Some Aspects of English in Technical Writing

To succeed in a science and become an adequate practitioner in it, students must have...

‘better expression skills than are necessary for almost any other course or vocation. Vagueness, ambiguity and inability to express clearly and succinctly are intolerable in a scientist.’

Towns (1990)
Common Convolutions of English in Technical Writing

Items 1 - 5 are after Lindsay (1995)

1 Clusters of nouns
   (Germanic construction)
   - “Leaf copper accumulation observations”
   - “Amino acid digestion analyses”
   - “Testis growth rate figures”
   - “Wool filament quality parameters”
   - “Plasma urea nitrogen concentrations”

Which are the word bases?
How many words are in the bases?

2 Adjectival clusters
   - “The non-nitrogen supplemented group”.
   - “The maximum net returns above feed cost ration.”

3 Sentences beginning with subordinate clauses
   “Thus, although there were too few plots to show all of the interactions which we sought [subordinate clause], under the conditions of the experiment [subordinate phrase], copper and zinc acted additively”.
   
   cf. “Thus, copper and zinc acted additively under the conditions of our experiment although there were ....”.
Use of imprecise words
- “Considerable”
- “Quite”
- “Somewhat”
- “Very”
- “Rather”

Use of double negatives
- “It is not uncommon”  “It is common”
- “It is unlikely it won’t work”  “It is likely to work”

Helpful Rules in Organizing Your Writing

The Power of Position (after Lindsay, 1995)
“Fleming, in 1929, discovered penicillin after a bacterial plate he was culturing became contaminated with a spore of the fungus Penicillium.”

Facts conveyed
- The discoverer of penicillin
- The date of the discovery
- The way it came to notice
- The name of the organism involved
- What it contaminated
Changing the emphasis

- **On antibiotics**
  “Penicillin was discovered in 1929 ...”

- **History**
  “In 1929, Fleming discovered ...”

- **Serendipity**
  “A chance contamination by ...”

The desired emphasis is placed first.

The tense

- The work reported is finished.
- Because of biological variations, it is not reasonable to expect the same results if the work is repeated.

The present tense is reserved for conclusions and generalizations which you believe are still valid at the time of writing.

The same rule applies when describing the work of others.
Readability
Good sentences can be read and understood in one pass.

Precision, clarity, and brevity
Three essential criteria of scientific writing which should always be considered in that order.

Consequences of brevity

Used cars: Why go elsewhere to be cheated?
Come here first.
Man, honest. Will take anything.
Dog for sale: Will eat anything and is fond of children.
Mixing bowl set designed to please a cook with round bottom for efficient beating.
For sale: Antique desk suitable for lady with thick legs and large drawers.
Lost: Small poodle – Reward. Neutered, just like one of the family.
Tired of cleaning yourself? Let me do it.
Hindrances to readability

1. **High average length of sentences**
   Advocates of “plain English” say 15 – 20 words (Seeley, 1998)

2. **Long words**
   Words of 3 or more syllables
   Except:
   Personal and place names.
   Verbs over 2 syllables because of –ing, -ed or –es.
   Plural nouns over 2 syllables because of –es.

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Guides to readability

**The Fog Index** (Gunning, 1952)

**Procedure**

1. Take an approx. 100-word sample (including a sentence end).
2. Count the number of sentences.
3. Count the number of long words.

\[
\text{Fog Index} = \left[ \left( \frac{\text{No. of words}}{\text{No. of sentences}} \right) + \left( \frac{\text{No. of long words}}{\text{Total no. of words}} \right) \right] \times 0.4
\]

**Readability**

5  Easy
10  More difficult
15  Difficult
20  Very difficult
### The Flesch/Flesch-Kincaid Readability Tests
Available as a tool in Microsoft WORD 2010©.

#### Flesch Reading Ease

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 - 100</td>
<td>Easily understandable by an average 11 year old student</td>
</tr>
<tr>
<td>60 – 70</td>
<td>Easily understandable by 13 to 15 year old students</td>
</tr>
<tr>
<td>0 – 30</td>
<td>Best understood by university graduates</td>
</tr>
</tbody>
</table>

#### Flesch-Kincaid Grade level

Score corresponds to a US grade level e.g. text scoring 8.2 is expected to be understandable to an average Grade 8 student (12 – 14 year olds).

"Green Eggs and Ham" (Dr. Seuss) scores -1.3

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### Paragraphing

#### Problems with paragraphs

- Too long: more than one topic (idea) expounded.
Problems with paragraphs

• Too short: one topic dealt with in more than one paragraph.

Problems with paragraphs

• Poor linkage between paragraphs (topics).
Paragraphs are used

1. to break a large work so that it is easier to absorb.

Paragraphs are used

2. to group ideas in a work i.e. a paragraph should contain sentences expounding the same topic (homogeneity).
   
   *Keeping one idea to one paragraph.*

   “A paragraph is essentially a unit of thought, not of length”
   
   (Fowler, 1965)
Paragraphs are used

3. to present a logical progression of ideas (paragraphs).

A good paragraph has a

• Topic sentence
  This leads the paragraph and gives the reader an idea of what the paragraph is about. This is then supported by other sentences.

• Summary or link sentence
  Used to emphasize the key point of the paragraph and/or prepares the reader for a related idea in the next paragraph (transitioning).
Coherence and flow

- Between paragraphs.

- Logical flow in ideas.
  - One thought following from, or flowing to another.

- Signs of paragraph coherence.
  - Repeated thematic elements; phrases; words.

Tone in writing

Remembering that:

- hypotheses are forever open to disconfirmation.
- science is constitutionally provisional and uncertain.

We can understand the use of “hedging”.

Hedging is central to effective argument in scientific writing (Hyland, 1996).
What is hedging (Lakoff, 1972)?

“words whose job it is to make things more or less fuzzy” (Lakoff, 1972)

“Hedging is a rhetorical means of gaining reader acceptance of claims, allowing writers to convey their attitude to the truth of their statements and to anticipate possible objections” (Hyland, 1996).

The precise and the imprecise

Communication in science is normally precise
... yet, a scientific writer can chose not to be “explicit and precise” because there may be:
• inadequacy in the referred scientific claim(s),
• a desire to express “uncertainty about a scientific issue or reflect the state of knowledge”

Behnam et al. (2012)
Examples from papers

“This higher yield is unlikely to be due to substrate and pH factors alone as . . . .”

“Thus, it could be said that total population size in . . . .”

“This suggests that a physiological change affecting enzyme synthesis . . . .”
Effect on citing

Care must be taken that hedges used in original writings are not changed when they are cited or paraphrased.

This has the potential of changing the uncertainty of past results.

Punctuation: An example

The comma

“A most difficult punctuation mark to use well.

... essential for clear writing ...

The person who has learned how to use commas has learned now to write.”

(Seeley, 1998)
Punctuation

Famous Commas (Bryant, 1983)

The fatal comma
Warrant signed by Alexander III:
“Pardon impossible, to be sent to Siberia.”
Changed by Czarina Fyodorovna by shifting the comma.
The man was set free.

The blasphemous comma
In erroneous editions of the King James bible, Luke 23:32, in describing the other men crucified with Christ read:
“And there were also two other malefactors.”
A comma is missing.

The million-dollar comma (Bryant, 1983)
Clerical error meant that an 1872 U.S. government tariff act listed duty-free items including:
“Fruit, plants tropical and semi-tropical.”
Import duty was lost for two years as importers successfully contended that all tropical and semi-tropical plants were exempted.
The comma was in the wrong place.

The yuletide comma
There should be a comma in the title of this Christmas carol
“God bless you merry gentlemen.”
Where should the comma be placed?
The extra comma
Rogers vs. Bell Aliant (2006)

“Subject to the termination provisions of this Agreement, this Agreement shall be effective from the date it is made and shall continue in force for a period of five (5) years from the date it is made, and thereafter for successive five (5) year terms, unless and until terminated by one year prior notice in writing by either party.”

Rogers thought they had a minimum 5-year agreement. Bell Aliant tried to terminate the agreement before 5 years by giving a one year notice and was brought to court. At trial, judgment was in Bell Aliant’s favor because of the second comma.

The missing comma
In a CV

“My interests include cooking dogs and interesting people.”
The Oxford comma (a.k.a. the serial comma)

A comma used before “and” or “or” to remove ambiguity.

Book dedication

“To my parents, Ayn Rand and God.”
(Two people: Ayn Rand and God)

“To my parents, Ayn Rand, and God.”
(Four people: Parents, Ayn Rand and God)

Sandwiches

“My favourite types of sandwiches are pastrami, ham, cream cheese and jam and peanut butter.”
Is it cream cheese and jam or jam and peanut butter?

The gymnastic comma (nothing to do with the matter at hand)
A Dear John

Dear John,

I want a man who knows what love is all about. You are generous, kind, thoughtful. People who are not like you admit to being useless and inferior. You have ruined me for other men. I yearn for you. I have no feelings whatsoever when we’re apart. I can be forever happy - will you let me be yours?

Jane
Dear John,

I want a man who knows what love is. All about you are generous, kind, thoughtful people, who are not like you. Admit to being useless and inferior. You have ruined me. For other men, I yearn. For you, I have no feelings whatsoever. When we're apart, I can be forever happy. Will you let me be?

Yours,
Jane
Expression (After Conn, 1992)

Proof-reading
“The French aristocracy were sitting on a volcano and thus they could not wee.”

Spelling
“The French revolution would of been grate but Robespierre ruined it’s glorious aims with his rein of terror.”

Clarity
“For many years after the 1917 revolution the government of Russia depended on the organs of the secret police.”

Meaning
“Vasco da Gama was a great sailor who circumcised the world with a 30-foot clipper.”
Consider . . .

**Independent proof-reading**

It can be difficult to proof read your own document especially over a long gestation period.

Consider . . .

**Maturing**

The written text will benefit from letting it “mature” *i.e.* left to sit for awhile before final re-work.

- Very possible you will look at the document with “different eyes”.
- Implies allowing for sufficient production time.
Newspeak

Some of *The Herald Sun’s* Best Newspaper Headlines of 2000

- **Herald Sun**
  - *Shocking Text Message Claims*
  - **How I Played Around With Tiger**
  - Police need your help to find the men responsible for a brutal pack rape
Stolen painting found by tree

Iraqi head seeks arms
Kids make nutritious snacks

Panda mating fails; veterinarian takes over.
Two sisters reunited after 18 years at the checkout counter

Police begin campaign to run down jaywalkers
Miners refuse to work after death

Typhoon rips through cemetery; hundreds dead.
Police squad helps dog bite victim
She has no rigors or shaking chills, but her husband states she was very hot in bed last night.
On the second day the knee was better and on the third day it disappeared.

By the time he was admitted, his rapid heart had stopped, and he was feeling better.
The patient has been depressed since she began seeing me in 1993.
**Source**
