer can you ask somebody to translate manuscript or search the literature

Use English simply

- Short and simple words
- Short and straightforward sentences
- Mother tongue of most scientists is NOT English

Grammar of scientific writing

- You have learnt English grammar probably from your primary school time and may have heard of:
 - Do not split infinitive
 - Do not end a sentence with preposition
 - Do not use singular subjects with plural verbs
 - Do not use double negatives

Rules all have exceptions

- Just forget the above rules
- In scientific writing the main purpose is clarity
- Remember “grammar of meaning” or “logical grammar” in scientific writing

Parallelism in scientific writing

- First, secondly, at last. – first, second, last
- Aluminum is light, ductile and has strength.
 - Aluminum is light, ductile and strong.
- A, B, C(,) and D structure.

Agreement of subjects and verbs

- She runs and they run.
- A series of experiments (was/were) done.
- A number of experiments (was/were) done.
- A bunch of grapes (is/are) on the table.
- A bunch apples (is/are) on the table.

Agreement of subjects and verbs 2

- “...3 ml was/were added”
- When should you say “3 ml were added”?
 - 3 ml of reagent might be added sequentially, 1 ml at a time and you can say then: 3 ml were added.

Agreement of subjects and verbs 3

- Plural in a singular form such as:
 - If this criteria is met, we will have no problems. (criterion)
 - This media takes glucose. (medium)
 - This data is incomplete. (datum)
 - Mycelium – mycelia
 - Fungus – fungi
 - Much more – find and remember

Agreement of subjects and verbs 4

- The *use* of various acids and other reagents often **result** in marred surfaces.

Split of infinitives

- I fail completely to understand rigid rules.
- I fail to understand completely rigid rules.
- I fail to understand rigid rules completely.

Importance of Syntax

- I knew a man with a wooden leg named George.
- I knew a man named George who had a wooden leg.

Importance of Syntax 2

- He was the leader of a political party that he said could best handle the coming chaos under his leadership.
- He was the leader of a political party that he said could best handle under his leadership the coming chaos.

Importance of Syntax 3

- Only I hit him in the eye yesterday.
- I only hit him in the eye yesterday.
- I hit only him in the eye yesterday.
- I hit him in only the eye yesterday.
- I hit him in the only eye yesterday.
- I hit him in the eye only yesterday.
- I hit him in the eye yesterday only.

Importance of Syntax 4

- Politics are almost as exciting as war, and quite as dangerous. In war you can only be killed once, but in politics many times. – Winston Churchill
- Better: you can be killed only once.

Importance of Syntax 5

- Just today we visited my aunt.
- Today just we visited my aunt.
- Today we just visited my aunt.
- Today we visited just my aunt.
- Today we visited my just aunt.

Importance of Syntax 6

- While having lunch, the reaction mixture exploded.
- In analyzing the data statistically, the *Salmonella typhimurium* infections were indeed rare.

Importance of Syntax 7

- Difficult parts to bring about syntax problems: participles, dangling or otherwise.
- Rule to remember: Modifiers should be as close as possible to the words, phrases, or clauses they modify.

Importance of Syntax 8

- I almost wrote a check for \$1,000.
- I wrote a check for almost \$1,000.
- I went to the town that was 20 miles away on Tuesday.

There is/are “problem(s)”

- There is nothing wrong with a sentence beginning with “there” = Nothing is wrong with a sentence beginning with “there”.
- There are many other sentences that can be improved by avoiding the “There” opening. = Many other sentences can be improved by avoiding the “There” opening.

Use of words in scientific writing

- Long words mean little things. All big words have little names, such as life and death, peace and war, or dawn, day, night, love and home. Learn to use little words in a big way. It is hard to do. But they say what you mean. When you don't know what you mean, use big words. They often fool little people.

Choose the right words

- Unique words, those of certain meaning – always first choice.
- The choice is between or among several synonymous – choose the short and common one. (mostly the common one is the shortest)

The name words (nouns and pronouns)

- Definition of noun in scientific writing: a person, place, thing or idea.
- Proper and common nouns

How to distinguish proper and common nouns

- Proper nouns
 - Capitalized
 - Singular
 - The Yangtze River
 - The Taihu Lake
- Common nouns
 - Not capitalized
 - Either singular or plural
 - River or rivers
 - Lake or lakes

Useful tips for writing

- Proper nouns
- *Lactobacillus*
- *Streptococcus*
- Common nouns
- lactobacilli
- streptococci

Collective and mass nouns

- The audience is restless.
- The couple owns a house.
- The couple do not live together.
- The committee of scientists were from several scientific disciplines.

Collective and mass nouns 2

- A total of 48 Petri dishes were in the autoclave.
- A total of 48 Petri dishes was in the autoclave.
- NOTE: apply the rule of meaning (logical grammar)

Collective and mass nouns 3

- A number of test tubes is/are on the table.
- The number of test tubes on the table is/are four.

Collective and mass nouns 4

- Amount – an amount of people = poor English
- Less – less taste
- Number = a number of people
- Fewer – fewer calorie

Pronouns in scientific writing

- The antecedent of a pronoun must agree with the number of the pronoun. (singular pronoun must have a singular antecedent)
- Make sure that the antecedents of your pronouns are clear.

Pronouns in scientific writing 2

- No one yet had examined the structure of the human kidneys. Versalius have examined them only in dogs.

It, it's and its

- Its not good science.
- It's not good science.
- A dog knows its master.
- A dog knows it's master.

It, it's and its 2

- It's alright to give raw milk to your baby, but first boil it.
- I finished your paper review, it seems not good.
- Free information about VD. To get it, call 555-7000.
- Rule: it follows as close as possible to its antecedent.