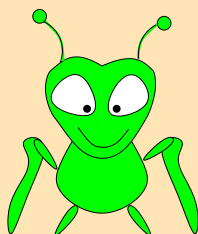


# *Grasshopper's Compendium*

*C. Pozrikidis*



*Version 26.01*

**CHESTER & BENNINGTON**



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Version 26.01

C. Pozrikidis

CHESTER & BENNINGTON

2025



# GRASSHOPER'S COMPENDIUM

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# Contents

Preface	xv
Part A : Green Leaves	1
A.1 Buy and read a writing guide, own a thesaurus . . .	1
A.2 The colon (:) is a useful punctuation mark . . . . .	2
A.3 Say it without a colon . . . . .	2
A.4 Including and such as . . . . .	2
A.5 The colon in a computer code . . . . .	3
A.6 The semicolon (;) is a useful punctuation mark . . .	3
A.7 Avoid the fact . . . . .	4
A.8 Do not write “I grew up in the 1970’s” . . . . .	5
A.9 Remember and use the word “consistent” . . . . .	5
A.10 The word “suggest” is too soft . . . . .	5
A.11 Put a comma before an enumerative and, or, but . .	6
A.12 Each paragraph should have a clear objective . . . .	6
A.13 Put no more than ten sentences in one paragraph . .	6
A.14 Pay attention to proper capitalization . . . . .	7
A.15 Use technical terms and abbreviations with caution .	7
A.16 When writing the Abstract, use passive voice as much as possible but not exclusively . . . . .	8
A.17 Do not start the Introduction with “In this paper, we consider . . .” . . . . .	8
A.18 Do not start the last paragraph of an Introduction with “The paper is structured as follows” . . . . .	9
A.19 Follow the <i>subject-verb-object</i> structure, put important explanations and reasoning at the beginning . . . . .	9

A.20	Parallel structure is appealing in spite of the repetition	10
A.21	Like legalese, technical writing should be purposeful and immune to misinterpretation . . . . .	10
A.22	Latin elements add a touch of class . . . . .	11
A.23	Keep in mind and use the “ <i>either or</i> ” and “ <i>neither nor</i> ” structures . . . . .	11
A.24	Omit the period at the end of enumerated items in a list . . . . .	11
A.25	Do not use technical words, concepts, or terms that you cannot properly explain or describe . . . .	12
A.26	Avoid hyperbole . . . . .	12
A.27	Split your work into different papers only when absolutely necessary . . . . .	13
A.28	Do not write while climbing on a learning curve . . .	13
A.29	Make precise references . . . . .	14
A.30	Do not write “ <i>The above equation</i> ” . . . . .	14
A.31	Use proper grammatical structures . . . . .	15
A.32	Do not start a sentence with “ <i>And</i> ” or “ <i>But</i> ” . . . .	15
A.33	Put the “ <i>however</i> ” at the beginning . . . . .	15
A.34	Always define acronyms, twice if necessary . . . . .	16
A.35	Avoid idle and pretentious words . . . . .	16
A.36	Pay attention to hyphenated words . . . . .	16
A.37	Avoid abstract nouns . . . . .	17
A.38	Pack every sentence with new information . . . . .	18
A.39	The Introduction should have no or few equations .	18
A.40	Build interest in the Introduction . . . . .	18
A.41	Do not use meaningless sentences and clichés . . . .	19
A.42	Use interludes . . . . .	19
A.43	“Hands down” is an adorable colloquialism . . . . .	19
A.44	Refuse coercive and gratuitous citations . . . . .	20
A.45	Minimize and carefully select your references . . . .	20
A.46	Do not rely on spell-checkers . . . . .	21
A.47	The Conclusion should have no or few equations . .	21
A.48	The common “ <i>more importantly</i> ” is incorrect . . . .	22
A.49	Do not make caustic remarks . . . . .	22



A.50	Avoid superlatives . . . . .	23
A.51	Use verbs instead of nouns . . . . .	23
A.52	Define symbols at the end of a sentence . . . . .	23
A.53	Choose your literals . . . . .	23
A.54	Choose each word carefully . . . . .	24
A.55	Do not nondimensionalize narration . . . . .	24
A.56	Use single dash or double dash, as appropriate . . . . .	24
A.57	Read good journalism and literature . . . . .	25
A.58	Write a few paragraphs each day . . . . .	25
A.59	Look up new words . . . . .	25
A.60	Do not write bad sentences thinking that you will return to fix them . . . . .	26

## **Part B : Yellow Leaves 27**

B.1	Do not criticize other authors . . . . .	27
B.2	Do not get discouraged . . . . .	28
B.3	When revising a manuscript to address reviewers' comments, make a judgment call . . . . .	28
B.4	Hard concepts made simple . . . . .	29
B.5	Be appreciative of good editors and grateful for free copy editing . . . . .	29
B.6	Do not agree to become a coauthor in a paper with more than two other authors . . . . .	30
B.7	Thicken your skin . . . . .	30
B.8	Do not criticize a prolific author . . . . .	31
B.9	Do not criticize a non-prolific author . . . . .	31
B.10	Do not accept honorary and coercive coauthors . . . . .	32
B.11	Do not underestimate the huge amount of work and commitment it takes to write a book . . . . .	32
B.12	Deliberate plagiarism is a sin . . . . .	33
B.13	Do not set as an objective the writing of a paper . . . . .	33
B.14	You are allowed to write papers that are not earth shattering . . . . .	33
B.15	Do not cut and paste . . . . .	33

B.16	Read carefully all sources that you cite . . . . .	33
B.17	Do not pretend that you have discovered something that has already been discovered . . . . .	34
B.18	When reviewing someone else's paper, do not recommend rejection . . . . .	34
B.19	The most important decision to be made is what problem to solve or what line of research to pursue .	34
B.20	Know when you strike gold . . . . .	35
B.21	Interdisciplinary endeavors can be ridiculous . . . . .	35
B.22	Look for good ideas . . . . .	35
B.23	Move on every few years . . . . .	36
B.24	Weigh facts more than promise . . . . .	36
B.25	Learn how to typeset documents in Latex . . . . .	36
B.26	Do not make extravagant statements . . . . .	37
B.27	A professor can have a profound impact on someone's life . . . . .	37
B.28	Allow for the possibility that you may not be as smart as you think . . . . .	38
B.29	Do not become a novelist . . . . .	38
B.30	It is unlikely that you have invented an earth-shattering concept or a truly novel idea . .	38
B.31	Overcome functional fixedness . . . . .	39
B.32	Allow for the possibility that you may not be as important as you think . . . . .	40
B.33	Keep developing your skills . . . . .	41
B.34	Thinking is harder than you think . . . . .	42
B.35	Do not hire others to do your thinking . . . . .	42
B.36	Give yourself enough downtime . . . . .	43
B.37	Do not confuse activity with accomplishment . . . . .	43
B.38	Presenting a seminar or giving a lecture is not a performing art . . . . .	44
B.39	Be a minimalist . . . . .	44
B.40	Ask direct and polite questions after a seminar . . .	45
B.41	Do not insult a seminar speaker . . . . .	45
B.42	A research grant is a link in a logical chain . . . . .	46

B.43	A professor is not a celebrity . . . . .	46
B.44	Academic free-lancing is meaningless . . . . .	47
B.45	Never use canned computer code, including molecular dynamics code . . . . .	47
B.46	Do not fall prey to a publishing pyramid scheme . .	47
B.47	Consider writing a book . . . . .	48
B.48	How to write a book . . . . .	48
B.49	Publicize your work with modesty . . . . .	49
B.50	Don't be ridiculous . . . . .	49
B.51	Do not seek honors and awards . . . . .	50
B.52	Do not declare your desk, office, laboratory, or cubicle a Center . . . . .	51
B.53	Do not issue Press releases . . . . .	51
B.54	Do not append acronyms or a stack of titles under or after your name . . . . .	51
B.55	Do not complain incessantly . . . . .	51
B.56	Be grateful for what you have . . . . .	52
B.57	Becoming an administrator is not a natural career path . . . . .	52
B.58	The more things change, the more they stay the same . . . . .	53
B.59	Express genuine admiration . . . . .	54
B.60	Keep in mind that most students have been short-changed . . . . .	54
B.61	Do not flatter indiscriminantly . . . . .	55
B.62	Show your students tough love . . . . .	55
B.63	Consider whether you are prepared and willing to supervise graduate students . . . . .	55
B.64	Stay clear of people with aggressive and overbearing personalities . . . . .	56
B.65	Remember the fallacy of the intelligent professor . .	56
B.66	Treat senior professors, colleagues, and others with respect . . . . .	57
B.67	Remember who hired you . . . . .	58
B.68	Do not be passive aggressive . . . . .	58

B.69	Treat junior professors, colleagues, and others with respect . . . . .	59
B.70	Avoid passing judgment . . . . .	59
B.71	Do not criticize anyone who is not present (including the dead) . . . . .	59
B.72	Keep your mouth shut . . . . .	60
B.73	Do not write exaggerated, inaccurate, or meaningless letters of reference . . . . .	60
B.74	Participating in a hiring committee does not make you an employer . . . . .	60
B.75	The staff are not your servants . . . . .	61
B.76	Do not turn a research proposal into a paper . . . . .	61
B.77	Ignore unsolicited advice and discard recipes for success . . . . .	61
B.78	Some things are inevitable . . . . .	62
B.79	When the Devil comes knocking on your door, he will pretend to be your friend . . . . .	62
B.80	Beat them in their own game . . . . .	63
B.81	Do not punitively fail graduate students . . . . .	63
B.82	Behave like a Professor . . . . .	64
B.83	Not getting tenure means nothing . . . . .	64
B.84	Remain humble and meek . . . . .	64
B.85	Try Unix or Linux . . . . .	65

## **Part B : Red Leaves 67**

C.1	Adjust your prism . . . . .	67
C.2	Do not reject or ridicule what you don't understand . . . . .	68
C.3	Wait for two weeks . . . . .	68
C.4	There are plenty of good people . . . . .	68
C.5	Do not accept sacrificial lambs . . . . .	69
C.6	Do not be afraid to be an outcast in a flawed culture . . . . .	69
C.7	A professor can be a hero . . . . .	70
C.8	Detect and stay away from manipulators . . . . .	71
C.9	On the sublime . . . . .	71

C.10	The erosion of morals is fast . . . . .	72
C.11	Do not make others feel crummy . . . . .	72
C.12	Use a thermometer . . . . .	73
C.13	Be giving and be generous . . . . .	73
C.14	Charm is overrated . . . . .	73
C.15	Some things are priceless . . . . .	74
C.16	You don't have to be a professor to be an expert . .	74
C.17	Uploaders and downloaders . . . . .	75
C.18	You can learn something from everyone . . . . .	75
C.19	March forward . . . . .	76
C.20	Do not pretend that all is just fine . . . . .	76
C.21	Do not ask personal questions in small talk . . . .	76
C.22	Work with meraki . . . . .	77
C.23	all alone in the woods . . . . .	77
C.24	Being lazy is a waste of your life . . . . .	78
C.25	Many aspects of life are a zero-sum game . . . . .	78
C.26	Let someone else have a break . . . . .	78
C.27	Sometimes the wrong answer is the best answer . . .	79
C.28	Do not let anyone intimidate or bully you . . . . .	79
C.29	You need at least one good friend or confidant . . .	80
C.30	Dismiss the inner expert . . . . .	80
C.31	Make sure you do not discriminate consciously or unconsciously against others . . . . .	81
C.32	Do not throw anyone under the bus . . . . .	81
C.33	Do not engage in trivial debates (great taste v. less filling) . . . . .	82
C.34	Do not develop schadenfreude . . . . .	82
C.35	You don't have to forgive . . . . .	82
C.36	Denial is a stubborn state of mind . . . . .	82
C.37	Why are professors paid so much? . . . . .	83
C.38	The forgotten academic . . . . .	83
C.39	Do not be ashamed to pray . . . . .	84
C.40	Most people and institutions are apprehensive of new ideas . . . . .	84
C.41	Battle of two wolves . . . . .	85

C.42	Keep your sense of humor . . . . .	85
C.43	Respect those who live in a no-man's land . . . . .	85
C.44	Do not worry about your legacy . . . . .	86
C.45	Think before you subscribe . . . . .	86
C.46	How civilization improves . . . . .	86
C.47	Multiple choice question . . . . .	86
C.48	Help from a position of strength . . . . .	87
C.49	Do not expect or demand gratitude . . . . .	87
C.50	Confront your fears head-on . . . . .	87
C.51	Respect those who got uprooted . . . . .	88
C.52	Be alert . . . . .	88
C.53	Respect the adjuncts . . . . .	89
C.54	Do not set out for the land of no-return . . . . .	89
C.55	Things are not always as they appear . . . . .	90
C.56	Decide what is important for you . . . . .	90
C.57	If you are not qualified for a job, do not apply for, or accept the job . . . . .	90
C.58	Do not make false assumptions . . . . .	91
C.59	Life in the Ivy Tower . . . . .	91
C.60	Do not double dip . . . . .	92
C.61	How to prove a theorem . . . . .	92
C.62	A college or university is a place of learning . . . . .	93
C.63	Good humor lies in the eyes of the beholder . . . . .	93
C.64	Accept and embrace your scars . . . . .	93
C.65	Pay attention to peoples' character, less attention to ideas . . . . .	94
C.66	Leader v. leader . . . . .	94
C.67	Some things are incompatible . . . . .	94
C.68	Distill your decision . . . . .	94
C.69	Respect the fainting goats . . . . .	95
C.70	Being happy is simple . . . . .	95
C.71	Even if nobody else knows, you know . . . . .	95
C.72	Set as a goal to become self-sufficient . . . . .	96
C.73	No good deed goes unpunished . . . . .	96
C.74	Ponder how you see yourself in the world . . . . .	96

C.75 Prepare yourself for the truth . . . . .	97
C.76 Do not accept the first thing that comes along . . .	97
C.77 The real reason that your unpleasant neighbor never sees you . . . . .	97
Your life belongs to you . . . . .	98
<b>Index</b>	<b>99</b>





# *Preface*

I have collected in this little book (a) grammatical and stylistic advice, (b) established and subjective writing procedures and rules, and (c) miscellaneous commentary, observations, thoughts, and truths.

The intended audience includes students, professors, researchers, and anyone interested in the modern world of research and academe or else seeking general behavioral rules and guidelines.

The book is divided into self-contained sections arranged in three parts that can be seen as trees with green leaves, yellow leaves, and red leaves.

I recommend reading sequentially or randomly a few sections each day and contemplating your experiences and meaning during the rest of the day.

My hope is that this book will serve, among other things, as a source of awareness, information, encouragement, affirmation and inspiration to its intended audience.

I apologize if any words or sentences appear to be pretentious or out of place. I will be the first to admit that I have a huge number of flaws.

C. Pozrikidis



*A wise mind jumps quietly and deliberately from thought to thought,  
like a grasshopper*



# Part A

## Green Leaves

*"Sin, even for a non-believer, is when one goes against one's conscience. To listen and to follow your conscience means that you understand the difference between good and evil. God will forgive anyone as long as they behave morally and live according to their consciences."*

Pope Francis

### ***A.1 Buy and read a writing guide, own a thesaurus***

A terrific little book entitled "*The Elements of Style*" is an invaluable resource for information and advice on general and technical writing.

A copy of this book was handed to me gratis by my kind graduate adviser at our first research meeting. I could barely speak and write in English at that time, and some argue I have not improved.

Other excellent books and handy pocket guides are available. A plethora of useful guidelines and presentation rules can be found at the Internet. Acquaint yourselves with these resources and bookmark what you find most helpful. Keep a thesaurus in your pocketbook and bookmark a thesaurus in your browser.

## ***A.2 The colon (:) is a useful punctuation mark***

Metaphorically speaking, the colon is a branching point in a logical tree that leads us to a desired path. For example, you may write: "*Fluid Dynamics: Theory, Computation, and Numerical Simulation.*" A sequence of colons leads us to a chosen destination.

The colon may serve as a gateway to a list or enumeration that would have been awkward to incorporate in a sentence otherwise. For example, you may write: "*The subject of happiness has been addressed from different perspectives: sociological, theological, utilitarian, philosophical.*" However, be aware that the excessive use of the colon as a gateway can be clumsy or otherwise interpreted as a cheap trick.

The colon is sometimes used to provide an explanation, inform of a reason, or warn of consequences. For example, you may write: "*Punxsutawney Phil saw his shadow and returned to his hole: six more weeks of winter were to follow.*" Or you may write: "*The dentist recommended not eating for one hour: the filling was still solidifying.*"

## ***A.3 Say it without a colon***

As a general rule, if something can be said without a colon, it should be said without a colon. For example, the title "*The stretching of a nanotube: An experimental study*" should be rephrased as "*An experimental study of the stretching of a nanotube.*"

## ***A.4 Including and such as***

As an alternative to using a colon, you may use an in-line list introduced by the words "*including*" or "*such as*." For example, you may write: "*The Chinese cuisine offers a variety of delicacies, including spring rolls, Mongolian beef, and wontons.*" A financial adviser may say: "*You should invest in a diverse portfolio, such as that offered by our own huge-cap fund.*"

## ***A.5 The colon (:) in a computer code***

The colon is used extensively in computer programming under a prime directive: *each piece of communicated information should be stated and defined precisely, otherwise a code may crash at an unspecified point for reasons that can be hard to identify.*

The reason for this prime directive is that a computer code may consist of several thousand or more individual pieces, known as functions or subroutines, that may call each other or themselves in lieu of nested Russian dolls.

An error message issued by a well-written code may read: *code bread: function temperature: baking temperature not defined.* Similar message sequences are issued by other complex systems, and are probably issued by the sensors and receptors of complex biological systems.

Similar constructs can be found in the design of xml formatting and object-oriented languages. You may use such constructs in dispensing driving directions to a lost soul.

## ***A.6 The semicolon (;) is a useful punctuation mark***

In formal English, the semicolon separates two or more independent but somewhat related sentences in order to establish a connection or prevent run-off.

For our brain to process a sentence after a semicolon, the sentence preceding the semicolon must be retained, which may require a prohibitively long attention span. For this reason alone, the semicolon should be used sparingly and as a last resort.

You may write: *"Some think that the sun rotates around the earth; in fact, the earth rotates around the sun; or does it?"*

The semicolon can be used instead of the comma in an in-line list involving long items. For example, you may write: *"The central objectives of science are to discover the truth; to create a culture of creativity; and to sustain and perpetuate the intellectual capacity of the human race."*

Sometimes the semicolon can be used instead of the colon (:), as in the title: *"Unidirectional flow; velocity/vorticity formulation."* Whether a colon or a semicolon is appropriate or desirable must be decided by making a judgment call.

## ***A.7 Avoid the fact***

The word *"fact"* is often used improperly as a poor substitute of the words *notion, discovery, statement, idea, feature, attribute*, and others. *Fact* is an easy word prone to misuse and misinterpretation. Pause and think of alternatives before using this word. Avoid expressions such as *"because of the fact," "the fact that," "despite the fact," "in spite of the fact."*

Instead of writing *"because of the fact that the theory is deficient, a compelling argument cannot be made,"* write *"the theory is deficient in that a compelling argument cannot be made."*

Instead of writing *"the fact that the deformation is small indicates that the equations can be linearized,"* write *"because the deformation is small, the equations can be linearized."*

Instead of writing *"Despite the fact that elephant left the room, the elephant was still in the room,"* write *"Even though the elephant left the room, the elephant was still in the room."*

Instead of writing *"in spite of the fact that nobody supported her ideas, she proceeded by herself to develop an elegant theoretical framework,"* write *"even though hardly anybody supported her ideas, she proceeded alone to develop an elegant theoretical framework."*



### ***A.8 Do not write “I grew up in the 1940’s”***

Write instead “*I grew up in the 1940s.*” The alphanumerical 1940s stands for “*forties*,” the erroneous 1940’s stands for the nonsensical “*forty’s*.” Pause and think before using any apostrophe, especially when a plural or possessive form is involved.

When was the computer invented? In the 1960s. When was the Internet developed? In the 1970s. When did clothing become outrageous? In the 1980s. Nothing remarkable happened in the 1990s. Some argue that the decay of morals began in the 1920s.

### ***A.9 Remember and use the word “consistent”***

The word *consistent* can be used to convey agreement, disagreement, or conflict without prejudice. For example, you may say that “*the findings of a computational experiment are not consistent with Furcolo’s lemma.*” Either the experiments, or Furcolo’s lemma, or both could be wrong.

A forensic expert may be asked: “*Are the teeth marks at the butter stick consistent when the jaw size of the grizzly bear who has confessed to eating the broccoli?*” The bear will roll her eyes and ask for continuance due to boredom-induced hibernation.

### ***A.10 The word “suggest” is too soft***

Soft words that leave room for doubt and ambiguity are not acceptable in science, technology, engineering, and mathematics (STEM). Soft words are used extensively in soft and qualitative sciences where arguments and suggestions instead of assertions and proofs are typically made. Avoid soft words and use instead strong words, such as *show, demand, follow, demonstrate, chose, prove, lead to*. Instead of writing “*The veracity of Theorem A proves the validity of Equation B,*” write “*Equation B follows from Theorem A.*”

### ***A.11 Put a comma before an enumerative and, or, but***

Write "*this, that, and the other,*" or "*this, that, or the other,*" or "*this, that, or both,*" or "*this, that, but also that.*" For example, send out for lunch by asking for village bread, goat cheese, and wrinkled black olives (Mediterranean diet.)

Do not enumerate more than three items at a time, otherwise the first enumerated item will not be retained. A spiritual leader once said that "*We must have integrity, compassion, and a sense of fairness independent of circumstances.*" After we have reached circumstances, integrity barely survives in our minds.

The max-three principle is an unspoken and intractable rule of public speaking. You may notice it next time you listen to a politician or pundit.

### ***A.12 Each paragraph should have a clear objective***

Concepts should be laid out sequentially or in parallel toward a common goal. Decide on a presentation or narrative plan at the outset and consistently follow the path. Conclude each paragraph with a sentence that conveys a sense of incremental understanding or accomplishment.

For example, in discussing the concept of *loyalty*, you could dedicate a paragraph to each main philosophical or sociological contributor, and then summarize primary milestones and examples in shorter paragraphs.

Do not ramble, that is, do not say the same thing over and over again in different paragraphs using different points of departure. Repetition transcends a sense of despair.

### ***A.13 Put no more than ten sentences in one paragraph***

Long paragraphs are practically unreadable. Force yourself to make a complete and compelling argument in less than ten sentences, even

when reviewing a lengthy bibliography. Few subjects is too complex to require more than ten sentences, with a few exceptions; one exception is Einstein's general theory of relativity.

Always keep in mind that you write to be read by others. The maximum number of sentences encapsulated in a paragraph is dictated by your audience, not by you.

If a cogent argument cannot be made in a few sentences, the entire presentation must be revised or rethought. Only two sentences per paragraph are allowed in non-investigative journalism.

Pause and apply the *removal test* to each sentence, passage, or paragraph: if the material is removed, does everything else make sense? Strip down everything to its essential elements.

### ***A.14 Pay attention to proper capitalization***

Use *Internet* when you refer to the worldwide web, *internet* when you refer to a generic network. For example, you may say that the company's internet is a gateway to the Internet. You may complain that the internet in your log cabin is slow.

Use *Introduction* and *Conclusions* to refer to the introduction and conclusions section of a paper. However, you may state: "*much to everyone's astonishment, in his introduction to the ceremony, the Provost enumerated his accomplishments instead of those of the honorees*" (unbelievable but true story.)

Pay attention to semesters and seasons. Write *the students will return in the Fall semester* and *the students will return in the fall*. A poor reputation as a writer is hard to repair.

### ***A.15 Use technical terms and abbreviations with caution***

You must surely know that *app* is an abbreviation of *application*, which

describes *compiled binary or interpreted computer language code*. If you are unaware of the origin of the abbreviation *app*, do not use it. Most smart-phone and tablet users and some sales associates are under the impression that *app* stands for “*appliance*.”

### ***A.16 When writing an Abstract, use passive voice as much as possible but not exclusively***

The Abstract must state concisely and clearly *what, how, and where*, and then summarize the main findings. Do not start the Abstract with the sentence “*We consider ...*” or “*In this paper we study ...*”. Do not repeat the title of your paper in the first sentence of the abstract.

Pack as much information as possible in each sentence. Instead of writing “*we consider the folding of a circular layer of dough into a canoli*,” write “*the folding of a circular layer of dough into a canoli is studied by analytical, computational, and laboratory methods*.”

### ***A.17 Do not start the Introduction with “In this paper, we consider ...”***

The unnecessary prelude “*In this paper*” is redundant and inconsequential. It can be omitted without affecting the meaning or intent of the rest of the sentence.

However, in order to make a clear distinction between previous and present work, you may write in the Introduction after you have reviewed and discussed the work of others: “*In previous work, the imbibition of water into a paper towel was discussed. In this paper, the imbibition of red wine is considered*.”

Do not write “*in the current paper*” when you mean “*in the present paper*” or, better yet, “*in this paper*.” *Current* has a sense of time, *present* has a sense of space.

### ***A.18 Do not start the last paragraph of the Introduction with “The paper is structured as follows.”***

Firstly, a colon (:) instead of a period (.) should have been used after “follows.” Secondly, even if the colon were used, what follows should have consisted of multiple sentences separated by semicolons (;). Thirdly, the phrase “*The paper is structured as follows*” is an awkward substitute of a table of contents.

The proliferated usage of “*The paper is structured as follows*” in technical writing can only be attributed to mindless repetition in the era of cut-and-paste. You may be influenced, but should not copy anybody else’s style, including your favorite professor’s or author’s.

A reasonable last paragraph of the Introduction may read as follows:

*“In Section 2, the equations governing the flow of a suspension of deformable particles are derived. In Section 3, the governing equations are specialized to the case of red blood cells. Numerical methods for solving the governing equations are presented in Section 4 and results are discussed in Section 5. The main findings and their implications are discussed in Section 6.”*

### ***A.19 Follow the subject–verb–object structure, put important explanations and reasoning at the beginning***

You may write: “*Because the speed of light cannot be attained, life forms are restricted to a finite span; consequently the elixir of life remains elusive.*” You may write: “*Being a compact operator, the definite integral projects the space of all regular functions onto the space of continuous functions.*” You may write: “*Having outlined the governing equations, we proceed to develop numerical methods.*”

Be aware that the prelude "*Having said that, . . .*" evokes anxiety and discomfort. For example, a medical doctor may disclose her diagnosis by telling a patient "*Many forms of hypochondria are curable. Having said that, . . .*"

### ***A.20 Parallel structure is appealing in spite of the repetition***

Parallel structure expresses coordinate ideas. For example, you may say: "*I will pay ten dollars for an ice cream cone, and my brother will pay five dollars for a canoli.*"

Inferior statements are "*I will pay ten dollars for an ice cream cone, and my brother five for a canoli,*" and "*My brother and I will pay five or ten dollars for a canoli or a cone of ice cream, respectively.*" The last sentence is truly ridiculous.

If more than two items are involved in an enumeration, the repetition can be annoying, unless significant new information is offered in each item. Seemingly endless repetitions are used as mental submission tools by shrewd preachers, politicians, pundits, and talk-show hosts.

A brilliant parallel structure can be found in Christ's speech on the mountain (Beatitudes): "*... Blessed are the meek...*". The word *meek* is an unfortunate translation of the Greek word *πραος*, which is the antonym of *aggressive*. Passive-aggressive people inflict a great deal of harm.

### ***A.21 Like legalese, technical writing should be purposeful and immune to misinterpretation***

Write direct and unambiguous statements that convey a sense of confidence and are defensible to the *iota*. Do not make exaggerated statements in the absence of plausible explanations or compelling justifications.

Instead of writing “*the equation takes the simplified form  $ab = c$ ,*” write “*the equation simplifies to  $ab = c$ .*” The second form conveys a sense of certitude.

Instead of writing “*consider a periodic flow cell, as illustrated in Figure 1,*” write “*a periodic flow cell is illustrated in Figure 1.*” The second form conveys a sense of purpose.

Which one of the following two sentences do you prefer? “*Figure 1 presents results for the baking time to illustrate the effect of olive oil*” or “*To illustrate the effect of the olive oil, measurements of the baking time are presented in Figure 1.*”

## ***A.22 Latin elements add a touch of class***

Latin elements include *a fortiori*, *a priori*, *a posteriori*, *ab initio*, *ad hoc*, *ad hominem*, *ad infinitum*, *alter ego*, *de facto*, my favorite *ipso facto*. Fully understand the meaning of a Latin element before using it, otherwise you risk losing credibility. Test: What is the meaning of *interlocutor*?

## ***A.23 Keep in mind and use the “either or” and “neither nor” structures***

Schroedinger’s cat was neither here nor there (*reductio ad absurdum*.) Making a fortune in the stock market in light of pervasive poverty is neither ethical nor gratifying. Publicizing your own work guarantees neither success nor respect. Accumulating fame and fortune makes you neither smart nor handsome. Seeking and accumulating honors and awards makes you neither special nor noteworthy.

## ***A.24 Omit the period at the end of enumerated items in a list***

A bullet or other symbol preceding an item is a sufficient substitute of the period at the end of the previous item. For example, write:

- Pull out the choke lever
- Fully depress the priming bulb four times
- Pull the starter cord three times
- Push in the choke lever
- Pull the starter cord again to start the engine

### ***A.25 Do not use technical words, concepts, or terms that you cannot properly explain or describe***

There is no such thing as *surface tension coefficient*. The correct term, *surface tension*, is force over length; in contrast, stress is force over area.

In science and engineering, all physical variables has precise units. The arguments of the logarithmic, exponential, error, Bessel, and other such functions must be dimensionless. Mathematicians, but not engineers, deal exclusively with dimensionless variables and functions by default due to their abstract upbringing.

A professor once participated in an ad-hoc committee charged with the appointment of an administrator for faculty development. After some discussion, the professor admitted that he did not understand what the job truly entailed. The professor was surprised to hear that his colleagues had similar difficulties that were reluctant and embarrassed to articulate.

Do not discuss things, concepts, and ideas that you do not fully understand.

### ***A.26 Avoid hyperbole***

The frequent statement "*Professor A. V. Erage is beyond excellent*" is meaningless. The state of excellence is an upper bound not to be exceeded by any human being under any conditions, except under the auspices of the paranormal.



Hyperbole negates, diminishes, and cheapens the quality of the person or object that is meant to extoll. When someone or something is described in superlative terms, everyone senses some degree of deception.

Hyperbole can be positive or negative; the latter can be unusually cruel. An example of a cruel hyperbole is: "*Dr. U. N. C. Orrupted has the credentials to be a post-doc, but is certainly not qualified to be a tenured Associate Professor.*"

The traditional evaluation scale used to contain in its ranks the steps: *excellent, very good, good, fair, unsatisfactory*. The contemporary evaluation scale contains in its ranks the steps: *amazing, unsurpassed, exceptional, excellent, extraordinary*. Always mean what you say and say that you mean.

Some colleges require that student evaluations of each faculty member are above average (true.) Any reasonable person will agree that this is possible only at Garrison Keillor's Lake Wobegon Community College (LWCC).

### ***A.27 Split your work into different papers only when absolutely necessary***

You reputation and contributions to science will be much enhanced if you write one comprehensive paper rather than five flimsy papers with overlapping sections. Resist the temptation of listing the very same article, paper, or book in an annual report about a dozen times: in preparation, submitted, in revision, revised, to be accepted, withdrawn, accepted, in press, to appear, about to be published.

### ***A.28 Do not write while climbing on a learning curve***

You cannot explain to others things that you are in the process of learning. However, you should keep notes for the purpose of identifying missing links, unclear points, and topics for further research.

When writing, imagine that you are explaining concepts to a layman who is willing to listen and learn. Your points should be brief, clear, and compelling. Do not waste the layman's time.

Take time to study and understand the necessary underlying concepts and notions. Learn by putting pieces together, making analogies, and realizing similarities.

Review what you have learned during the day when you go to bed at night, when you wake up in the middle of the night, or when something keeps you awake at night. Be concerned if you did not learn anything during the day, including weekends and holidays.

### ***A.29 Make precise references***

Instead of writing *"as explained before, donkeys and goats are delightful,"* write *"in §3.5, we saw that donkeys and goats are delightful creatures capable of exhibiting a great deal of affection."*

Do not make broad citations such as: *"by studying the New Testament, we learn that it is easier for a camel to pass through the eye of a needle than for a rich person to be admitted to Heaven."* Cite specific chapter numbers, section numbers, equation numbers, or page numbers.

Cite everything that needs to be cited and attributed to someone else. Unconscious plagiarism is understandable and unavoidable; conscious plagiarism is a sin.

### ***A.30 Do not write "The above equation"***

When your manuscript appears in print, the equations may no longer be above. If a derivation is based on many previous equations, write *"Combining the preceding equations, we find that the entire derivation is flawed and the analysis serves no useful purpose."*

Similarly, write: *"The arguments outlined in Section 2 indicate that the human race has escaped cyclical development in the neighborhood of a limit cycle and follows a spiral path characterized by the absence of physical presence."* This sentence is an example of an absurdity presented as a piece of philosophy.

### ***A.31 Use proper grammatical structures***

What is the difference, if any, between: *"I might have said it"* and *"I may have said it"*? What is the difference, if any, between: *"This is not natural"* and *"This is unnatural"*? When in doubt, consult an English writing website or a person who is proficient in history, English writing, philosophy, or linguistics. It is best to learn by example.

### ***A.32 Do not start a sentence with "And" or "But"***

A sentence that begins with *"And"* or *"But"* invariably becomes locus poenitentiae. If you must begin a sentence with *"And"* or *"But"*, precede it with the semicolon (;). *"And"* and *"But"* can be used in unstructured narration, free-form prose, poetry, and only by experienced and skillful authors.

Some things should be said or written only by recognized authorities, spokespersons, or gifted communicators.

### ***A.33 Put the "however" at the beginning***

The purpose of *however* is to warn that something irreverent or anti-theatrical is forthcoming. For example, you may write: *"However, the tenderness of the night had softened her sadness."* Contrast this with: *"The tenderness of the night, however, had softened her sadness."*

Exception is granted when emphasis is placed on a person, action, feature, or object. For example, we may say: *"You, however, are a brilliant fashion designer."*

### ***A.34 Always define acronyms, twice if necessary***

For example, you may write: "*The fast Fourier transport (FFT) was invented in 1974.*" Note the capitalization.

Do not redefine established acronyms. For example, do not redefine pdf (portable document format) to mean probable distance from a funnel. Do not redefine FFT to mean finite Fourier transform, which is really the Fourier series.

However, you may redefine portable document format (pdf) to mean probability density function; as a matter of historical justice, the latter preceded the former.

Invent new acronyms with caution. If you must, you may want to repeat their definition several times in the text, especially in the Introduction.

### ***A.35 Avoid idle and pretentious words***

Pretentious words include "*wherein, thereof, leverage, transpires, indeed*", and others. Would you ask your grandfather to leverage his furniture making ability? Avoid words that are not used in everyday conversation.

Do not write to impress. Impress with your good nature, intelligence, character, broad knowledge, and skills. Work every day to improve your good nature, intelligence, character, broad knowledge, and skills.

### ***A.36 Pay attention to hyphenated words***

Observe the evolutions: *lap top* → *lap-top* → *laptop* and *straight forward* → *straight-forward* → *straightforward*. The hyphen disappears as a linked pair of words matures. Write "*nonlinear*" instead of "*non-linear*," "*centerline*" instead of "*center-line*," "*everyday*" instead of "*every-day*."

Has “Web site” matured into “website”? The answer is affirmative. Make a judgment call for the maturity level of your word pairs.

### ***A.37 Avoid abstract nouns***

A noun is abstract when it describes something that cannot be detected by one of our five senses. For example, redemption cannot be seen, heard, smelt, tasted, or touched.

One can easily impress by using abstract nouns. However, although impressive at first, abstract nouns carry a sense of cheapness, demagoguery, and emotional manipulation, not unlike a movie that evokes emotion by portraying someone’s misfortunes or death (note and avoid the annoying use of a double negative.) By contrast, smile and laughter are much harder to extract.

Abstract nouns have a place in everyday conversation but should be avoided in scientific and technical writing. The rejection of abstract nouns in poetry has been discussed extensively in the literary literature. Following is the beginning of a brilliant poem by Robert Frost:

#### ***The Road not Taken***

*Two roads diverged in a yellow wood,  
And sorry I could not travel both  
And be one traveler, long I stood  
And looked down one as far as I could  
To where it bent in the undergrowth;*

*Then took the other, as just as fair,  
And having perhaps the better claim  
Because it was grassy and wanted wear,  
Though as for that the passing there  
Had worn them really about the same,  
...*

Not a single abstract noun is used in this brilliant poem.

### ***A.38 Pack every sentence with new information***

The statement “*assessing the effect of mustard on the structural integrity of a hot dog requires further elaboration*” is vacuous. The reason is that half of this sentence is devoid of new information. You can write instead: “*linear stability analysis or laboratory testing must be conducted to assess the effect of mustard on the structural integrity of a hot dog in munching.*”

Pack sentences with new information, not by making them longer, but by making them more substantive. Remember that the content of a website is more important than its decorative form.

### ***A.39 The Introduction should have no or few equations***

The subject should be introduced from a chosen perspective: *practical, historical, intellectual, physical, mathematical, or forensically*. Choose your approach at the outset.

As an example, consider the problem of heat transport from a burning particle into an ambient gas. You may introduce the topic historically, in terms of its importance in engineering applications, or you may simply state the problem in physical and mathematical terms in the absence of a preamble. If the last venue is chosen, importance and applications should be proved after objective functions, such as rate of transport, have been defined.

### ***A.40 Build interest in the Introduction***

Talented writers reveal only as much information as necessary at the moment, offering suggestive clues to build the audience's interest and anticipation for what follows. Build your Introduction following this paradigm. Guide the reader through the mental steps you have followed to develop or carry out your theory, physical work, or communicated narrative. Describe successful and unsuccessful attempts.

### ***A.41 Do not use meaningless sentences and cliches***

Avoid making generic statements, such as “*The [something] finds numerous natural, engineering, and biophysical applications [stack of references].*” Prove this instead by example in a few sentences. If you cannot find examples, the statement is misleading or inaccurate and should not be made.

Write “*indirectly*” instead of “*in an indirect fashion*.” Do not use annoying preludes such as “*At the end of the day,*” “*To this end,*” or “*On the other hand.*”

### ***A.42 Use interludes***

An interlude is a knob on a door that leads us to a new room. The following paragraph is an interlude:

*We have seen that authenticity is an admirable quality shared by outstanding artists and scientists. Next, we discuss the specific qualities of an authentic person, beginning with aversion to public appearances and interviews, and the decline of meaningless and marginally meaningful honors and awards.*

Use interludes extensively in written or verbal communication, including lectures and seminars.

### ***A.43 “Hands down” is an adorable colloquialism***

Wikipedia explains that: “*The origin of this colloquialism seems to have its roots in mid-19th century horse racing. When a horse jockey is nearing the finish line far ahead of the competition, “with victory certain”, he could drop his hands, relaxing his hold on the reins, and still win the race. By the late 19th century the phrase was being used in non-racing contexts to mean “with no trouble at all.”*”

You may say, but do not write in a paper or book: “*I prevented numerical instability by injecting artificial hyperdiffusivity, hands down.*”

You may say that: *"the accuracy of the boundary-element method is superior to that of the finite-element method, hands down."*

If a person in the audience asks you for the meaning of *hands down* or *grain of salt*, be prepared to provide a factual answer. If a person in the audience asks you for the meaning of life, tell them that the meaning lies inside of you. The only Zen that you will find on a mountain is the Zen that you bring with you.

#### ***A.44 Refuse coercive and gratuitous citations***

Wilhite and Fong (*Coercive Citation in Academic Publishing*," Science, 335, February 2012, pp. 542–543) explain that:

*"Coercive self-citation refers to requests that (i) give no indication that the manuscript was lacking in attribution; (ii) make no suggestion as to specific articles, authors, or a body of work requiring review; and (iii) only guide authors to add citations from the editor's journal."*

Resist making coercive citations or self-citations requested by aggressive journal editors.

Under no circumstances make *gratuitous* citations in the form of marginally relevant references to articles published in high-impact journals. The purpose of a gratuitous citation is to fraudulently validate one's work by association.

#### ***A.45 Minimize and carefully select your references***

A stack of references in the middle of a sentence or following a sentence serves no purpose at all. Imagine how much space it would take if you wrote inside parentheses all authors' names and publication years, as some journals that value the individual investigators require. Cite only what was necessary and helpful to develop your work. Using only a few dated references may convey the impression of arrogance, which is a chance that you may want to take.



Do not cite irrelevant work by potential reviewers for the purpose of flattery or else to elicit a favorable predisposition. The list of references should not resemble the list of publications in your resumé.

### ***A.46 Do not rely on spell-checkers***

Ask others to correct your grammatical or pronunciation errors. Offer 10 cents for each correction (free money can add up to a free lunch.) When in doubt, check and investigate every spoken or written word:

- Do not write “*insure*” when you mean “*ensure*”
- Do not write “*affect*” when you mean “*effect*”
- Do not write “*it’s*” when you mean “*its*”
- Do not write “*ocean’s*” when you mean “*oceans*”
- Do not write “*complimentary*” when you mean “*complementary*”
- Do not write “*respectful*” when you mean “*respective*”
- Do not write “*titled*” when you mean “*entitled*”
- “*Phenomenon*” is singular, “*phenomena*” is plural
- “*Criterion*” is singular, “*criteria*” is plural
- “*Dynamics*” is both a singular and plural noun
- “*Dynamic*” is an adjective
- Do not write “*incredulous*” when you mean “*incredible*”
- Do not write “*while*” when you mean “*whereas*”

A book is entitled (not titled) “*General Relativity for a Fainting Goat*.” A weather pattern exhibits interesting dynamics. You can say that someone is a dynamic speaker (imaging lots of gestures and facial expressions.) Stating that “*This is an interesting phenomena*” is a sign of unbearable ignorance.

### ***A.47 The Conclusion should have no or few equations***

A denouement, self-critique, general observations, unanswered questions, interesting thoughts, and proposals for further work should be discussed in the Conclusion in all honesty and without exaggeration.

It is best to use past passive voice in the Conclusion. Instead of writing "*We saw that bee honey is a non-Newtonian fluid,*" write "*We have seen that bee honey is a non-Newtonian fluid.*"

The Conclusion should be presented in narrative form. The use of an itemized enumerated list is highly suggestive that the material was borrowed from a seminar or proposal PowerPoint presentations, which is highly inappropriate.

### ***A.48 The common "more importantly" is incorrect***

The correct expression is "*more important,*" which stands for "*what is more important.*" For example, you may write:

*"More important, the independence of the speed of light on the acceleration of the frame of reference proposed by Einstein ensures that the amount of energy attributed to a certain mass, is also independent of the acceleration of the frame of reference, and vice versa. If it were not, we would be able to generate or destroy energy or mass by acceleration or deceleration, thereby violating fundamental laws of the Universe."*

### ***A.49 Do not make caustic remarks***

An example of a caustic remark is: "*the proof of the theorem presented by the authors has only tenuous relation to mathematics.*" Another caustic remark is: "*what is interesting in this paper is not new, and what is new is not interesting.*" Reading these remarks causes extreme discomfort and unsettling thoughts. Essentially the same things can be said in much less cruel, crass, and sadistic tone.

In fact, caustic remarks only reveal insecurities and bitterness on behalf of those who make them. Often, caustic remarks are symptoms of a habitually inappropriate or unpleasant behavior that can escalate to bullying.

### A.50 Avoid superlatives

Instead of writing: “*it is very important to clip your toenails,*” write “*it is important to clip your toenails,*” that is, cross out the word *very*. Use words such as *very*, *extremely*, *fantastic*, and *fabulous* either never or sparingly. The words *notable*, *noteworthy*, and *successful* are fair and honest alternatives.

Do not exaggerate, be cool and collected at all times even in a state of frustration, euphoria, or genuine despair, Keep the bigger picture in mind.

### A.51 Use verbs in active or passive voice instead of nouns

You will be surprised by how much improvement can be made by following this simple rule. Instead of writing: “*the sensitivity of the experiment to the temperature of the electrolyte was found to be pronounced,*” write “*the experiment was found to be sensitive to the temperature of the electrolyte.*”

### A.52 Define symbols at the end of a sentence

For example, you may write: “*To formalize the theory, we define the Horbiger number  $Ho = UR/Q$ , where  $U$  is the potential,  $R$  is the radius of the container, and  $Q$  is a given mass.* The second part of this sentence serves as a convenient legend.

If numerous symbols are used, you may summarize them in a Table with explanations. Use standard notation for each symbol.

### A.53 Choose your literals

In computer programming, a *literal* is a symbol or string of characters that is accepted for what it is. A literal is not a variable or an alias and may not serve as a metaphor or placeholder.

The word *literally* emphasizes that a statement is not a figure of speech but an actual event, as in the sentence “*The Dean was literally run out of office* (imagine professors, staff, and the provost running after a distressed Dean.) The statements “*Our phone lines are literally flooded*” and “*The numerical instability is literally suppressed*” are nonsensical.

Avoid using the words *literal* and *literally*. Find other more appropriate words to make your point.

### ***A.54 Choose each word carefully***

Use “*each other*” to compare two objects, “*one another*” to pairwise compare multiple objects. Use “*state of the art*” to describe factual achievements, “*state of affairs*” to describe temporal achievements.

### ***A.55 Do not nondimensionalize narration***

Some authors write: “*Let  $x^*$  be a length, and introduce the dimensionless length  $x = x^*/L$ , where  $L$  is a characteristic length scale.*” These definitions seem unnatural and the use of the asterisk (\*) is distracting.

Other authors write: “*To this end, we nondimensionalize lengths by the refrigerator height,  $L$ , and consider a container with width  $h = 0.1$ .*” This strategy is unhelpful and potentially confusing. The cliché “*To this end*” should be avoided at all cost.

Use physical variables throughout your document. For example, write: “*Consider a vehicle with width  $h = \alpha L$ , where  $L$  is the vehicle length and  $\alpha$  is a dimensionless coefficient. Analysis of sales data indicate that, for the best-selling vehicle,  $\alpha$  is the golden ratio.*”

### ***A.56 Use single dash or double dash, as appropriate***

The single dash ties together two words, where the first word qualifies the second; the order cannot be transposed.

The double dash (long dash or en dash) ties together two words that can be transposed.

For example, you may write: "*Equation (4) implements a high-order Cauchy–Born rule.*"

### ***A.57 Read good journalism and literature***

Carefully and frequently read articles, documents, and essays written by good writers, irrespective of the opinions expressed. You may disagree with the opinions but admire the style and pay attention to the language. Carry a piece of paper or a small notebook and a pencil in your pocket or pocketbook to record phrases, words, observations, experiences, and thoughts. Make a note of words and phrases that you do not understand or understand and admire.

### ***A.58 Write a few paragraphs each day***

Work on a paper, class notes, research notes, personal notes, a shopping list, a personal journal, your obituary, things that make you grateful, a hymn to your cat, or anything else you enjoy. When you write text, do not abbreviate or scribble but write grammatically correct whole words and syntactically correct sentences.

### ***A.59 Look up new words***

If you encounter a word whose meaning do not completely understand, look it up immediately or make a note of it in your notebook or on a sticky note.

*Test:* What are the meanings of the words "*pejorative*", "*apparition*", "*diffident*", "*jest*", "*sycophant*", "*prevaricator*", "*anathema*"?

***A.60 Do not write bad sentences  
thinking that you will return to fix them***

You can rarely fix a badly written paragraph or passage. You will end up rewriting the paragraph or passage, and perhaps many other paragraphs, thus wasting the initial effort. Frustrated authors are known to crumble or delete manuscript pages in frustration when they realize that the writing cannot be improved. Instead of writing a badly written paragraph or passage, make preliminary notes.

## Part B

### Yellow Leaves

*"It's not impossible that the Hummer that just cut me off is maybe being driven by a father whose little child is hurt or sick in the seat next to him, and he's trying to get this kid to the hospital, and he's in a bigger, more legitimate hurry than I am: it is actually I who am in HIS way."*

David Foster Wallace

#### ***B.1 Do not criticize other authors for mistakes they might have made, but simply state the facts***

Be kind and considerate, nothing ever published is free of errors. Do not let your review of a paper, book, or manuscript become a punitive essay. It is best not to point out other people's honest mistakes or logical gaps in front of an audience, except for the purpose of preventing an imminent embarrassment or an emerging disaster.

Deliberate mistakes and exaggerations should be pointed out in a timely yet appropriate and tactful fashion. Do not point out mispronunciations or typographical errors in public.

## ***B.2 Do not get discouraged***

Just get the manuscript out there through some reasonable and reputable venue. Give up only if a manuscript has been rejected more than five thousand times, and then think of going indie.

There is absolutely no stigma associated with vanity press and indie. Do not worry about what sanctimonious people will say. Consider paying a hundred dollars or so to have your paper published and available on the Web.

Irrational and thoughtless rejections by journal editors and others in position of authority can dispirit bright graduate students at a vulnerable stage of their career. Most reviewers and editors are not fully aware of the collateral damage they inflict on innocent bystanders. The science community establishment needs to understand that being a journal editor is not a resume or self-assertion item, but a service to the profession comparable to priesthood.

Some editorial boards and proposal review panels can be traced to academic family trees planted by influential professors. They will say that, because they are the best, their students and grand-students are the best of the best.

## ***B.3 When revising a manuscript to address reviewers' comments, make a judgment call***

Reviewers and referees may ask for additions and modifications that may seriously compromise the character, intention, and focal point of your work.

For example, one reviewer may ask for a distracting lengthy bibliographical survey, a second reviewer may ask for complementary analysis and computations, and a third reviewer may demand that an experiment be repeated in a device that travels faster than the speed of light.



Do not feel obligated to follow the advice of the reviewers, but politely explain to the editor why you have chosen not to revise. Withdraw the paper if the editor is not sympathetic and submit your work elsewhere if necessary.

### ***B.4 Hard concepts made simple***

A professor wrote an interesting paper that failed to pass the pre-screening stage of three journals. Each editor said that the paper is well written and the science is good, but there is little physics (Editor A), little mathematics (Editor B), or little interest in the subject matter from the general audience (Editor C.) In fact, the paper was rejected because it made hard concepts seem simple.

The predicament “*make hard concepts seem simple*” is consistent with the well documented resistance of the scientific (or any other) community to new concepts, methods, and ideas. The three stages of resistance are: (a) an idea or concept is wrong, (b) the idea or concept is correct but not important, (c) the idea or concept is correct and important, but it was known all along. It is much easier to publish a mediocre paper or book than a good paper or book.

### ***B.5 Be appreciative of good editors and grateful for free copy editing***

Copy editing is the process of parsing each sentence and every word of a document with the objective of improving language and presentation. The absence of copy editing is obvious in most published papers and nearly all furniture assembly instructions.

Most journal editors make binary decisions for accepting or rejecting manuscripts by pushing buttons. Few editors copy edit and show a sincere interest in improving an accepted manuscript and providing constructive advice to authors rejected manuscripts. Copy-editing a technical document is an exasperating and expensive process.

Most authors are grateful to conscientious editors for free copy-editing and appreciate their input, sometimes in the Acknowledgements section. Some authors do not realize how much they can benefit from a skilled and experienced professional or anyone else who takes the time to read their work.

Some inexperienced or egotistical authors get bent out of shape when an experienced editor or gifted writer improves their work by correcting grammatical structures and typographical errors (hard to believe but true.)

### ***B.6 Do not agree to become a coauthor in a paper with more than two other authors***

Your publications should be single-, double, or triple-authored at most. Reluctantly agree to be a coauthor in a paper with more than two other authors. Consider with suspicion and dismiss any paper in someone's resume with more than three authors. Count as negative (anti-paper) any paper with more than four authors.

Exceptions are granted to undergraduate students working in a lab, or in *rare* cases where a project requires a multitude of expertise that cannot be easily acquired. Examples are sophisticated experiments in particle physics.

If you publish papers routinely with more than three authors, ask yourself whether you have become a research manager, a paper-generating machine, or a coercive coauthor.

### ***B.7 Thicken your skin***

Book authors not only must be good writers and have something interesting to say, but also be protected by thick skin that will shield them from expert and other opinions, broadband criticism, and unhinged manifestations of professional jealousy. Assess the thickness of your skin before exposing yourself to the general public.

Like Diogenes carrying a lantern in search of an honest man, I once suggested to a journal editor that only published book authors should be allowed to review books. Little did I know that, thanks to the Internet, the reviewing business would grow to become a profitable industry capitalizing on the primitive instinct to criticize what we do not understand and diminish what lies above us.

Thoughtless reviews can be especially detrimental to small-business owners, physicians, and dentists.

### ***B.8 Do not criticize a prolific author (with less than three authors in each paper)***

Admire instead that they are energetic, imaginative, hard-working, and creative researchers and writers. Novelist Stephen King is a notable example of a brilliant and prolific author. Did you know that he wrote the story of *The Shawshank Redemption*, a wonderful and inspiring tale of hope?

It is the duty of journal reviewers, editors, and publishers to screen out work that is not sufficiently novel or interesting to be worthy of publication. Some things inevitably fall through the cracks.

### ***B.9 Do not criticize a non-prolific author***

Investing weeks, months, or years into learning, thinking, and deducing with an uncertain outcome, and then writing a seminal paper or book that will take time to be understood and appreciated by others requires considerable resolve and determination.

Arguably the most influential researcher in fluid mechanics, Professor G. K. Batchelor wrote 85 brilliant papers and two seminal books. This publication record would be rated low by today's standards, hardly supporting a case for promotion to Professor in a second-tier Institution, let alone promotion to a chaired or Distinguished Professor.

In the modern era of smokes, mirrors, and fake news, it is doubtful that many brilliant scientists would have been awarded tenure in a third-tier institution.

Professor Batchelor's work was cited over 10,000 times up to the year 2013. It appears that this count is an upper limit for legitimate citations of any researcher in fluid mechanics. Influential researchers in other fields have different standards and may set different upper limits.

### ***B.10 Do not accept honorary and coercive coauthors***

Greenland and Dingman (*"Ending Honorary Authorship," Science*, 337, August 2012, p. 1019) write:

*"A true author is someone who has made substantive intellectual contributions to a study and is responsible for a component of the work. Honorary authorship violates this central principle."*

A coauthor is honorary when added for the purpose of extracting an understood or implied favor. Some institutions provide rules and guidelines regarding honorary authorship in an effort to prevent bullying and abuse from powerful faculty.

### ***B.11 Do not underestimate the huge amount of effort and commitment it takes to write a book***

Professor G. K. Batchelor explained this in a wonderful essay entitled *Research as a Lifestyle*. Writing a book, even a science or technical book, is a unique experience that cannot be explained. Most authors never finish their books, they just abandon them and publish them when they are about to suffer a mental breakdown.

### ***B.12 Deliberate plagiarism is a sin***

Enough said.

### ***B.13 Do not set as an objective the writing of a paper***

Preoccupy yourself with learning, discovering, and documenting answers to interesting questions and problems. Consider a paper a natural venue for communicating novel ideas, new findings, and interesting thoughts.

A graduate student became distressed when an interesting project ended up as an ill-posed problem after two years of intense effort. A wise professor reminded her that they he had learnt a great deal along the way. In fact, the student benefitted a great deal from the initial failure.

### ***B.14 You are allowed to write research papers that are not earth shattering***

Although a research paper or essay should be interesting in some ways, not all papers or essays must be milestones. Most papers make incremental contributions toward a well-defined goal. When a field of study matures, someone puts the pieces together and the community moves on.

### ***B.15 Do not cut and paste***

Enough said.

### ***B.16 Read carefully all sources that you cite***

Do not rely on what others have written to describe the literature. Half the time, the citations will be inaccurate, incomplete, or marginally relevant (fake news.) Make sure that you give credit where credit is

due. You may have read that “*tubes with helical corrugations are used in industry to promote mixing and enhance rates of transport.*” This statement could be strictly true, but the technology may have become obsolete in the 1940s.

***B.17 Do not pretend that you have discovered something that has already been discovered***

If you discover that your work duplicates someone else's published work, reign your frustration, abandon your paper, and revise your research plan. Do not pretend that you are unaware of the other person's work. Consider publishing a brief note in another relevant future paper to let others know that you have duplicated and validated the previous work.

***B.18 When reviewing someone else's paper, do not recommend rejection (unless you need to push a button)***

If you think that a paper is not sufficiently good for publication, state the reasons and conclude that the minimum standards for acceptance have not been met. If you are a senior author, assist deserving younger authors in their endeavors.

***B.19 The most important decision to be made is what problem to solve or what line of research to pursue***

Identifying a specific problem to solve or a specific research area to pursue is much harder than solving the problem or carrying out the research. The operative adjective in this statement is *specific*. You cannot one day decide that you will solve the energy problem, cure cancer, eliminate varicose veins, and invent a waterless washing machine.

Spend much more time reading, learning, and identifying tractable research problems than solving these problems. The operative adjective in this statement is *tractable*. You must have an idea of what specific tasks need to be undertaken and what specific conceptual blocks need to be overcome. Do not simply duplicate someone else's research program, including your adviser's.

### ***B.20 Know when you strike gold***

If after numerous attempts you still cannot find good answers and satisfactory explanations to a specific issue or problem of interest, the subject has not been understood sufficiently to be explained well by others. Consider yourself lucky and take leadership in reframing or describing the problem for the benefit of the scientific community. Consider working on notes, a review paper, or a book manuscript.

### ***B.21 Interdisciplinary endeavors can be ridiculous***

Do not combine diverse expertise into ridiculous projects for the purpose of keeping busy, scamming funding agencies, getting by, or getting rich. You may know how to prepare sushi and you may have learned how to milk a cow. Do not propose preparing sushi while milking a cow.

### ***B.22 Look for good ideas***

In developing your work or research projects, and in evaluating, if you must, someone else's work or research projects, look for good ideas. Mundane and busy work that lacks novelty may serve a purpose but will not cross the significance or publication threshold.

As a graduate student, look for an adviser with a good and consistent record of good and novel ideas. Do not sign up to work with a hands-off adviser who spends most of his/her time traveling to conferences and googling research projects. Learn how to recognize and dismiss derivative ideas.

### ***B.23 Move on every few years***

As a rule of thumb, a professor or graduate adviser should move onto a new research area every five years, gradually moving away from previous research areas. Exceptions are granted in cases of exceptional projects that require a lifetime of commitment. An example is developing the boundary-element method from scratch or counting the number of stars in the Milky Way.

### ***B.24 Weigh facts more than promise***

Young faculty are given grants and awards based on promise in response to proposals and invitations where they, the Department Head, the Dean, and others assure granting agencies and private institutions that the faculty will deliver a key to a better world. Unfortunately, the lock seems to be re-keyed each year. In the absence of accountability, grants based on promise may continue until a professor retires.

### ***B.25 Learn how to typeset documents in Latex***

*Latex* is a widely available professional typesetting programming language that places priority to content over presentation and form.

To write a document in latex, a user prepares a file containing text and formatting instructions using a text editor, such as *vi* or *g-edit*. The document is then compiled (processed) by the latex app to generate a device-independent (dvi) file. The dvi file can be subsequently converted into a postscript or pdf file. Although this sounds complicated, it is actually very simple. Free latex compilers are available for any operating system.

Latex allows you to concentrate on the substance of writing and worry about presentation by adding formatting instructions at the end. In its bare bones implementation, a latex document contains only three lines of formatting instructions. When printed, the quality of a latex document is superior by far to that of any other word processor.



Learn and use Latex. Use latex slides instead of PowerPoint presentations. Your writing skills and mental faculties will considerably improve. You will accept and enjoy subconsciously the notion of delayed gratification.

### ***B.26 Do not make extravagant statements***

Archaeology is not archaic and classical mechanics is not obsolete. Computers were not invented for online shopping or for implementing the Internet.

In some academic circles, humanities are appreciated more than science and engineering and *vice versa*. Do not subscribe to either point of view, but realize it is equally difficult to theorize on the origin of species and to prove the existence of solitons for the sine-Gordon equation.

There is no double that great philosophers would have made great scientists, regarded as natural philosophers, and great scientists would have made great philosophers (PhDs). Natural and traditional philosophy share methods and values.

### ***B.27 A professor can have a profound impact on someone's life***

A brilliant professor of Philosophy was invited to deliver a lecture to a class of enlisted medical doctors, entitled the "*Philosophical interpretation of death and methods of coping with the loss of young life*." The audience learned that philosophy can offer useful insights and practical advice on intractable subjects.

After taking the course, several students enrolled in a graduate program of philosophy. After completing two tours of duty, the students became veteran counselors specializing in dealing with mental trauma and post-traumatic stress disorder (PTSD).

### ***B.28 Allow for the possibility that you may not be as smart as you think***

Almost everyone in the entertainment business, performing arts, and academe thinks he/she is smarter, more creative, funnier, wiser, more charming, or more whimsical than he/she really is. With regard to feeling smart, recalibrate yourself by asking whether you can describe the mechanism by which the car's front wheels turn. Contemplate whether you could have possibly written the screenplay of the movie *2001: A Space Odyssey* or *Jacob's Ladder*.

Do not assume that professors, researchers, and others in second- and third-tier universities are not as smart as those in first-tier universities. By choice or personal circumstances, many brilliant scientists have found academic homes in institutions that are not well-known over the globe.

### ***B.29 Do not become a novelist***

If you are an engineer or scientist, resist the temptation of becoming a novelist, unless you are notably gifted. Novels by most scientists-turned-novelists read like research papers with an Introduction, Methods, Discussion, and Conclusions arranged in chapters.

If you decide to become a novelist, resist the temptation of making your students, colleagues, or staff members characters in your stories (they will know.)

If you are a novelist, do not become a popular scientist, except for the purpose of science fiction.

### ***B.30 It is unlikely that you have invented an earth-shattering concept or a truly novel idea***

Billions of smart people through the ages have contemplated and discussed issues, notions, and ideas similar to the ones you are studying.

Do not pretend that you have made an earth-shattering discovery and do not oversell your work. You should be thrilled if you have managed to reframe.

Reframing, also known as *thinking outside the box*, describes the mental process of bypassing an issue and tackling or proposing instead a more appropriate encompassing issue.

Reframing can be detected in most significant works in the arts and sciences: from Einstein's theory of relativity, to the impressionist's focus on immediate visual input. It is interesting that the protocol of downloading pictures from the Internet follows the impressionistic approach in that a coarse depiction is first downloaded and displayed, and the details are then filled in.

The boundary-element method can be reframed in the context of integral equations, which can be reframed in the context of inverse problems, which can be reframed in the context of predictability.

The Heinz dilemma illustrates the effectiveness of reframing. A brilliant trial lawyer will argue that Heinz's decision should not be a focal point. Instead, the social environment that defines the prevailing ethics and moral rules, and thereby raises the question of innocence or guilt, should be under prosecution.

### ***B.31 Overcome functional fixedness***

Reframing requires overcoming the insidious cognitive bias of *functional fixedness* underlying the brilliant *Zen and the Art of Motorcycle Maintenance*.

A person who displays this bias will not think of using his car radio to listen to the news in case of power outage or cut a plastic pipe by zig-sawing it with a plain string.

***B.32 Allow for the possibility that you may not be as important as you think***

Do not take yourself too seriously and do not self-aggrandize. Your work is not necessarily more important than that of a tradesperson or laborer. Following is a list of traditional trades borrowed from Wikipedia:

Appliance Service Technician, Artisan,  
Baker, Barber or Hairstylist, Barista, Bartender, Boilermaker,  
Blacksmith, Blaster, Brewer, Bricklayer, Butcher,  
Cabinet maker, Cable joiner, Carpenter, Carpet layer, Cleaner,  
Cement mason, Cheesemaker, Chef, Chimney sweep, Cobbler,  
Clockmaker, Construction worker, Cooper (profession),  
Electrician, Gaffer, Glazier, Gardener, Gunsmith,  
Haberdasher, Handyman, Heavy equipment operator,  
HVAC and refrigeration mechanic,  
Ironworker, Instrument Mechanic,  
Janitor, Jeweler, Journeyman,  
Knife sharpener,  
Landscape, Laborer, Lineworker, Locksmith, Lumberjack,  
Longshoreman/longshorewoman,  
Machinist, Mechanic, Metalsmith, Milkman,  
Miller, Millwright,  
Painter and decorator, Pastry chef, Piano tuner,  
Pipefitter, Plasterer, Plumber, Printer,  
Roofer, Repairman,  
Sawfiler, Solderer, Steeplejack, Steelworker, Stonemason,  
Tiler, Tailor, Theatrical technician,  
Tinsmith, Tool and Die Maker,  
Traditional trades,  
Watchmaker, Welder, Window cleaner, Wood cutter,

Read this list carefully and ask yourself if you could make edible goat cheese, install drywall that will stay on a ceiling for more than a few hours, or drive a taxi cab through New York City.

Some of the methods used by tradesmen in their work are similar to those used in scientific research, especially those pertaining to diagnosis, discovery, and repair.

Through decades of hands-on experience, carpenters have learned that if they drill holes through green lumber beams and posts, the beams or posts will not twist during drying. A marginally ethical professor will learn of this practice from a framer he hired to remodel his fourth bathroom, secretly perform a finite-element analysis of the drying process using a canned code that he licensed with his grants, and then advertise the results as a breakthrough in construction technology through Press releases and in grant applications.

Recognize that the human race is on an advancing path thanks to the hard work of unknown women and men and the insights and discoveries of those who have been endowed with special talents and skills. You can contribute by developing honest skills.

### ***B.33 Keep developing your skills***

A good percentage of university professors are experts in writing successful grant proposals but have lost most of their natural or acquired skills. Most professors of computational science have not written code in decades. Most professors who direct laboratories have not lifted a hot-wire anemometer or a micropipette in decades. The dissonance is analogous to that of a driving-school instructor who always rides in Uber or taxi cabs.

If you are a computational scientist, allocate time each day to learn new computer languages and write code. If you are an experimentalist, spend time in the lab working along with your students a few hours each week. As a junior or senior professor, make sure that you do not stop developing your skills and keep acquiring new skills. Take an inventory of your skills at the end of each semester and then again every new-year's eve.

Encourage others to keep developing their skills and acquiring new skills. The everyday person can pursue new hobbies – garden in the spring and summer, learn Italian or basket-weaving in the fall and winter – join a Unix group, or take classes at local colleges and community centers. Volunteer to teach classes in community centers.

### ***B.34 Thinking is harder than you think***

Thinking, contemplating, and deducing is a hard way to spend one's life. You can test whether you are a thinker by assessing whether you get easily bored: if you get easily bored, you are not a thinker. If you cannot fill your spare time with learning activities and mental exercises, you are not a thinker.

The inability to think is sometimes masked by the urge to do as a poor substitute. In fact, the world is not divided into thinkers and doers; the world is divided into thinkers and non-thinkers, or into doers and no-doers, with no noticeable correlation for overlap. A stigma or sense of inferiority should not be attached to non-thinkers. Many thinkers often wish they were non-thinkers.

If you are averse to thinking, you should not become a professor. If you already are a professor, consider early retirement but resist the temptation of becoming a university administrator. If you already are a university administrator, minimize the impact of thoughtless actions.

### ***B.35 Do not hire others to do your thinking***

Do not let family members, students, seminar speakers, researchers that you hire to run your lab, or random people that you meet in a store or coffee shop do your thinking. Professors and researchers get paid to think, just like others get paid to build bridges, provide sanitary services, or deliver packages.

Academic research group retreats and brain-storming sessions at tax-payer's expense contradict the very essence of the intelligent scholar.

These practices are a poor substitute of the intelligent discourse that must take place between scholars and their advisees.

You will be surprised by how hard it is to fall back into the habit of thinking after you have fallen out of it for a while, as it happens after an extended summer vacation. Once you abandon the unconscious practice of thinking for a few months, you regress to an alienating mind frame.

### ***B.36 Give yourself enough downtime***

Brilliant mathematicians hibernate for long periods of superficial inactivity invested into thinking and contemplating. Do not feel obliged to join others in the publishing rat race. Your productivity is not a linear function of time you spend at the office. Epiphanies and good ideas cannot be forced.

### ***B.37 Do not confuse activity with accomplishment***

You cannot write more than a few legitimate research papers each year. Your name cannot be attached to more than a few research papers consistently each year.

Notable musicians release records once in a while after sufficient periods of quiet time invested in creative development. Follow their paradigm.

Realize that writing a review article is an activity, not an accomplishment, best suited for a student independent study or special project. With the advent of Internet search engines, a review article serves little purpose; an exception is a critical essay.

Making an observation, such as “*if you drive over a nail you will get a flat tire,*” is not an accomplishment. Stating that “*if you walk fast while holding a cup of coffee, some will spill*” is not an accomplishment.

### ***B.38 Presenting a seminar or giving a lecture is not a performing art***

Read a tutorial on how to prepare and make a presentation. Use latex slides instead of PowerPoint pages. Determine carefully the amount of information presented in each slide. Consider the following guidelines:

- Do not substitute form for substance
- Do not yank the audience's chain by asking questions
- Do not try to flatter or please
- Do not try to displease
- Do not tell forced or pre-planned jokes
- Do not try to prove how smart you are
- Do not dress to impress
- Do not pretend that you are someone you are not
- Do not relate personal stories, especially stories involving family members

Keep in mind that every time you give a seminar you are considered for a faculty or some other current or future position by your hosts. You should come across as genuine, sincere, talented, and authentic.

### ***B.39 Be a minimalist***

Say or write only what is absolutely necessary without compromising clarity, meaning, and style.

Roger Ebert wrote that "*the genius is not in how much Stanley Kubrick does in 2001: A Space Odyssey but in how little.*" Like excessive furniture, embellishment diffuses and confuses a focal point. The more brilliant and compelling the ideas and their writing, the shorter the manuscript.

The practice of minimalism is particularly important when making seminar presentations where items projected on the screen serve to illustrate main ideas or logical steps.



Here is a set of presentation slides:

Einstein's special theory of relativity (1905)

Square of distance in everyday space:  $x^2 + y^2 + z^2$

Time,  $t$ , is involved in the space-time domain

To covert time to length, we use the speed of light,  $c$

Square of distance in space-time domain:  $x^2 + y^2 + z^2 - c^2t^2$

The minus sign is the sign of a genius

A event described in two space-time domains occurs at the same space-time distance from the origin.

### ***B.40 Ask direct and polite questions after a seminar***

Do not precede a question with a compliment; the speaker will be embarrassed and the audience will cringe. Paying compliments should be done genuinely, privately, and frugally. Compliments are not currency for quid pro quo deals.

Do not precede a question with "*I am sure you have been asked this question before.*" This prelude indicates a passive aggressive pre-disposition, as explained in §56 on being passive aggressive.

### ***B.41 Do not insult a seminar speaker***

If you do not like the opinions of expressed in a seminar, restrain yourself and remain polite and quiet. If a speaker insults you or the audience in some way, swallow your pride, walk away and turn the other cheek. Do not join the speaker for lunch and skip dinner. Let the speaker take a cab to the airport and never speak to them again.

### ***B.42 A research grant is a link in a logical chain***

Professors, researchers, and educators apply for grants that are necessary for them to develop their ideas and pursue their interests: purchase equipment, support students, procure supplies, pay themselves summer salary. There are two types of professors, researchers, and educators.

*Type A:* You have an original idea or two, you need financial support, you write a grant proposal or two, you do the work, you publish the findings. Once this is done, you repeat the cycle with some reasonable overlap. If your idea does not need financial support or if you do not plan to work in the summer, you skip the whole exercise.

*Type B:* Grants are available (you become aware by getting on a list or by incessantly searching the Internet at the coffee shop while looking for a new car to buy); you learn a bit about the subject areas by googling them or by having a post-doc, a graduate student, or an undergraduate student do it; you write grant proposals. Over the years, you have become an expert in writing fraudulent grant proposals.

Type B is viable only in the absence of scrutiny and accountability. The general strategy is that, if you throw mud at a wall, some will stick (exact quote from a used-car salesman.) Decide for yourself if would you like to be Type A or Type B and follow your conscience and instincts.

### ***B.43 A professor is not a celebrity***

Being somewhat eccentric is fine so long as the act is non-deliberate and authentic. Students observe that some professors always wear the same clothes; the reason can be that they have not gone shopping in decades, or else they have gotten used to doing laundry while taking a shower. Many professors live in modest dwellings and drive older cars like graduate students.

Do not spend a lot of time picking your clothes to present a certain image. If you always dress in black, you run the risk of being mistaken for Johnny Cash. Do not order expensive items in a dinner menu or wine list to proclaim your importance, especially if someone else is picking up the tab (typically the taxpayer.)

### ***B.44 Academic free-lancing is meaningless***

Mastering a “tool” and looking for problems to solve using the tool does not advance science even under the pretense of the interdisciplinary approach. Take time to learn both the tool and the physical, engineering, or philosophical problems that you want to solve. When you give a seminar, do not defer answers with an awkward or dismissive smile, but be prepared to explain and discuss every little detail presented in your talk.

### ***B.45 Never use canned computer code, including molecular dynamics code***

Do not publish research papers with results obtained using computer codes that you have purchased or downloaded from the Internet without having studied, understood, and verified the source code; language compilers and computational environments, such as *octave*, are exempt from this rule. Scientific code is neither a spreadsheet nor an *app* that should be downloaded and run on a smart phone. No professor or researcher has ever built a good reputation by running canned codes. Write your own code.

### ***B.46 Do not fall prey to the academic publishing pyramid scheme***

The standard academic publishing pyramid has a single idea at the apex, four journal papers at the first level, sixteen conference abstracts at the second level, and sixty-four or more seminar presentations at the third level. One paper or two papers per idea is plenty.

### ***B.47 Consider writing a book***

If everyone spent all their time writing grant proposals and papers, who would write monographs and books? Consider the tremendous service that great authors of classical textbooks, handbooks, and reference books have provided to past, present, and future generations of scientists and engineers.

There is an alarming absence of new graduate textbooks in recent decades, probably due to the small size of the market. In some cases, students use time-honored but dated textbooks, sometimes written many decades ago. In contrast, there is a proliferation of new undergraduate textbooks, probably due to the large size of the market. Sadly, the material in these undergraduate books is progressively stripped-down.

To add insult to injury, grants to support the writing of high-quality textbooks are hardly available and most university administrations consider book writing a wasted effort. An unhinged committee or administrator would make a comment on an author's annual review to the effect: *Oh yeah, he/she wrote a book.*

In spite of these systemic difficulties, consider writing a book or monograph even the form of abbreviated notes that summarizes what you have learned or taught over the years. You will be proud of this accomplishment in time and you may make enough royalties in support of your favorite charity.

### ***B.48 How to write a book***

I am sometimes asked how to write a book. Here is my own recipe:

- Wake up at 3:30 am, make coffee, and turn on the computer.
- Start correcting what you wrote the day before. Write some new material based on mental notes you made the day before. Stop writing when everyone else wakes up.

- Do what you need to do during the day; In the course of the day, think of what you need to write the next day. Retire when the sun sets (like a farmer).
- Repeat for several years (including weekends and holidays).
- When you think you are done, leave the manuscript alone for six months.
- Repeat the correction cycle for several years.
- Brace yourself for readers, if any, trashing your book on Internet reviews. If you are a Professor, brace yourself for unhinged manifestations of professional jealousy.

### ***B.49 Publicize your work with modesty***

There is nothing wrong with feeling proud for an important discovery you have made or for an interesting idea that you may have had. Your should discuss and celebrate your good work with colleagues, students, and others. Unfortunately, some professors take this celebration to an extreme by inflating their ego and becoming intellectual legends in their minds. Most of these professors are oblivious to the negative reaction their ridiculous behavior evokes.

Disseminate and discuss your achievements and ideas factually, frugally, and honestly. Remember that your work is best promoted and amplified by others. Keep in mind that you are not in it for yourself, you are in it for advancing knowledge and improving our society at large in some ways. Let the quality of your work and your demeanor speak for themselves and become paradigms.

### ***B.50 Don't be ridiculous***

Ridiculous professors will advertise that their work will simultaneously or successively solve the energy problem, cure arthritis, and repair pin holes in copper plumbing tubes. Unfortunately, because the memo

explaining the concept of “the emperor has no clothes” has not reached all provinces of academia, the scientific community tolerates and often admires such egocentric behavior.

A similar ridiculous behavior is displayed by university administrators who regard themselves as rulers and do not hesitate to wield unrestrained power over vulnerable faculty and other employees.

### ***B.51 Do not seek honors and awards***

Honors and awards are most deserving of those who do not seek them or are inclined to decline them, including David Bowie and Grigori Perelman.

If you are offered or pre-offered an honor or award, think hard and decide if you really want to accept it. Contemplate possible immediate or long-term consequences and side-effects. Consider the possibility that receiving an honor or award, and temporarily or permanently feeling superior because of it, will be the source of survivor's guilt. Decide whether receiving an honor or award is consistent with your religious, spiritual, or other philosophical beliefs.

A pastor received a *best sermon* award, which he accepted with gratitude. In the award receiving ceremony across the country, the pastor gave a speech explaining that it was his religious duty to receive the award so that he can celebrate his God-given talent of writing sermons. The pastor could not advise the audience as to whether a prowler should also celebrate his talent of opening locked doors.

If you receive multiple honors and awards, keep them private in your mind or in your resumé. Do not list them in chronological order year-by-year in your web site or Wikipedia as evidence of sustained superiority. The obsessive pursuit of honors and awards is a symptom of an underlying egocentric or narcissistic condition.

### ***B.52 Do not declare your desk, office, laboratory, or cubicle a Center***

Do not declare yourself the Director of this Center.

### ***B.53 Do not issue Press releases***

A thoughtful Dean of engineering University once urged his faculty not to issue Press releases. A typical Press release reads as follows:

*Researchers at the Center for Research in Advanced Photonics (CRAP) have discovered a novel mechanism by which living cells can create accounts in social media. The results may have important consequences in quorum sensing and will help prevent bags under the eyes, cancer, dry skin, and heart disease, the leading cause of death in North America.*

You do not hear of this breakthrough ever again. Another such breakthrough is advertised in a few days.

### ***B.54 Do not append acronyms or a stack of titles under or after your name***

Your net worth is not a linear function of the length of initials, acronyms, and titles you append to your name. Only append initials or acronyms to indicate your expertise (e.g., MD, DDS, AAOR, ARELL0).

### ***B.55 Do not complain incessantly***

A wise professor grew impatient of hearing a younger professor complain about the state of affairs in his field of study and the poor quality of the work of others. The wise professor informed the young professor that he would listen to his complaints only when his accomplishments exceed by far those of others. The wise professor advised the young professor to concentrate on his work rather than compare himself to others.

If you don't like where you are or what you do, make a plan for change, alter the way you view things, or simply, leave – the world is big. Do not attribute your unhappiness or failures to others. Do not lead yourself to believe that the reason for a failure is that you are not tall enough, handsome enough, political enough, or that you speak with a certain accent. Let your failures be springboards.

The system works more or less, and you should accept the possibility that you may fall through the cracks as a matter of statistics at times. Realize that everyone does at multiple points in their lives.

### ***B.56 Be grateful for what you have***

There are greater tragedies in life than having a manuscript rejected or feeling under-appreciated in an academic or professional setting. Be grateful for what you have and are able to enjoy; perhaps the ability to care for your favorite fainting goat or the opportunity to take a walk in the park while having an aromatic cup of coffee.

### ***B.57 Becoming an administrator is not a natural career path***

Scientists derive immeasurable pleasure by learning, discovering, reading, writing, understanding, and thereby helping our societies and civilization advance through the ages to a better condition. Losing this source of pleasure and sense of commitment is truly sad.

Only if you feel that (*a*) your creativity is lost irreversibly, (*b*) you do not mind attending meetings all day long for the rest of your professional life, (*c*) you need high income even at your old age, (*d*) you require daily affirmation of authority by others, (*e*) you are an extrovert who enjoys communicating thoughts, trivial or not, all day long, and (*f*) you enjoy wielding power, should you consider becoming an administrator. If any one of these conditions is not met, do not become an administrator.



If you decide to become an administrator, take some courses in ethics and read in preparation books and articles on a wide variety of subjects in science, engineering, humanities, management, psychology, ethics, and current affairs.

After you become an administrator, recognize and respect the intelligence of the faculty and appreciate and acknowledge the hard work of the staff. Understand that they you are not an employer and the staff are not your employees. Refrain from oppressing and manipulating the faculty by making it appear that your plans are their plans, and realize that the staff are not your servants. Even though you may be the best-dressed persons in the room, you are not necessarily the smartest person in the room (consider that poor Department Head of statistics at the end of the table who agonizes over the relative benefits of classical and Bayesian statistics while you discuss the budget.)

### *B.58 The more things change, the more they stay the same*

A new administrator is hired at a university at a high salary that is equivalent to a quarter of the budget of the Physical Plant Services (weeds start growing through cracks on sidewalks.)

He or she announces a brilliant half-baked plan involving thrust areas, initiatives, and focal points that may be fifteen years too late (tedious materials science), defy some laws of physics (design a car that runs on its own), or does not make sense (merge the entomology with the political science department.)

Pertinent faculty and center directors are hired, a mélange of associate deans are appointed, faculty that do not fit in the plan are made to feel miserable so that they will leave voluntarily or retire (thanks to tenure they cannot be fired), and a fortune is spent at taxpayers' expense. Perhaps a state or federal bond is issued to support the brilliant plan.

In five years or less, the administrator has moved to a higher position or, in some rare cases, downgraded to a plain professor to join their spouse who was hired gratuitously when the administrator joined the institution, and the plan was hardly implemented. A new administrator with another brilliant half-baked plan is hired and the cycle is repeated.

The University endures thanks to the hard work of mainstream faculty and underpaid staff who survive relentless streaks of emails (institutional spam.)

### ***B.59 Express genuine admiration***

Be happy and proud that the person in the office next to yours is smarter or more talented than others, including yourself. Try to figure out his/her thought process and inner workings of his/her brilliant mind. Engage in a noble intellectual competition knowing that you are bound to lose.

### ***B.60 Keep in mind that most students have been short-changed***

Five weeks into their first semester, the graduate students realized they have been short-changed by their undergraduate institutions where they were offered watered-down courses with "practice exams" preceding virtually identical exams where everyone received an A grade, except that a few got A+.

The professor of the graduate course knew all along that the students would become frustrated at some early point and urged them to keep plowing and stay the course. The professor also knew that the students will appreciate in time the high standards and the tough-love approach (over the years, he had received numerous notes of appreciation.) At the end of the semesters, all students passed with good grades the graduate course.

### ***B.61 Do not flatter indiscriminantly***

Indiscriminate and deliberate flattery won't get you anywhere. It will degrade your self-esteem and erode the respect of others.

### ***B.62 Show your students tough love but be aware of mental health issues***

Do not water down your courses. The students will realize and resent the low threshold after receiving easy grades and graduating with a suspiciously high grade-point average (GPA). You will regret the deception when you look back at your life as an educator at the conclusion of an illustrious career decorated with distinguished-teacher awards.

A Dean has ruled that parental input is welcome in determining the content of science and engineering courses. An unintended consequence was that the curriculum was watered down to the level of being almost exclusively qualitative and taught with PowerPoint presentations, as in design a bridge with no equations and learn math by way of field trips.

Engineering companies recruiting on campus became suspicious, paid little attention to the grade-point average (GPA), and administered their own competence test, euphemistically called a comprehensive test. Because only one out of ninety-six students passed the test, the companies decided to abandon on-campus interviews to the detriment of employment prospects of the graduating seniors. The University administration remained unflinched: they always know what is best.

### ***B.63 Consider whether you are prepared and willing to supervise graduate students***

Decide whether you are prepared to supervise graduate students and teach them what they need to be taught, including critical thinking and writing. If you are not prepared, or do not have the time, or cannot find interested or qualified candidates, do not agree to supervise graduate

students for the purpose of padding your resume. You will ruin their lives and regret the act at the end of an illustrious career decorated with best-researcher awards.

It is not uncommon that a graduate student leaves the University without a graduate degree or with a rushed meaningless degree after his/her normative time has expired, typically eight years (note the annoying use of a double negative.) Graduate students are human beings, not inanimate resumé items.

### ***B.64 Stay clear of people with aggressive and overbearing personalities***

Minimize your interactions with them, do not reply to emails, screen out and do not answer phone calls, stop going to faculty meetings, do not respond to insults, turn the other cheek, and do not be coerced into making statements. Be evasive when you get cornered, remember and use the phrases "*this is not for me to say*" and "*I will let others be the judge of this.*" If necessary, lapse into the *broken record* mode.

However, speak up immediately and with a loud voice when you see something wrong.

### ***B.65 Remember the fallacy of the intelligent professor***

Institutions, businesses, enterprises, relationships, and individuals, are best classified into three categories: *those that are good; those that are no good, and they know it; and those that are no good, but they don't know it.*

Entities in the first category recognize that things can change over a period of months and work hard to maintain and improve their status. Entities in the second category seek improvement, redemption, or salvation by pursuing successful or unsuccessful action plans. Delusional entities in the third category stay where they are or aggregate at the bottom where they belong.

Intelligent professors and other professionals that belong to a first-rate institution tend to think that they will have a walk in the park and will be treated with ultimate respect once they join a third-rate institution. Unfortunately, without exception, third-rate institutions drag them down and then dismisses them as cranks, unconventional, or unable to work with others. This fallacy of the intelligent professor can be classified as a yet undocumented cognitive bias.

An intelligent, talented, or ethical person should consider joining a second-rate institution as a public service to the community or broader world of academe. An intelligent, talented, or ethical person should never join a third-tier institution.

### ***B.66 Treat senior professors, colleagues, and others with respect***

Seniors professors and senior citizens have lived through situations and circumstances that you have not yet met and cannot possibly fathom. Have you had to teach on the day that your former spouse served you with divorce papers and claimed full custody of your favorite pet?

A young professor got educated thanks to books written by an older professor whose name did not retain. In a grant proposal review panel, the young professor dismissed a proposal submitted by the older professor stating that the principal investigator is not familiar with the subject matter (unbelievable but true story.)

A meritorious research proposal was rejected when a young professor stated in a review panel that red blood cells are rigid spheres, not deformable liquid capsules enclosed by an inextensible membranes as the author of the proposal accurately claimed (unbelievable but true story.) It usually takes one negative comment, absurd or not, for a research proposal to be rejected in a research review panel. Research program directors can afford to approve only a tiny percentage of proposals and will reject proposals based on lukewarm evaluations, absurd or not.

Some junior professors do not realize how poorly senior professors are treated until they themselves get academically old.

### ***B.67 Remember who hired you***

Once hired, some professors tend to forget that they were hired by the existing faculty and treat them with indifference or disrespect. Some new faculty regard existing faculty as obstacles in their ascend to academic nirvana. Other young in age or mind faculty exhibit teenager-like know-it-all arrogant attitudes. Isaac Asimov wrote that *"people who think they know everything are a great annoyance to those of us who do."*

### ***B.68 Do not be passive aggressive***

Wikipedia defines passive-aggressive behavior as the *"indirect expression of hostility, such as through procrastination, hostile jokes, stubbornness, resentment, sullenness, or deliberate/repeated failure to accomplish requested tasks for which one is (often explicitly) responsible."*

Never say to a student, colleague, friend, spouse, relative, or anyone else: *"I am sorry that you feel this way."* Do not drop subtle hints on your superiority, factual or perceived. Touting your own horn is both irritating and alienating. Unless requested or absolutely necessary, do not correct other peoples' typographical errors.

Passive aggressive behavior is sometimes followed by attempts for redemption. Recognize and be aware of these symptoms.

*Exercise:* A Department Head wrote a Newsletter with numerous language and factual errors. Should a professor or staff member point out corrections?

### ***B.69 Treat junior professors, colleagues, and others with respect***

Make them feel important and appreciated, allow them to remain neutral in departmental and university politics, show them by example the way of becoming true researchers and scholars. Refrain from giving them general advice for success. Assume that everyone gets tenure and becomes a full Professor, unless something goes seriously (not slightly) wrong.

A senior professor should never ask a junior professor to “join forces” in research, especially in the presence of startup funds. A senior professor should never “co-teach” a course with a junior professor. Guess who will produce ideas and do the vast majority of the work.

### ***B.70 Avoid passing judgment***

Pass judgement onto others only when it is an obligatory part of your job, and then do it reluctantly. Keep your opinions to yourself otherwise. Do not ask from others what you do not ask from yourself (send someone else’s daughter or son to fight a war.)

Faculty committees on tenure routinely affirm criteria for awarding tenure to young professors. More often than not, committee members have neither published extensively nor received meaningful research grants. When questioned, committee members typically respond that their job is not to evaluate themselves but others. Empowered committees and unhinged administrators decline to comment whether Einstein would have met the criteria for tenure as a young scientist working on the viscosity of suspensions of spherical particles.

### ***B.71 Do not criticize anyone who is not present (including the dead)***

If someone else is doing it, ask them to stop. Walk away if a person keeps maligning the absent or the dead.

### ***B.72 Keep your mouth shut***

In a meeting that lasts  $n$  minutes with  $p$  people present, do not talk more than  $5n/9p$  minutes. The factor  $5/9$  allows for interludes and trivial comments.

Invent ways to occupy your mind if someone else talks forever. Observe different rectangular objects in the room and estimate whether the ratio of their linear dimensions is close to the golden ratio.

### ***B.73 Do not write exaggerated, inaccurate, and meaningless letters of reference***

A wise professor once said that a letter of reference should not be confused with a letter of recommendation. An adviser kept writing year after year that his current graduating student is the best student he ever had. Implied in his statement is the assumption that the improvement is small enough to ensure a converging geometrical series. The adviser did not have a good grasp of the underlying mathematics.

### ***B.74 Participating in a hiring committee does not make you an employer***

Your institution has trusted you with the job of hiring a person, faculty or staff, and you must act with fairness, respect, and a sense of responsibility in the best interest of the Institution; not in the best interest of yourself.

Dress properly, treat the interviewees as honored guests, do not put your feet on your desk in disrespect, do not ask inappropriate questions that you yourself are not prepared to answer, do not ask the interviewees if they are interested in working with you once hired.

An interview is not an exam or interrogation. The tables can be easily turned and you can be on the receiving end.



### ***B.75 The staff are not your servants***

Make your own coffee, schedule your own meetings, do not walk into their offices without knocking on the door, do not burden them by sharing your personal problems (they have theirs), invite them to your house parties along with faculty you want to impress.

Do not regard your social interactions with the staff as proof that you are normal.

### ***B.76 Do not turn a research proposal into a paper***

Some research proposals for grants attempt to impress by volume, excessive and exaggerated promises, or both. Be honest, factual, and pragmatic in what you propose. Delay writing a proposal if you all necessary pieces are not clear in your mind.

A research proposal is a poor starting point for writing a paper that will help you build a reputation and withstand the test of time.

It is fine to do the inverse, that is, convert a paper into research proposal for the purpose of addressing open questions that you identified while conducting your research.

### ***B.77 Ignore unsolicited advice and discard recipes for success***

Most unsolicited advice givers percolate their directives through narrow-minded, selfish, or perfunctory filters. There is a special place for poor advice givers in Dante's *Inferno*.

A Dean or Department Head in a third-tier university will demand that professors secure a lot of grants, so that the administration can pay their bills from their cut. The administrators will tolerate a small fraction of scholars with few on no grants as proof of academic standing of a third-tier Institution.

However, excessive research grants can hurt one's career if the results of the research are not commensurate with the dollar amount received. A damaged reputation as an empty spender is hard to repair. Accountability is the hallmark of a successful administration, government, funding agency, private enterprise, or any other functional institution. In the absence of accountability, structures and relationship eventually collapse.

If you need good advice, you need to pay for it , or else consult with an experienced and trusted friend that can offer more than a listening ear. Let their advice and your judgement and intuition be your guide.

### ***B.78 Some things are inevitable***

As you advance in academic seniority and write good papers and books, you will experience and should be prepared for an unexpected course of events:

You publish a good piece of work or make an important discovery; your colleagues catch up in five to ten years; others quietly or incessantly build on your work by straightforward or trivial extensions; as progress is being made, your seminal contribution is mostly forgotten (though you receive hundreds of papers to review), and credit, honors, and awards are offered to others.

Do not become bitter, feel good about yourself and your contributions to the long-term advancement of our civilization. Remember that the weakest links of human nature always prevail. Let laughter be your shield.

### ***B.79 When the Devil comes knocking on your door, he will pretend to be your friend***

The Devil will offer to proof-read your research proposals, paper drafts, and book manuscripts.

The Devil will ask you to participate in research proposals whose sole purpose is to secure grants under the directive: *“let’s send out this proposal and we will think of the science when the funds come in.”* The Devil will make suggestions as to whom you should vote as a department head or a member of a certain committee.

When the Devil knocks on your door, turn the lights off, close the curtains, hide under the desk, and do not open the door.

### ***B.80 Beat them in their own game***

An academic department used a formula for faculty salaries that weighed heavily fellowship to professional societies and much less scholarly activity, such as publishing books and papers and posting interesting documents or essays on the faculty web sites.

The use of such salary formulae are commonplace in second- and third-tier institutions. First-tier institutions wouldn’t care less about fellowships in professional societies and are interested exclusively in raw intellectual presence or achievement. When you walk down the hall of a first-rate academic department, you can sense the IQs spilling out from ajar doors and under closed doors.

A professor compiled and studied the requirements for fellowship to professional societies pertinent to his field and identified the one with the minimum requirements. After a couple of phone calls, the professor was elected a Fellow of that society. His department had no choice but raise his salary. The professor explained his technique to others.

In beating a flawed system in their own game, make sure you don’t compromise your own ethics.

### ***B.81 Do not punitively fail graduate students***

Exercise restraint and reign your primitive instincts for punishment and revenge directed against the advisers. Remember that students are

assigned projects and are guided by advisers. It is not their fault that some projects are flawed or derivative.

### ***B.82 Behave like a Professor***

A Professor behaves like an academic and confers opinions only on things that she knows.

### ***B.83 Not getting tenure means nothing***

Not getting tenure should not be regarded a failure of the candidate, but an indictment of those who award tenure. Institutions should be penalized instead of rewarded for declining tenure. University administrators and others should be reprimanded for skewing criteria for tenure to fit their brilliant plans (every administration's half-baked plan is brilliant.)

Not getting tenure mostly indicates that the candidate did not deliver what others wanted of him/her and did not comply with the agenda of his/her Dean or department Head. Many departments hire unsuspecting untenured faculty members indiscriminantly, while the Dean and the Provost wink at the Department Head to reassure one another that they will get rid of the suckers at tenure time. The difference between a professor who gets tenure and a professor who does not get tenure is often infinitesimal.

Many brilliant professors have been denied tenure. On occasion, astonishing denials leak to the Press. Unfortunately, the Courts almost always side with the Institution in the absence of recourse.

### ***B.84 Remain humble and meek***

While attending a national meeting, a prominent professor who was an elected member of multiple national academies was asked why he chose to stay at a cheap motel that also served as a homeless center. He reluctantly explained that staying at an expensive hotel in spite of the

surrounding poverty at the taxpayer expense did not seem right. Note that the professor did not criticize others who stayed at the sparkling hotel where the meeting was held.

Another prominent professor retorted that he would have paid from his own pocket instead of his grant to stay at a five-star hotel (doubtful), and stated that spending the night at a second-rate hotel was beneath his standards (the professor was a legend in his mind.)

If he staid at the cheap hotel, perhaps the professor would have noticed that the part-time receptionist is a brilliant graduate student working on an improved *pancake sorting* algorithm studied by Bill Gates and Christos Papadimitriou, and would have learned something new that day (he has not learnt anything new in years.)

Realize that your importance does not depend on how you perceive yourself, but on how you are perceived by others.

### ***B.85 Try Linux***

You must certainly have a spare desktop or laptop computer. Install on this computer a flavor of Unix or Linux, such as the fabulous *Ubuntu*, and try it out for a few hours each week. The installation of the system and accompanying apps is safe and free. My neighborhood cat is prepared to bet a few precious Friskies that you will abandon your current system and migrate to Linux in a few months.



# *Part C*

## *Red Leaves*

*"If, at the end of it all, according to our abilities, we have done something to make others a little happier, and something to make ourselves a little happier, that is about the best we can do. To make others less happy is a crime. To make ourselves unhappy is where all crime starts. We must try to contribute joy to the world. That is true no matter what our problems, our health, our circumstances. We must try."*

Roger Ebert

### *C.1 Adjust your prism*

You cannot change the way most things are, but you can change the way you view the world and your own presence. If one day you decide to regard your undergraduate advisees as your spiritual children, it will bother you much less that you spend a few days each year offering them personal, academic and professional advice (time taken away from writing three-page papers to pad your resume or presenting your precious research at marginal conferences.)

## ***C.2 Do not reject or ridicule what you don't understand***

Few people have a clue on how their car engine or smart phone works, yet most people feel qualified to recite arguments on the existence of God. Does a limited amount of rational intelligence provide us with a license to debate every possible subject in a conference room at the top floor of the Babel Tower?

## ***C.3 Wait for two weeks***

In making a conscious effort to improve your writing, character, behavior, relationships with others, health, or anything else, make a plan and stay with the plan for a period of *two weeks*.

Like a course of antibiotics, two weeks appears to be a necessary length of time before substantial progress can be observed or achieved. Do not monitor your progress in the meanwhile, Take inventory at the end of the two-week period and repeat, if necessary.

Roughly two years are necessary for adjustment or habituation to a profound or life-altering event. Learn how to ignore and ridicule the pain.

Habituation is a natural biological and psychological process expedited and facilitated by the tincture of time.

## ***C.4 There are plenty of good people***

A good person is not necessarily well-educated or well-read. In fact, in some cases, the more educated a person is, the more elitistic, ego-centric, egotistical, dismissive, domineering, intolerant, imperious, and discriminating the person becomes.

Comparing accomplishments to eulogy virtues, David Brooks wrote an insightful essay and an interesting book: *"About once a month I run across a person who radiates an inner light. These people can be*



*in any walk of life. They seem deeply good."*

Pay attention to eulogy virtues, less attention to resumé accomplishments. Make a conscious and sustained effort to stay or become deeply good.

### ***C.5 Do not accept sacrificial lambs***

A professor visited his homeland after a long absence. After a few days, he realized that most of his nominally uneducated relatives and old friends were, in fact, much more educated, kind, compassionate, curious, and bright than most of his university colleagues. When he visited distant relatives at a village, word spread out that a professor was visiting and a friend of a friend offered to slaughter a lamb in order to celebrate the occasion. The professor assured them that this was not necessary on account of him being vegetarian.

### ***C.6 Do not be afraid to be an outcast in a flawed culture***

Remain honest and ethical, do not let the environment define your ethics and moral metrics. It does not matter what others think or do, it only matters what you think or do. Arguing that you are speeding on the freeway because you are following traffic will not save you from getting a traffic ticket. There is no group admittance or bus tours to salvation behind the barricades of heaven.

Consider the following pieces of advice:

- Speak up as soon as you see something wrong
- Speak up as soon as you see someone being treated poorly
- Do not say or do anything that you do not mean
- Do not say or do anything that you cannot reverse
- Do not be afraid to apologize
- Take time to review essays on science and societal ethics
- Do not promise things you cannot deliver

- Do not mislead and do not make quid pro quo deals
- Do not tell misleading truths
- Do not reveal partial information: either total or none
- You may use white lies on occasion to spare peoples' feelings

Calculating the impact that doing the right thing may have on your getting tenure or advancing your career is not ethical. Unless you get spiritually hardened, you will regret the calculation at some early point of your career.

Martha Stout (*The Sociopath Next Door*, Harmony 2005) found that one in twenty people are conscienceless sociopaths who exhibit no empathy or affectionate feelings for humans or animals. Make sure that you are not on your way to becoming a member of this deplorable group.

### *C.7 A professor can be a hero*

It is often said that real heroes are ordinary people who wake up to work every morning, rain, shine, or snow, in health or sickness, feeling well or unwell, having to work with a good or bad boss, with little or modest pay.

Other heroes with chronic physical pain or mental anguish plow quietly through life without complaint. You see them all over the place: greeting you at Walmart, bagging your groceries, changing oil in your car, serving you quarter-pounders.

As a graduate student, I was in the habit of working from eleven o'clock in the morning to four o'clock at night in my office when the building was quiet. A custodian visited my office to empty the trash at nine o'clock each night. We looked forward to seeing each other and I discovered that he was Vietnam vet suffering from PTSD, living on a small pension and a meager salary with a loving wife and a few delightful kids. The custodian was a happy man and never complained.

An intelligent young woman had a job cleaning hallway floors and bathrooms starting at three o'clock each morning so that she can finish in time before the "professionals" arrived later in the morning. An early-bird professional once thanked this woman for her good work, but she could not bring herself to complain about the unnecessary mess the professionals made the bathrooms.

If you are an honest professor who works for the common good, contributes to the advancement of our civilization, and sticks to your ethical principles until the bitter end, you are also a hero.

### *C.8 Detect and stay away from manipulators*

When a comment is made or a new conversation is initiated, a manipulative person launches diversion tactics, also known as pivoting or inflection, that ends up in discussing his/her own experiences with a manipulated outcome to achieve a certain goal or merely change the subject.

At the end, a new set of issues of interest to the manipulator dominate the conversation. Manipulators typically do this because they have nothing interesting to say. Identify and minimize your interactions with manipulators.

### *C.9 On the sublime*

M. G. Piety wrote: "*The spectacle of greatness is always edifying because there is something sublime about it*"

(<http://mgpiety.org/2015/06/14/on-greatness>). This remark is as accurate as it is uplifting. Roger Ebert wrote that it was exhilarating to watch the movie *Jacob's ladder* in that he was able to observe filmmakers working at the edge of their abilities and inspirations.

Witnessing elevated states of the human condition in the arts, sciences, engineering, humanities, medicine, politics, justice, or everyday life is proof that, despite occasional setbacks, the human race is headed

to a better state where life and freedom are respected and revered in any form, and the good of the Universe is placed well above the good of an individual person or group.

Honors and awards are replaced by self-discipline and self-respect in the ideal state, people are embarrassed to wield power on others or flatter themselves, poverty has been eliminated and the notions of self-promotion and greed are regarded as poisonous and archaic.

The rejection of pipelines that cause irreversible damage to the environment is another instance of the sublime. Bob Dylan's hesitation to accept the Nobel prize is an instance of the sublime. David Bowie's refusal to become a Sir is an instance of the sublime. The rejection of miscellaneous honors, awards, and a million bucks by Grigori Perelman is an instance of the sublime.

Everyone is capable of mediating the sublime independent of social, economic, and professional standing. A person who puts a quarter in the washing machine at a public laundromat for the next person to use is an actor of the sublime. A professor who declines a grant for one of his/her colleagues to receive is an actor of the sublime.

It is unfortunate, yet expected and irrelevant in the greater scheme of things, that the prevailing culture downplays the sublime by romanticizing, heroifying, and then maligning the actors of the sublime.

### *C.10 The erosion of morals is fast*

The erosion of morals always begins as a small creak and grows quickly into an overwhelming river that obliterates everything in its path.

### *C.11 Do not make others feel crummy*

My engineering background has taught me that one should worry only about things one cannot take back or fix by some type of redemption. How do you test for such things? The answer was given by Professor

Maya Angelou:

*"I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel."*

These profound lines are often described as an old adage without due credit. Consider how much introspection and extrospection Professor Angelou had to perform in order to elevate herself to the condition of being able to articulate such profound truths.

### ***C.12 Use a thermometer***

A frog is placed in a pot of water whose temperature is gradually raised. The frog gets used to the rising temperature and does not feel the need to jump out of the pot until he has been boiled alive. This cruel thought experiment is teaching us important lessons.

Monitor the ambient temperature to ensure that you are not becoming a boiling frog by getting accustomed to a deteriorating or abhorrent environment. Make sure you do not tolerate, accept, support, or make excuses for an unethical culture.

### ***C.13 Be giving and be generous***

The world has given you a great deal, give something back. Post tutorials, notes, codes, advice, or anything else that seems useful on the Internet. If you have managed to replace the gearbox actuator in your car, let others know. If you have managed to overcome a psychological condition or disorder, let others know. Sometimes all you need to do is lend a compassionate ear.

### ***C.14 Charm is overrated***

Charm is the power or quality of dispensing delight and evoking admiration. Charm is an adorable quality of children but not adults. Charm is the quintessential attribute of sociopaths and con artists. Do not

attempt to charm your way through life. In an insightful comment regarding charisma that can also be attributed to charm, Garrison Keillor said: "*Charisma is a matter of lighting.*" Some people will find you delightful, other people will find you irritating.

Instead of attempting to be charming, strive to be respectful, pleasant, amiable, and express a sincere interest in others. Do not ramble and do not assume that everyone is interested in your adventures, misfortunes, or stories. Do not change the subject of a conversation pertinent to others. Be sincerely interested in other peoples' opinions and insights.

### *C.15 Some things are priceless*

What is the price of the quadratic formula, the method of completing the square, or the Bessel functions if there were not broadly available?

What is the price of a dusty old book hidden in a huge library that helps you understand the meaning of life?

What is the price of watching a delightful fawn turn his back to his siblings so that she can enjoy a wild onion all by himself?

Some things are priceless. Learn how to recognize, cherish, and appreciate such things.

### *C.16 You don't have to be a professor to be an expert*

An enlisted officer spent years at a time in foreign lands. He made a point of learning the recent and old history and cultural heritage of each land. By the time he retired, he had acquired an impressive body of knowledge in world history, comparable to that of a bona fide professor. The officer was probably the only person in the country with such vast expertise loading as a part-timer concrete bags at Home Depot.

You can follow this intellectual paradigm by studying the history of your community or state. A mind occupied with good things is a healthy mind. Enough with sports and entertainment.

Other interesting and curious people have mastered automobile history, conceptual physics, classic car restoration, linguistics, cognitive and popular psychology, construction technology, nutrition, gardening, computers, and other random subjects. Many computer administrators have developed their expertise as a hobby while pursuing college degrees in such irrelevant subjects as cruise boat hospitality and pest control administration.

Use your free time to become an expert on a subject that interests you. Consider self-publishing an indie book.

### *C.17 Uploaders and downloaders*

The world of scientific computing is divided into uploaders and downloaders; the rest of the world is divided into givers and takers. Consider becoming a giver and an uploader.

### *C.18 You can learn something from everyone*

You may learn more from the university staff than from your faculty colleagues. Your cat will teach you how to tough it out, suck it up, wait it out, and bear the brunt. You may not neglect your duties and must provide acceptable food for breakfast, lunch, and dinner independent of circumstances; otherwise, a relentless meowing will be heard.

Petting is allowed only when she deems appropriate. The cat is always well groomed, thanks to her superb self-cleaning techniques. When in doubt, she runs to a safe place, typically under the bed. It takes her two years to trust someone; once she does, the trust is deep-rooted and everlasting.

### ***C.19 March forward***

Joining the Boy Scouts will teach you how to march forward independent of circumstances and against all odds; never give up and never accept defeat; be inventive and adapt to unforeseen circumstances; when things tough think that you will figure it out.

Three boy scouts missed the bus that would take them from a village to the camp, carrying bags of food for their troop. They made it to the main road and started walking toward the camp, a good ten miles away with little hope to make it back in time. Shortly afterward, an unscheduled extra bus showed up, picked them up, and delivered them to their destination.

### ***C.20 Do not pretend that all is just fine***

When you are obviously troubled and someone asks you how you are, give them a true sense of yourself by replying "*Not so good, but thank you for asking.*" Do not be concerned that the person will misunderstand or mischaracterize you. You may be surprised that the person may lend a sympathetic ear or offer some meaningful advice and help.

### ***C.21 Do not ask personal questions in small talk***

*"A man ought not to make mention of a halter in the house of a man that was hanged."* (The Oxford Dictionary of Proverbs, 1599, J. Minsheu, Spanish Dialogues.)

When you meet a person from another country, especially a remote, struggling, or developing country, you should *never* ask how things are back home and how often the person visits the homeland in making small talk. Almost always you will pick a scab that barely contains a deep wound. The best answer the person could (and should) give you is: "*Things are fine; why do you ask?*"



If a person asks you personal questions pertaining to your homeland, classify him/her as thoughtless and clueless and stay away from him/her to prevent further emotional damage. If you sense that someone wants to discuss sincerely a personal matter with you, and you feel like having this discussion, issue an affirmative visual or verbal cue.

Wise people are careful to never ask potentially harmful or upsetting questions, especially in small talk. A wise person never extolls the virtues of having a spouse, children, and a brilliant pet to a lonely soul.

## *C.22 Work with meraki*

The Greek words “*philotimo*”, “*meraki*”, and “*meraklis*” defy precise translation. The word “*meraki*” is of Turkish descent.

We say that something is done with meraki when it is motivated by unconditional and pure interest, not by obligation or expectation of profit or recognition, and is done with meticulous attention to detail. You can work, cook, play a musical instrument, make furniture, complete a mathematical proof, or write a computer code with meraki.

Teachers teach with meraki with no regard to pay, cobblers repair shoes with meraki with no regard to pay, faculty assistants schedule seminars and prepare newsletters with meraki with no regard to pay, engineers design bridges and build cars and MRI machines with meraki with no regard to pay. You too can work with meraki.

## *C.23 All alone in the woods*

The hard-to-translate word “*waldeinsamkeit*” describes the feeling of being engulfed by nature when being alone in the woods. Set as a goal experiencing this feeling at some point in your life. Allegedly one of the hardest words to translate is the Bantu word “*ilunga*”. As an exercise, attempt to translate this word into your native language or learned foreign language.

### *C.24 Being lazy is a waste of your life*

The days may seem long but, when you look back, the years will seem short. Do not waste any precious moment of your life. Recreational and fun time is not lazy time.

### *C.25 Many aspects of life are a zero-sum game*

Make sure you don't receive more than you deserve in terms of grants, salary, reputation, privileges, honors and awards. If you get more than you deserve in a zero-sum game, another person who is equally or more able or qualified than you receives less. Consider whether you have taken chances and worked hard for what you are getting. Consider whether others have taken chances and worked hard for what they are *not* getting.

Do you really need so much money invested in high-performance stock funds that go up in value every time a swath of employees are laid off? Do you really need to receive so many prizes, honors, and awards each year?

Some zero-sum games are easy to spot, while others can be hard to spot. Some games are falsely classified as zero-sum due to misunderstandings concerning available opportunities or resources. Contrary to some religious and spiritual beliefs, internal peace and happiness is not a zero-sum game; you should try to get as much as possible without guilt.

### *C.26 Let someone else have a break*

A Master and a Grasshopper were taking a walk in the park. The Grasshopper noticed a ten-dollar bill on the ground and instinctively rushed to pick it up. The Master asked the Grasshopper to leave it on the ground so that someone else can pick it up. In fact, the Master had seen the ten-dollar bill well before the Grasshopper, even though he was legally blind.

If your department, organization, or community wants to nominate you for an award, let them know that you appreciate the gesture but you would rather have another person receive the nomination. No need to explain. Believe me when I say that you will not regret this generosity as you get old.

### ***C.27 Sometimes the wrong answer is the best answer***

Never second-guess yourself and always follow and be proud of your spontaneous honesty. Your first reaction is always the best reaction. Statistically, your good instincts will lead you down the right path.

### ***C.28 Do not let anyone intimidate or bully you***

Wikipedia defines bullying as *"the use of force or coercion to abuse, intimidate, or to aggressively impose a certain type of domination over others. The behavior is often repeated and habitual."*

Bullying is typically directed to people that are different in some ways with respect to a stereotype, pose a threat by their intelligence or some skill, or are vulnerable in some ways (overly sensitive and emotionally fragile.)

There are different types of bullies, including loud bullies, quiet bullies, stressed-out bullies, old-school bullies, political bullies, organizational bullies. All bullies are sociopaths who spend their days manipulating others and their nights making plans on how to manipulate others. In academe, we encounter privileged bullies in the form of eminent scholars or anointed administrators who exercise unilateral control over the success, failure, and academic freedom of others.

A university staff member once broke down in tears during a presentation by a university consultant on bullying when she realizes that she has been the target of explicit or implied bullying due to her talent, honesty, and straightforward demeanor, perceived as a threat by her

supervisor. The administration paid lip service to bullying issues, while making sure they are prepared for legal contingencies, shielded by an echelon of attorneys.

### *C.29 You need at least one good friend or confidant*

A friend should not be confused with someone with whom you share enemies or misfortunes; the enemy of your enemy is not necessarily your friend. A friend should not be confused with someone that you chat about the weather or sports in small talk, relate your experiences in shopping or publishing, or gossip about popular culture and current events.

A friend will give you advice that is in *your* best interest. A friend will defend you in your absence and will be glad when you succeed. A friend will drive you to the hospital and wait for hours in the emergency room or during surgery. A friend will let you get mad at him/her and not get offended. A friend will never speak poorly of you to others.

The best way to find a friend or confidant is to first become their friend or confidant. You can assess whether you have become someone's friend by monitoring your reflexes and feelings when something good happens to them. You can assess whether someone has become your friend by monitoring their reflexes and feelings when something good happens to you.

### *C.30 Dismiss the inner expert*

At times of suffering, distress, or grandeur, an inner expert awakes inside us in lieu of a demon. The inner expert has all the answers to every question that can be possibly posed. The inner expert thrives on cognitive dissonance and confirmation bias by rejecting information that does not support a chosen viewpoint. The inner expert will insist that nothing is your fault, it is *a/ways* someone else's fault or the system's fault.

Get rid of the inner expert as soon as he rears his ugly head with the help of your own thought process, a professional, or a friend.

***C.31 Make sure you do not discriminate consciously or unconsciously against others***

Enough said.

***C.32 Do not throw anyone under the bus***

Wikipedia informs us that *“to throw (someone) under the bus is an idiomatic phrase meaning to sacrifice another person often a friend or ally, who is usually not deserving of such treatment, out of malice or for personal gain.”*

Ambitious administrators and miscellaneous unhinged professionals are notorious for throwing each other and innocent bystanders under the bus in their ascent to the administrative, academic, or corporate nirvana on their way to a high-pension retirement. Those who throw others under the bus have a special place in the Inferno.

The feeling of being thrown under the bus is one of the most painful and distressing feelings one can endure. The loss of trust and friendship inflicts deep wounds that are slow to heal. Anxiety and fear similar to those developing after a sudden traffic accidents commonly arise. The associated phobia makes a person be afraid that something bad will happen to them unexpectedly at any time.

Betrayal cannot be overcome. If you got thrown under the bus, make a consistent effort to overcome the psychological consequences and not let it change your broader views and perspectives in life. Classify the thrower as an inferior state of the human condition. Consult with a friend or professional, if necessary.

### ***C.33 Do not engage in trivial debates (great taste v. less filling)***

Do not let others drag you through the mud and into a snake pit. Evaluate the level of the debate and decide if you should literally or figuratively stay or walk away.

### ***C.34 Do not develop schadenfreude***

The Germanic word *schadenfreude* describes pleasure derived from the misfortunes of others. The closest English word of Greek origin is the word *epichairekakia*. The opposite of *epichairekakia* is *compersion* (antonym), which is conveyed by the notion of *mudita*.

A villager who asks nothing for himself and preys that his neighbor's fainting goat dies exhibits *schadenfreude*. A professor who prays that his colleague's theory is flawed due to an erroneous minus sign also exhibits *schadenfreude*. Even if you don't like someone, wish him/her well and walk away.

### ***C.35 You don't have to forgive***

Contrary to conventional wisdom and religious or spiritual directives, forgiveness is neither desirable nor mandatory. Do not empower further those who have hurt you by struggling to forgive. Classify an offenders a an inferior state of the human condition, avoid running into them or hearing about them, and move on or move away.

### ***C.36 Denial is a stubborn state of mind***

Subject yourself to a reality check at a specific day each week to evaluate your environment's professional and ethical standing, your current state of mind, and your strengths and weaknesses in lieu of metacognition. Allow time for introspection and ask for the advice and perspectives of a friend or trusted colleague.

Observe the dynamics of the circumstances around you, assess alternatives, and formulate an exit strategy as a backup plan. You will be surprised of the calming effect that the mere presence of alternatives may have in your personal or professional life.

### *C.37 Why are professors paid so much?*

The reason that some professors are paid relatively high salaries to seemingly teach only a few courses each year is that most of them pay back a huge unseen price. Truth be told, a good percentage of them fall through the cracks, pay no price, and enjoy an unproductive and stress-free life after tenure.

True scholars have chosen a lifetime of imprisonment by their own thoughts that cannot refuse or escape. A brilliant spiritual novel entitled “*Zen and the Art of Motorcycle Maintenance*” exemplifies the process of obsessively seeking answers to elusive questions that cannot be answered.

True scholars pay a price similar to that paid by celebrities who have no choice but engage in a self-destructive, culture-mediated and media-mandated lifestyle.

### *C.38 The forgotten academic*

The forgotten academic, professor or teacher is a dedicated scholar or educator who has chosen to pursue an idealistic path in lower, middle, or higher education. The forgotten professor or teacher must overcome several serious obstacles in his/her efforts to ensure and maintain meaning in his/her mission:

- University, college, and other administrators who undervalue scholarly activity and meaningful high-quality teaching.
- Marginally ethical colleagues who teach classes with the objective of extracting the highest possible student evaluations.

- Opportunistic colleagues who conduct research in rotating fields with easy funding.
- Overly ambitious colleagues who spend most of their time formulating research centers whose quality is only a fraction of the quality of the sum and whose productivity is in inverse proportion to the financial support.
- A star-system that amplifies small differences in ability and performance and pays attention to appearances and the accumulation of honors and awards according to the Hollywood model.
- Egocentric and other annoying colleagues who advertise relentlessly that their work is fantastic and has phenomenal impact.

On the upside, forgotten professors are typically much happier and more interesting than marginally ethical, opportunistic, or overly ambitious administrators or colleagues.

With regard to the fourth item, it is a matter of fact that nearly all important discoveries have been made by solitary researchers or a natural pairs of researchers with complementary skills. The theory of relativity was not discovered by the Einstein laboratory, it was discovered by Einstein.

### *C.39 Do not be ashamed to pray*

Even if you are an atheist, ask others to pray for you. Please pray for me and say a prayer for the pretender (Jackson Browne.)

### *C.40 Most people and institutions are apprehensive of new ideas*

New ideas are threatening because most people and institutions know that most of them are good and true. The bearers of new ideas are first regarded as cranks, which is typically not enough to discredit them. At the second stage, the bearers are marginalized and deprived of essential



resources. None of this works, and the bearers are finally treated as visionaries, innovators, or saints. An array of sycophants show up to sign up.

### ***C.41 Battle of two wolves***

An insightful American Indian proverb:

*An old Cherokee is teaching his grandson about life: A fight is going on inside me, he said to the boy. It is a terrible fight and it is between two wolves. One is evil – he is anger, envy, sorrow, regret, greed, arrogance, self-pity, guilt, resentment, inferiority, lies, false pride, superiority, and ego. The other is good – he is joy, peace, love, hope, serenity, humility, kindness, benevolence, empathy, generosity, truth, compassion, and faith. This same fight is going on inside you and inside every other person, too. The grandson thought about it for a minute and then asked his grandfather: Which wolf will win? The old Cherokee replied: The one you feed.*

### ***C.42 Keep your sense of humor***

Listen to Woody Allen's hilarious moose. A seminar speaker once asked how long his talk should last. The host replied that the talk can last as long as the speaker wants, but the audience would leave sharply after 45 minutes.

A dentist was looking at my cavities and had to ask him to repeat everything because of the echo. Rodney Dangerfield said: *I looked up my family tree and I was the sap.*

### ***C.43 Respect those who live in a no-man's land***

Those who live in a no-man's land are faced with the uncertainty of which ruler or angry group will appear in the horizon.

### *C.44 Do not worry about your legacy*

The world does not need to remember you after you have expired. Only those who have fundamentally improved the course of our civilization and contributed to the understanding of our essence or Universe will be remembered in the far future; examples are Aristotle, Newton, and Einstein.

Those who have changed the course of our civilization for the worst will be ultimately forgotten or ignored.

### *C.45 Think before you subscribe*

Before you decide to subscribe to a certain philosopher or follow a certain leader, be prepared to face the dark aspects of the leader's psyche and the footnotes in the philosopher's mind. Anticipate being confronted by mirrored aspects of your own psyche or mind. The disillusionment can be avoided by defining and following your own Zen-like path.

### *C.46 How civilization improves*

It was a bitter cold winter morning, but a few students managed to make it to the eight o'clock class. The wise professor walked in freshly shaven, wearing old but clean clothes and a broad smile. He said:

*"You will discover that civilization does not improve by legislation; it improves by the resolve of a few students who gather to study physical chemistry on a bitter cold morning in an unheated room."*

Some years later, the students realized exactly what the professor meant.

### *C.47 Multiple choice question*

To make a new beginning at improving one's character or self, one

should enter into a noble competition with:

- A. The old or current self
- B. Someone one admires as a life or spiritual leader or role model
- C. A chosen divine being
- D. An admired family member, coworker or neighbor

The correct answer is E.

### ***C.48 Help from a position of strength***

Choose to help others from a position of strength, not from a position of weakness. Do not help others for the purpose of finding meaning in your own life; find the meaning, and then help others.

Consider this enlightening dialogue: *Master, how do you find meaning in your life? Answer: By helping you, grasshopper.*

### ***C.49 Do not expect or demand gratitude***

Pull others out of a wreck, make sure they breathe, and leave before you are seen. Make anonymous donations and do not ask universities to name buildings after you, your spouse, or pet. If your last name is Smart or Small, do not endow a professorship after your name.

### ***C.50 Confront your fears head-on***

The best way to get rid of your fears is to confront them head-on. If you dread running into your boss, walk into his/her office and calmly ask him/her to formulate a viable working relationship that would be beneficial to both. Repeat, if necessary, and revert to a broken-record mode. You will be surprised that, after some repetitions, the boss will dread running into you.

### ***C.51 Respect those who got uprooted***

Monk Ignatius' mother was devastated to learn that her only son decided to join a monastery. Monk Ignatius explained to his mother that he needs to dedicate his life to God, like his friend Iolas decided to dedicate his life to science by going abroad to study applied mathematics. A monk is not allowed to have contact of any kind with his family. The mother was comforted by the analogy and accepted her son's decision in time.

Iolas visited Ignatius' mother from time to time to ease her pain. Monk Ignatius went on to become a spiritual leader and one of the wisest and most respected clerics.

### ***C.52 Be alert***

Be alert and aware of your surroundings, make sure you don't drift in calm or rough waters onto the land of abandoned dreams. Pay attention to the shallows and unseen riffs (Jackson Browne.)

A Dean of Sciences had plenty of time to contemplate his career and life during a long return from a fund-raising campaign. It suddenly occurred to him that, without truly realizing, he transitioned from a dedicated international graduate student, to a respected scholar and author, to an eager administrator with unhinged ambitions whose first order of business each morning is to tweet to the alumni his faculty's accomplishments, true or perceived and always exaggerated.

The realization that he cannot possibly return to his roots by by rededicating himself to educational, scholarly, or clinical research – write a textbook, solve differential equations, or help cure a disease – was particularly overwhelming. The Dean's assistant observed a profound sadness in the Dean's eyes.

### ***C.53 Respect the adjuncts***

A poorly paid adjunct professor accepted a job on a campus with shortage of affordable housing. Landlords require an outrageous non-refundable application fee in addition to “first, last, and security deposit” which amounts to several thousand dollars for a moldy and roach-infested apartment. Unfortunately, since most landlords also double as faculty members, the university has no interest in enforcing fair housing practices.

The adjunct professor ended up renting a room at the basement of her Department Head who still required a letter of employment from his own department to satisfy insurance requirements, in addition to first, last, and security deposit. The Department Head saw no conflict of interest in this practice and continued renting his basement to adjunct professors, graduate students, and large groups of undergraduate students who were taking his class.

### ***C.54 Do not set out for the land of no-return***

A professor who decides to pursue the administrative path typically envisions life as an administrator as getting up in the morning, wearing nice clothes, and attending a chain of pleasant meetings interrupted by nice lunches and dinners where he/she *will* be heard. Most important, the professor envisions plenty of opportunity to wield power, mandate creativity, and make decisions that affect the life and welfare of others.

The professor does not realize that his/her decision will take him/her and his/her loved ones for a long ride on a broken bus, increasingly bitter and frustrated in pursuit of further authority in a higher, better-paid, and more powerful position. His/her academic skills will fade away within a few months and his/her personality and character will degrade. In a crisis, the professor-turned-administrator will respond in a cowardly way, shielded by a team of counselors who specialize in gaming a broken system.

### ***C.55 Things are not always as they appear***

Due to a scheduling conflict, Professor A had to wait for half an hour outside his classroom until the end of the previous class. Curiosity led him into the adjacent auditorium where Professor B of political science was delivering a lecture on *Roe v. Wade*. The lecture was so brilliant that Professor A would have paid a high price for admission.

Much to Professor A's astonishment, when he googled the great Professor B, he found that his student evaluations were hardly impressive and was not considered a particularly good teacher or valued by his institution.

Who are you going to believe? your own eyes and ears, or what is found on record?

### ***C.56 Decide what is important for you***

A young brilliant professor was awarded numerous deserving honors and grants in his first year on the faculty. He quit his position in the third year despite accelerated tenure proceedings and other enticements to help his wife set up a law practice in a different part of the country. The practice was dedicated to seeking justice for the poor, the wronged, and the destitute.

### ***C.57 If you are not qualified for a job, do not apply for, or accept the job***

Being a professor requires a lifetime of creativity in a chosen field of study, which is a gift that must be endowed and cannot be acquired.

Everyone is naturally creative in some areas that he/she must pursue or discover, but not everyone has the talent to be a backup singer for Neil Diamond or Celine Dion. Be proud that you have the courage to face your strengths and weaknesses.

Think hard and decide if you are prepared to make a life-long com-

mitment before accepting a job that requires an inordinate amount of dedication, resolve, and creativity. Find your own place on earth and the personal or professional environment that makes you most happy.

### *C.58 Do not make false assumptions*

A professor saved her money for many years to buy a new car with all-wheel drive so that she can negotiate the inclement weather of the Northeast. She treated herself to a few extra features, such as heated mirrors and leather seats (pleather.)

Her new car was vandalized on the first day she drove it by a group that did not appreciate those who drive seemingly expensive cars (elite class.) The professor's insurance did not cover the damages and the car had to be traded-in for an older model, inferior to what the professor used to drive.

Do not ridicule or make pejorative comments about a middle-aged person who drives a fancy red convertible car.

### *C.59 Life in the Ivy Tower*

Professors are often ridiculed for living in Ivy Towers. In fact, most professors live in small apartments and modest houses while getting paid for nine months, even though most of them work all year, weekends, and holidays.

Talented and skilled professors of engineering can double or triple their salaries by getting a job in industry, by joining a consulting firm, a venture capital firm, or a Wall Street firm. Most of these professors feel that they have a more meaningful existence punctuated by intellectual challenges and contributions to the society in academe.

In spite of the singular expertise and accumulated wisdom of most professors, pundits feel that are qualified to converse with them on equal grounds and contradict them if the pundit opinions are not consistent

with the expert opinions. However, when a scientific discovery crosses into the boundary of popular science or science fiction, pundits are quick to make futuristic predictions based on findings and ideas they do not truly understand in order to impress the audience.

### *C.60 Do not double dip*

Managers and upper-level engineers who have built their career in industry are routinely interested in getting an academic position as they approach retirement. They expect, among other things, that the academic position will offer them credentials that will help them reaffirm themselves and continue receiving high income thanks to consulting activity on top of a high salary.

A slight miscalculation is that such people are typically unable to read and write research papers, select and recommend textbooks, understand scholarly work, teach, or supervise graduate students; when they teach, they use PowerPoint. There is a special place for such people. in the higher-education sector of Dante's Inferno.

### *C.61 How to prove a theorem*

A professor worked for two straight weeks to prove an important theorem in relativistics. He skipped meals and showers and slept only for a couple of hours each night. On his way home from the office late on a Saturday evening, the professor stopped by a grocery store to pick up some yogurt and bread for dinner in his sparsely furnished apartment. The professor noticed with curiosity that most customers in the grocery store were smiling at him sympathetically as he was pushing his shopping cart through the aisles.

As the professor was checking out at the cashier, the store manager approached him and offered him the yogurt and bread for free, a place for him to sleep at the back of the store at night, and a job unloading the lettuce delivery truck in the morning. The professor thanked her for her kindness and politely declined.



The theorem was proven in a scientific epiphany at 2:00 am the very same night.

### *C.62 A college or university is a place of learning*

A helicopter parent demanded that a university not only educates, but also secures a well-paying job for their child in a specific geographical area. The Department Head admitted that the parent's demand is consistent with promises made by the university during recruitment season where the client-server model of higher education was affirmed. However, the Department Head could not recall the precise time when the university turned from a place of learning to a place of corporate business.

The Department Head expressed her concerns to the Dean in a meeting where everyone else was busy checking texting their stock broker. The Department Head's position was eliminated and replaced with Virtual Head software when the online-course model was implemented. Research has shown that a much higher number of students complete successfully a physical course than an online course, despite the inconvenience of physical appearance. The reasons are not entirely clear.

### *C.63 Good humor lies in the eyes of the beholder*

An insensitive remark made under the guise of *good humor* can be traced to an underlying frustration, aggression, disrespect, or discrimination. If the tables were turned, the offender would have been highly offended. Always put yourself in the position of others and think before you speak or send texts and emails.

### *C.64 Accept and embrace your scars*

When wounds heal, the scars become part of your psyche. Accept the scars and embrace them as reminders of a tough fight.

### *C.65 Pay attention to peoples' character, less attention to ideas*

A person whose lifestyle, actions, and methods are not consistent with their ideas is a con artist. A person whose lifestyle, actions, and methods are consistent with their lifestyle is authentic; never mind the ideas. Evaluate a person in terms of authenticity, not in terms of presentation.

### *C.66 Leader v. leader*

A leader should not be confused with someone who possesses the minimum intellectual capacity to understand concepts and ideas or with someone who, by a fortuitous chain of events, was endowed with the means and opportunity to wield power. Many professors and university administrators possess the minimum intellectual capacity, while the vast majority of any population is capable of understanding concepts and ideas generated by others. The entirety of any population is capable of wielding bestowed power.

The qualities of a real leader are encapsulated in the fictitious characters of James T. Kirk and Jean-Luke Picard. If you think you are a leader, watch some old episodes of Star Trek and see if you can make decisions in the best interest of their crew and the Enterprise.

### *C.67 Some things are incompatible*

Worshipping God or proclaiming to be a true scholar while being interested in living the good life by taking advantage of other people's hard work and good ideas are inconsistent. Do not fool yourself that you can simultaneously serve two masters. Do not be fooled by false prophets.

### *C.68 Distill your decisions*

Subject any pending decision to a chain of questioning in order to assess its overall merits: does the decision make anyone unhappy? does it

infringe on animal welfare and rights? is it consistent with the good of the society at large? does it interfere with the good of the Universe? will it erode your morals or ethics and will it possibly degrade your character?

Take as much time as necessary to find the balance and do not rush into making a decision. Go ahead only after you feel comfortable that the answers provide you with a clear consensus.

### ***C.69 Respect the fainting goats***

Like fainting goats, gentle souls are adverse to conflict and actions leading to emotional carnage. Respect and admire these gentle souls. There are enough ilks of aggressive carnivores to fight amongst themselves in the plains.

### ***C.70 Being happy is simple***

Kazantzakis by way of Zorba the Greek:

*"This is true happiness: to have no ambition and to work like a work horse as if you had every ambition. To live far from men, not to need them, and yet to love them. To have the stars above, the land to your left and the sea to your right and to realize all of a sudden that in your heart, life has accomplished its final miracle: it has become a fairy tale."*

*"I felt once more how simple and frugal a thing is happiness: a glass of wine, a roast chestnut, a wretched little brazier, the sound of the sea. Nothing else."*

### ***C.71 Even if nobody else knows, you know***

From Walter Isaacsons' biography of Steve Jobs: *"It was important, (Steve Jobs') father said, to craft the backs of cabinets and fences properly, even though they were hidden."*

Even if nobody else knows that the backside is rough, *you* will know every time you look at the furniture.

### ***C.72 Set as a goal to become self-sufficient***

Make a plan to become self-sufficient, self-reliant, and self-confident, socially, financially, professionally, and emotionally. If perks, assistance, and affirmation are offered by others, dismiss them or think hard and decide if you want to accept them.

No perk or affirmation ever comes without an emotional or ethical price tag. Those who offer assistance and perks will surely want, or have already received, something in return in the past, current, or due time.

### ***C.73 No good deed goes unpunished***

Irwin and Horne (Irwin K. & Horne C. (2013) A normative explanation of antisocial punishment. *Soc. Sci. Res.* **42**, 562–570) presented strong evidence that no good deed goes unpunished:

*"While much research shows that people punish free-riders, recent studies find evidence that people also engage in antisocial punishment. That is, they sometimes punish those who contribute generously to collective actions. Such sanctioning is puzzling because generous individuals increase the welfare of all group members. When and why are such individuals punished?"*

### ***C.74 Ponder how you see yourself in the world***

Take an inventory of the ways you see yourself in the world: fit, misfit, content, wronged, grateful, angry, under-appreciated, lucky, misfortunate, victimized, fortunate.

Once you regard yourself in a negative way, most things collapse around you and your determination to overcome and move on dimin-

ishes. Regard tomorrow as the first day of the rest your life. Find ways of maintaining your mental strength, make a concerted effort to compartmentalize and eliminate one-by-one your worries, and be grateful for the blessings.

### ***C.75 Prepare yourself for the truth***

There is a point in life where all a person cares about is what is right, what is wrong, what is good, what is bad, what is false, and what is true.

Some people reach this point earlier than others, some reach it early in adulthood, some reach it late in their lives, and some never do. Few people are able to get through the tunnel of truth and come out emotionally intact at the far end.

Prepare yourself for the time when the smoke diffuses, mirrors disappear, and you start suspecting and finally seeing the naked truth.

### ***C.76 Do not accept the first thing that comes along***

In our search for meaning, reason, and purpose, we accept the first reasonable thing that comes along, thereby running the risk of dismissing the most compelling thing that may come at a later time.

### ***C.77 The real reason that your unpleasant neighbor never sees you***

A profound theorem in probability theory states that *two mutually exclusive events cannot be independent, while two independent events cannot be mutually exclusive*. This explains why an unpleasant neighbor never sees you.

***C.78 Your life belongs to you***

You were not asked if you wanted to be brought in this world, and this is reason enough that your life belongs to you. Not to your parents, not to your family, not to the State, not to anyone else.



# Index

- abbreviations, 7
- abstract, 8
- abstract noun, 17
- accepting a job, 90
- accomplishment, 43
- activity, 43
- administrator, 52
- admiration, 54
- advice, 61
- aggressive, 56
- alert, 88
- apostrophe, 5
  
- because of the fact, 4
- being important, 40
- boiling frog, 73
- book writing, 32, 48
- Boy Scouts, 76
- bullying, 79
- bus, 89
  
- canned codes, 47
- capitalization, 7
- caustic remark, 22
- celebrity, 46
- Center, 51
- character, 94
- charisma, 73
  
- charm, 73
- citations
  - coercive, 20
  - gratuitous, 20
- cliché, 19
- coauthorship, 30
- coercive coauthors, 32
- colon, 2, 3
- complaining, 51
- Conclusion, 21
- confidant, 80
- copy editing, 29
- criticism, 27, 31, 59
- cruelty, 11, 12
- cut and paste, 33
  
- dash, 24
- David Brooks, 69
- debate, 82
- decisions, 94
- denial, 82
- despite the fact, 4
- devil, 62
- discrimination, 81
- double dash, 24
- double dip, 92
- downloaders, 75
- downtime, 43



- dvi, 36
- earth-shattering papers, 33
- either–or, 11
- Elements of Style, 1
- en dash, 24
- enumerative and, or, but, 6
- epichairekakia, 82
- ethical, 69
- eulogy virtues, 69
- facts, 36
- fainting goats, 95
- false assumptions, 91
- feeling crummy, 72
- fixing sentences, 26
- flattery, 55
- forgiveness, 82
- forgotten professor, 83
- free-lancing, 47
- friend, 80
- frog, 73
- functional fixedness, 39
- generous, 73
- gentle souls, 95
- giver, 75
- gold, 35
- good deed, 96
- good ideas, 35
- good people, 68
- grain of salt, 20
- grammatical structures, 15
- grant, 46
- grateful, 52
- gratitude, 87
- habituation, 68
- hands down, 19
- happy, 95
- Heinz dilemma, 39
- helicopter parent, 93
- hero, 70
- hiring committee, 60
- honest, 69
- honorary coauthors, 32
- honors and awards, 50
- humble, 64
- humor, 85, 93
- hyperbole, 11, 12
- hyphen, 16
- hyphenation, 16
- impact, 37
- improvement, 68
- in spite of the fact, 4
- including, 2
- indie, 75
- inflection, 71
- inner expert, 80
- institution types, 56
- interdisciplinary endeavors, 35
- interlude, 19
- Internet, 7
- intimidation, 79
- Introduction, 8, 18
- Ivy Tower, 91
- journalism, 25
- judgment, 59
- Kazantzakis, 95

- latex, 36
- Latin element, 11
- lazy, 78
- leader, 94
- learning, 74, 75
- legacy, 86
- legalese, 10
- letter of reference, 60
- Linux, 65
- literal, 23
- literally, 24
- literature, 25
- long dash, 24
- manipulator, 71
- max-three principle, 6
- meek, 64
- meraki, 77
- metacognition, 82
- minimalist, 44
- modesty, 49
- morals, 72
- mudita, 82
- neither–nor, 11
- non-prolific author, 31
- pancake sort, 65
- paper, 61
  - splitting, 13
  - writing, 33
- paragraph, 6
- paragraph length, 6
- parallel structure, 10
- passive voice, 8
- passive-aggressive, 58
- patience, 97
- performing art, 44
- personal questions, 76
- pivoting, 71
- plagiarism, 33
- pray, 84
- press release, 51
- pretending, 76
- priceless, 74
- prism, 67
- professor
  - forgotten, 83
  - salary, 83
- prolific author, 31
- promise, 36
- proposals, 61
- pyramid scheme, 47
- references, 14, 20, 33
- reframing, 38
- rejected paper, 28, 29, 84
- rejection, 34
- removal test, 7
- respect, 57, 59
- resume accomplishments, 69
- reviewers, 28
- ridicule, 68
- ridiculous, 49
- Robert Frost, 17
- Roe v. Wade, 90
- sacrificial lamb, 69
- scars, 93
- schadenfreude, 82
- self-sufficient, 96

- semicolon, 3
- seminar, 44, 45
- sentence fixing, 26
- Shawshank redemption, 31
- short-changed, 54
- skills, 41
- small talk, 76
- smart, 38
- sociopath, 70
- sources, 33
- spell checker, 21
- staff, 61
- Stephen King, 31
- Steve Jobs, 95
- subject–verb–object, 9
- such as, 2
- suggest, 5
- superlatives, 23
- supervising students, 55
- survivor's guilt, 50
- symbols, 23
- taker, 75
- technical concepts, 12
- theorem, 92
- thermometer, 73
- thick skin, 30
- thinking, 42
- thinking outside the box, 38
- throw under the bus, 81
- tool, 47
- tough love, 55
- truth, 97
- two weeks, 68
- Ubuntu, 65
- uploaders, 75
- Waldeinsamkeit, 77
- world, 96
- writing
  - while learning, 13
- wrong answer, 79
- zero-sum game, 78





# *Grasshopper's Compendium*

*C. Pozrikidis*

The author collected in this little book grammatical and stylistic advice, established and subjective writing procedures and rules, and miscellaneous commentary, observations, thoughts and truths. The intended audience includes students, professors, researchers, and anyone interested in the modern world of research and academe or else seeking behavioral guidelines.

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