

Taking Care of Widows & Orphans

Designing Beautiful Book Interiors

Dave Schroeder

<http://www.daveschroeder.com/bookdesign.pdf>

Who is Dave Schroeder?



- Author of the Xenotech Support science fiction humor series
- Owner of Spiral Arm Press
- Former Chief Information Officer
- Active member of the Atlanta Radio Theatre Company
- Book designer for Spiral Arm Press



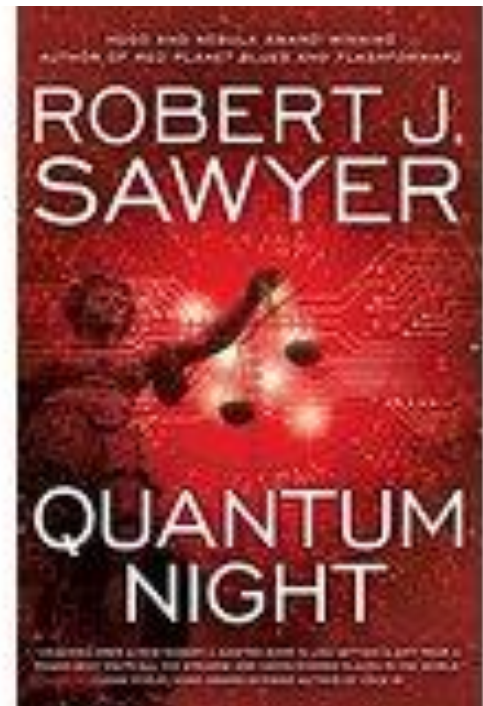
Overview

- Where to look for inspiration
- Parts of a book's interior
- Physical dimensions & margins
- Fonts and font size
- Line length
- Line spacing or leading
- Chapter heading style
- Running heads and page numbers
- Indents and first paragraphs
- Typography: periods, quotes, dashes
- Fixing widows and orphans

Inspiration: Learn from the Best

Find high quality, professionally published books in your genre and see how *they* handle...

- Body copy and other typefaces
- Leading and paragraph indents
- Running heads
- Margins
- Chapter titles
- Introductory quotations
- Illustrations
- Frontmatter
- Backmatter



Parts of a Book's Interior

Frontmatter

- Other works
- Half title
- Frontispiece
- Title page
- Copyright page
- Dedication
- Epigraph
- Table of Contents
- List of Figures
- List of Tables
- Forward
- Preface
- Acknowledgements
- Introduction
- Prologue
- Second Half Title

Body

- Part Opening page
- Chapter Opening page
- Body Pages
- Epilogue
- Afterword
- Conclusion

Backmatter

- Postscript
- Appendix or Addendum
- Chronology
- Notes
- Glossary
- Bibliography
- List of Contributors
- Index
- Errata
- Colophon
- Invitation to connect

Physical Dimensions

Createspace.com offers several industry standard trim sizes:

5 x 8 inches

5.06 x 7.81 inches

5.25 x 8 inches

5.5 x 8.5 inches

6 x 9 inches

6.14 x 9.21 inches

6.69 x 9.61 inches

7 x 10 inches

7.44 x 9.69 inches

7.5 x 9.25 inches

8 x 10 inches

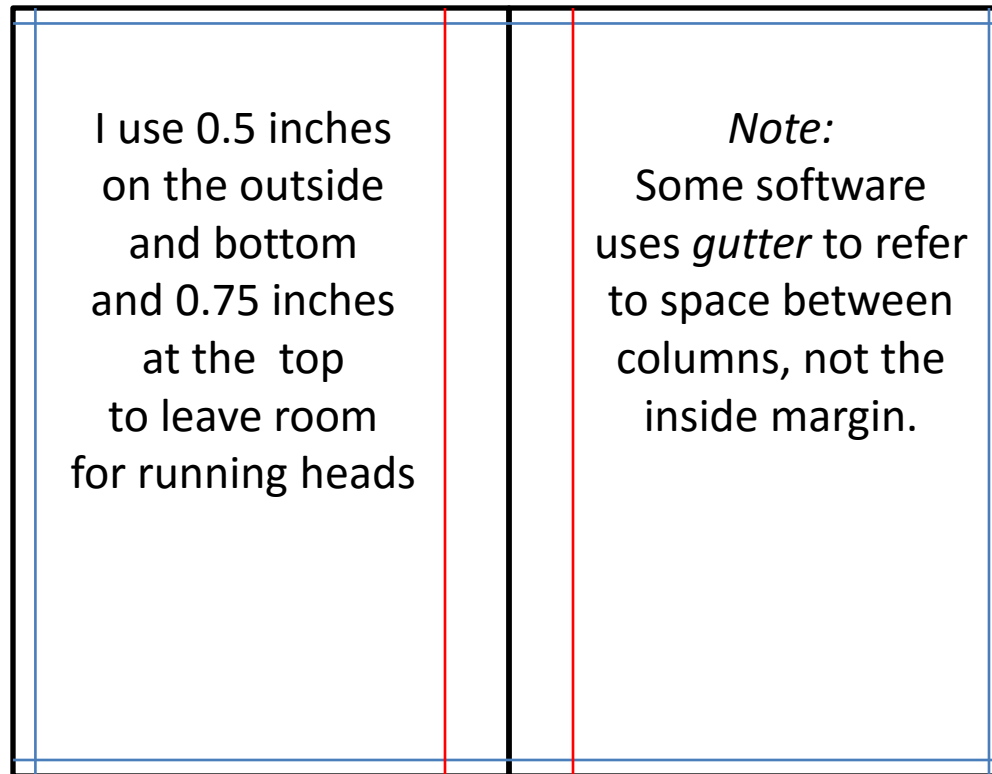
8.5 x 11 inches

Because mass market paperbacks are approximately 4 x 7 inches, I recommend using the 5x8 trim size whenever it fits your work.

Mass market and print-on-demand paperbacks are produced using different equipment, which is why print-on-demand services don't typically offer 4x7 dimensions.

Margins

Leave at least 0.25 inches of margin around the outer edge



The inside margin or gutter will vary depending on the number of pages in your finished manuscript.

How Many Pages in My Book?

That's a great question. The answer is complicated and depends on a number of factors:

- Word count
- Book dimensions (trim size) and margins
- Typeface and type size
- Chapter title style and number of chapters
- Leading (space between lines)
- Space between paragraphs
- Tracking (increased or decreased letter spacing)
- Illustrations
- Frontmatter and Backmatter
- Random elements, like space left at end of chapters

**It's at least
a two-step
process...**

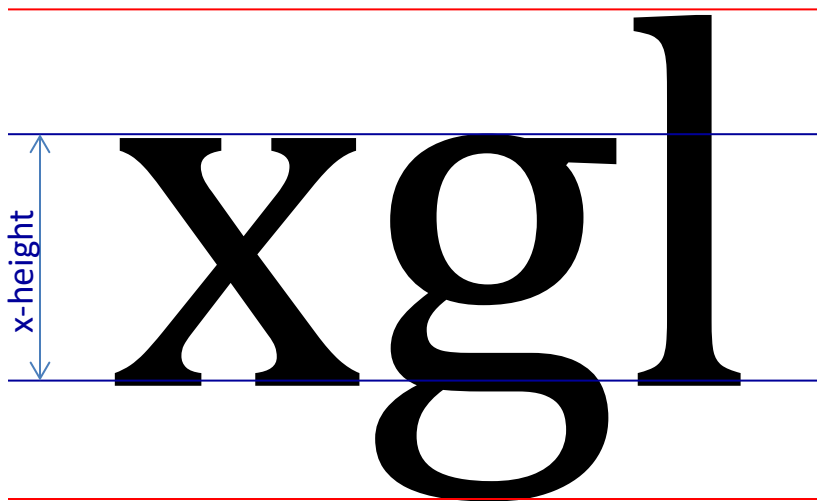
Page Count Examples

All my novels are 5x8 trim size using 0.125 inch paragraph indents and Adobe Garamond Professional 11.5 point with 13.8 leading

Xenotech Rising	Xenotech Queen's Gambit	Xenotech What Happens
105,000 words	117,000 words	102,000 words
34 chapters	42 chapters	43 chapters
320	390	350
finished pages	finished pages	finished pages
0.625 inside margin	0.675 inside margin	0.625 inside margin

The top margins were uniformly set at 0.75 inches to provide room for running heads and the bottom and outside margins were 0.5 inches.

Typeface Properties



Typefaces can take up different amounts of space vertically *and* horizontally.

Try different fonts to see the effect a given font has on the number of pages in your finished interior.

Top Body Copy Typefaces

- **Garamond**
- **Jenson**
- **Caslon**
- **Bembo**
- **Electra**
- **Minion Pro**
- **Hoefler Text**
- **Sabon**
- **Century**
- **Georgia**

Many of these typefaces have been in use for centuries and have demonstrated their clarity and readability.

Use serif faces for book interiors, with sans serif faces reserved for chapter headings and other special functions.

Note: Some typefaces take up more room than others, increasing your page counts.

Font Size and Leading

TOO LITTLE LEADING

Cambria 12pt with 12pt leading

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us -- that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion -- that we here highly resolve that these dead shall not have died in vain -- that this nation, under God, shall have a new birth of freedom -- and that government of the people, by the people, for the people, shall not perish from the earth.

Font Size and Leading

TOO MUCH LEADING

Cambria 10.5pt with 18pt leading

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate—we can not consecrate—we can not hallow—this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us—that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion—that we here highly resolve that these dead shall not have died in vain—that this nation, under God, shall have a new birth of freedom—and that government of the people, by the people, for the people, shall not perish from the earth.

Font Size and Leading

JUST RIGHT

Cambria 11.5pt with 13.8pt leading

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war, testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate -- we can not consecrate -- we can not hallow -- this ground. The brave men, living and dead, who struggled here, have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us -- that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion -- that we here highly resolve that these dead shall not have died in vain -- that this nation, under God, shall have a new birth of freedom -- and that government of the people, by the people, for the people, shall not perish from the earth.

Guidelines for Leading

Here are some basic guidelines for determining leading:

- The optimal line spacing for most text is between 120% and 145% of the font height.
- The longer the line length, the more leading you need.
- Smaller fonts need more leading so it's easier to tell where the next line starts.

Font Size	Low	High
10.0	12.0	14.5
11.0	13.2	16.0
11.5	13.8	16.7
12.0	14.4	17.4

Line Length

- Optimum line length depends on font size
- Too many words on a line decreases readability
- Narrower pages call for smaller fonts & vice versa
- Plan for line lengths of approximately 8-12 words

5x8 Book Garamond 11.5pt

“You printed *how many* copies?”

“A hundred thousand,” said Mike, the fab operator. Over the phone he sounded like a man dangling from a fraying rope above a pit full of cobras and coral snakes.

“Let me guess,” I said. “You had the exponent-lock key down?”

“Uh huh,” said Mike. “By accident. And hitting the cancel key doesn’t do anything. I even pulled the plug but it’s still going.”

“What were you fabbing?”

“Rabbots,” Mike nearly sobbed. “More of them every second.”

“I’ll be right there.”

I grabbed my backpack tool bag and headed for the door.

“Hang on, Mike! The cavalry’s coming—but for dog’s sake, don’t turn them on!”

6x9 Book Garamond 12pt

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Chapter Styles and Running Heads

- Running heads help readers know where they are and what they're reading
- Often have title on right / author on left, but this can vary based on specific requirements
- Should have page numbers in running heads
- Styles for the first page in each chapter can vary widely, but should *not* have running heads above them, just page numbers below
- No indent for first paragraph in a chapter

An Example from 1632

From the 2001 Mass Market Paperback Edition

Chapter Heading
with decorative font
and page number
at the bottom

Chapter 1

No Indent for First Paragraph

"I'm sorry about my parents, Mike." Tom gave the two people in question a look of resentment. "I'd hoped—" He broke off, sighing faintly. "I'm sorry, I really am. You spent a lot of money on all this."

Mike Stearns followed his gaze. Tom Simpson's mother and father were standing near the far wall of the cafeteria, some fifty feet away. Their postures were stiff; their faces, sour. Their very expensive clothing was worn like suits of armor. They were holding the cups of punch in their hands by thumb and forefinger, as if determined to make as little contact with the surrounding festivities as possible.

Mike repressed a smile. *Ah, yes. The dignitaries from civilization, maintaining their savoir faire among the cannibals. They'll hold a cup of blood, but damned if they'll drink it.*

"Don't worry about it, Tom," he said softly. Mike's eyes moved away from the haughty couple against the wall and surveyed the crowd. The gaze was filled with satisfaction.

The cafeteria was a very large room. The utilitarian gray and cream walls had been festooned with an abundance of decorations, which made up in cheerfulness and festive abandon whatever they lacked in subdued good taste. Many

Left Running Head

of the cafeteria's plastic chairs had been moved against the walls, providing a bright orange contrast—those few of them that were not holding someone. Long tables ranged near the kitchen were laden with food and drink.

There was no caviar, and no champagne. But the crowd which packed the room wouldn't have enjoyed the first—*fish eggs, yuck!*—and the second was prohibited by high-school regulations. Mike was not concerned. He knew his folk. They would enjoy the simple fare which was piled on the tables, thank you, even if it *was* beneath the contempt of wealthy urban sophisticates. That was true of the adults, even, much less the horde of children swarming all over the place.

Mike gave the younger man standing at his side a little pat on the shoulder. It was like patting a slab of beef. Tom was the first-string nose guard for West Virginia University's varsity squad, and looked the part. "My sister married you, not your parents."

Tom scowled. "Doesn't matter. They could at least— Why did they even bother to show up at my wedding, if they were going to act like this?"

Mike glanced at him. For all Tom's immense size, Mike didn't have to look up. Tom was barely over six feet tall, about Mike's own height, even if he outweighed him by a good hundred pounds.

Tom was back to glaring at his parents. His own face was as stiff as theirs. Unobserved, Mike studied his new brother-in-law.

Very new brother-in-law. The wedding had been held not two hours earlier, in a small church less than a mile away from the high school. Tom's parents had been just as haughtily rude at the church as they were being now at the reception. *Their* son should have been married in a properly discreet ceremony in a proper Episcopalian *cathedral*, not—not—

This yahoo preacher! In this yahoo—shack!

Mike and his sister had abandoned the stark faith of their ancestors in favor of quiet agnosticism. Years ago, in Mike's case. But neither of them had even once considered having Rita married anywhere else. The pastor was a friend of the family, as his father and ~~grand~~father had been before

Right Running Head

him. The Calvinist fundamentalism of the ceremony had bothered them not in the least. Mike choked down a laugh. If nothing else, it had been worth it just to see the way the pastor's fire and brimstone had caused obvious constipation in Tom's sophisticated parents.

His humor faded quickly. Mike could sense the pain lurking within Tom's eyes. An old pain, he thought. The dull, never-ending ache of a man whose father had disapproved of him since he was a small boy.

Tom had been born into one of the wealthiest families in Pittsburgh. His mother was old Eastern money. His father, John Chandler Simpson, was the chief executive officer of a large petrochemical corporation. John Simpson liked to brag about having worked his way up from the ranks. The boast was typical of the man. Yes, he *had* spent a total of six months on the shop floor, as a foreman, after he retired from the Navy's officer corps. The fact that his father owned the company, however, is what accounted for his later advancement. John Chandler Simpson had fully expected his own son to follow in those well-worn footsteps.

But Tom had never fit his family's mold and expectations. Not when he had been a boy, and not now when he was of age. Mike knew that John Chandler had been furious when his son chose WVU over Carnegie-Mellon—especially given the reason. *Football? You're not even a quarterback!* And both his parents had been well-nigh apoplectic at their son's choice for a wife.

Mike's eyes scanned the room, until they fell on a figure in a wedding dress, laughing at something being said by the young woman at her side. His sister, Rita, sharing quips with one of her bridesmaids.

The contrast between the two girls was striking. The bridesmaid, Sharon, was attractive in a slightly heavy and buxom sort of way. She was very dark complected, even for a black woman. Tom's sister was also pretty, but so slender that she bordered on being downright skinny. And her complexion—very pale skin, freckles, blue eyes, hair almost as black as her brother's—betrayed her own ethnic origins. Typical Appalachian mongrel. The daughter and sister of coal miners.

Note Inside and Narrow Outside Margins

A More Artistic Example

From a 1997 edition of *The Moon Is a Harsh Mistress*

Left Running Head using Italics

Right Running Head using Small Caps

Chapter Name in Italics

That Dinkum Thinkum

Exaggerated Indent and Large Capital for First Paragraph

Chapter Number in Small Caps

I see in *Lunaya Pravda* that Luna City Council has passed on first reading a bill to examine, license, inspect—and tax—public food vendors operating inside municipal pressure. I see also is to be mass meeting tonight to organize “Sons of Revolution” talk-talk.

My old man taught me two things: “Mind own business” and “Always cut cards.” Politics never tempted me. But on Monday 13 May 2075 I was in computer room of Lunar Authority Complex, visiting with computer boss Mike while other machines whispered among themselves. Mike was not official name; I had nicknamed him for Mycroft Holmes, in a story written by Dr. Watson before he founded IBM. This story character would sit and think—and that’s what Mike did. Mike was a fair dinkum

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Robert A. Heinlein

thinkum, sharpest computer you’ll ever meet.

Not fastest. At Bell Labs, Bueno Aires, down Earthside, they’ve got a thinkum a tenth his size which can answer almost before you ask. But matters whether you get answer in microsecond rather than millisecond as long as correct?

Not that Mike would necessarily give right answer; he wasn’t completely honest.

When Mike was installed in Luna, he was pure thinkum, a flexible logic—“High-Optional, Logical, Multi-Evaluating Supervisor, Mark IV, Mod. L”—a HOLMES FOUR. He computed ballistics for pilotless freighters and controlled their catapult. This kept him busy less than one percent of time and Luna Authority never believed in idle hands. They kept hooking hardware into him—decision-action boxes to let him boss other computers, bank on bank of additional memories, more banks of associational neural nets, another tubful of twelve-digit random numbers, a greatly augmented temporary memory. Human brain has around ten-to-the-tenth neurons. By third year Mike had better than one and a half times that number of neuristors.

And woke up.

Am not going to argue whether a machine can “really” be alive, “really” be self-aware. Is a virus self-aware? Nyet. How about oyster? I doubt it. A cat? Almost certainly. A human? Don’t know about you, tovarishch, but I am. Somewhere along evolutionary chain from macromolecule to human brain self-awareness crept in. Psychologists assert it happens automatically whenever a brain acquires certain very high number of associational paths. Can’t see it matters whether paths are protein or platinum.

(“Soul?” Does a dog have a soul? How about cockroach?)

Remember Mike was designed, even before augmented, to answer questions tentatively on insufficient data like you do; that’s “high-optional” and “multi-evaluating” part of name. So Mike started with “free will” and acquired more as he was added to and as he learned—and don’t ask me to define “free will.” If comforts you to think of Mike as simply tossing random numbers in air and switching circuits to match, please do.

By then Mike had voder-vocoder circuits supplementing his

THE MOON IS A HARSH MISTRESS 13

read-outs, print-outs, and decision-action boxes, and could understand not only classic programming but also Loglan and English, and could accept other languages and was doing technical translating—and reading endlessly. But in giving him instructions was safer to use Loglan. If you spoke English, results might be whimsical; multi-valued nature of English gave option circuits too much leeway.

And Mike took on endless new jobs. In May 2075, besides controlling robot traffic and catapult and giving ballistic advice and/or control for manned ships, Mike controlled phone system for all Luna, same for Luna-Terra voice & video, handled air, water, temperature, humidity, and sewage for Luna City, Novy Leningrad, and several smaller warrens (not Hong Kong in Luna), did accounting and payrolls for Luna Authority, and, by lease, same for many firms and banks.

Some logics get nervous breakdowns. Overloaded phone system behaves like frightened child. Mike did not have upsets, acquired sense of humor instead. Low one. If he were a man, you wouldn’t dare stoop over. His idea of thigh-slapper would be to dump you out of bed—or put itch powder in pressure suit.

Not being equipped for that, Mike indulged in phony answers with skewed logic, or pranks like issuing pay cheque to a janitor in Authority’s Luna City office for AS-\$10,000,000,000,000,185.15—last five digits being correct amount. Just a great big overgrown lovable kid who ought to be kicked.

He did that first week in May and I had to troubleshoot. I was a private contractor, not on Authority’s payroll. You see—or perhaps not; times have changed. Back in bad old days many a con served his time, then went on working for Authority in same job, happy to draw wages. But I was born free.

Makes difference. My one grandfather was shipped up from Joburg for armed violence and no work permit, other got transported for subversive activity after Wet Firecracker War. Maternal grandmother claimed she came up in bride ship—but I’ve seen records; she was Peace Corps enrollee (involuntary), which means what you think: juvenile delinquency female type. As she was in

Note Inside and Larger Outside Margins

Running Heads

40

DAVE SCHROEDER

Left

gram after the Pákk-Tigrammath War.”

“That really happened?” I said. “I thought it was just a myth to explain why Tigrammaths are into meditation and the Pákk split into Short and Long factions.”

The two Pákk factions have different views of other intelligent species. Both agree that non-Pákk are sheep to be exploited, but Long Pákk want them for wool and Short Pákk see them as lamb chops.

“It was real,” said Poly. “My adviser, the head researcher on this project, is a Tigrammath. He says the War was so bad that whole planetary populations were destroyed with congruent-tech bombs and massive bio-weapon plagues were unleashed. The Tigrammaths were supposedly the more aggressive of the two species, which is why they try so hard to damp it down and stay chill now.”

“When did all this happen?”

“Professor Urrrson says 15,000 years ago.”

That turned my understanding of GaFTA history upside down. The Galactic Free Trade Association civilizations had crashed during the Pleistocene and had only rebuilt in the last few thousand years? And if the Tigrammaths were originally *more* aggressive than the Pákk, that was saying something. Poly could see my brain going off on a tangent so she leaned forward. The towel wrapped around her gapped suggestively. My hindbrain grabbed my forebrain’s attention and pulled me back into the present.

“Getting back to the composite machine personalities,” I said.

Poly adjusted her towel to reduce my distraction. She kept smiling at me, but her body was telling her to focus on digesting breakfast and getting some sleep. I could tell she’d soon be surrendering to the arms of Morpheus. All-nighters are harder in grad school than in college.

“Our project is using units with five personalities,” she said. “They’re working on ‘greatest good for greatest number’ problems, with the associated dimensions of balancing individual freedom versus public good.”

“I can see how that would drive some of the personalities crazy.”

Right

XENOTECH QUEEN’S GAMBIT

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“Exactly. With our current mix of personality types, we can’t seem to process potential solutions for more than an hour before one of the personalities can’t handle it and goes bonkers.”

“Don’t the other personalities catch it and flag its responses as errors?” I asked.

“No, that’s the problem. They seem to resonate with the off-kilter personality and go nuts themselves.”

“*Quis custodiet ipsos custodes?*”

“Right. Who guards the guardians? The other personalities aren’t evaluating the one that goes off the deep end. They’re jumping in with it,” said Poly.

This was the first time Poly had sounded so frustrated by her Georgia Tech project. I really wanted to be helpful, but didn’t know much about the nuances of her research.

“Tell me about these personalities,” I said. “How do you figure out their intellectual and emotional parameters? How do you decide which types to include in a given consensual matrix?”

“All the A.I. personalities are genius-level intellects,” said Poly. “We usually put two linear thinkers, an emotional unit, an intuitive unit and an artistic unit in a 5-ply matrix. They’re all specialists, with their own approaches to problem solving. We make sure they’re well-adjusted personalities with strong social skills so they can cooperate effectively with each other.”

“Wait,” I said. “You’re using brilliant, genius-level personalities that are well-adjusted and have strong social skills?”

I didn’t think it was *possible* to have true genius-level personalities with strong social skills.

“Of course. How else can they work together effectively?”

“But you still want them to cross-check each other?”

“Of course,” said Poly. “That’s how they gain consensus.”

“I think I see the problem,” I said.

She gave me a “So tell me already...” look.

“You don’t need the personalities to be well-adjusted or have good social skills. You need them to be cantankerous, solitary recluses who don’t care what the other personalities think.”

Chapter 7

“Don’t feed the plants.”

—from *Little Shop of Horrors*,
lyrics by Howard Ashman

Mistress Marigold is a florist. Her retail stores are called Little Shop of Flowers and there are two in the Ad Astra complex, plus nine more at other five star hotels around Atlanta’s upscale Buckhead neighborhood. She specializes in exotic off-planet plants and blossoms, like the Orishen orchids Terrhi had found for me to give to Poly on our first date. The orchids are sensitive to their wearers’ moods and clothing and change color to reflect one and complement the other.

It would have been a short walk across the courtyard to get to the closest Ad Astra flower shop, but getting to Mistress Marigold’s greenhouses required a vehicle. After First Contact, the city of Atlanta had bent over backwards to attract Mistress Marigold here instead of San Diego. It wasn’t because they needed more flower shops—Mistress Marigold was also a renowned xenobotanist and the CEO of a sexy new bio-pharmaceutical company, Marigold Flowers & Pharmaceuticals. Selling flowers was just a synergistic sideline.

The largest part of her enterprise developed an array of plant-based medicines that were as useful against galactic diseases as quinine was against malaria. Their top seller, *Lezbe*, was a fast-acting over-the-counter euphoric and soporific used to treat post-traumatic stress disorders and sleep abnormalities.

The CDC had helped tip the balance thanks to a generous grant to MF&P from the Yu-Obi-Crispos Foundation. CDC researchers wanted to be close to Mistress Marigold so they could work with her on applications for public health. Emory University awarded her a named chair in their botany department. But what really sealed the deal for Mistress Marigold selecting my adopted home city had been proximity to the Atlanta Botanical

Special 

52

Typographical Nuances

Dashes Em Dashes, En Dashes, and Hyphens

Clauses are separated with em dashes:

Don't Use Two Dashes—Use an Em Dash

But, in a larger sense, we can not dedicate--we can not consecrate--we can not hallow--this ground.

But, in a larger sense, we can not dedicate—we can not consecrate—we can not hallow—this ground.

Note that there's no space before and after em dashes.

Typographical Nuances

Hyphens

Hyphens connect things that are close together:

Three-quarters

Half-dead

Toll-free

En Dashes

En dashes connect things related by time or distance:

May–December romance

1942–1945 stage of the war

Pages 27–42

Typographical Nuances

Use Curly Quotes, not Straight Quotes

“Four score and seven years ago...”

“My, isn’t that ‘quaint’”

Use Prime Symbols for Foot and Inch Marks

Cut the board to 3'7"

She stood 5'2" in her stocking feet

Use Apostrophes, not Open Quotes

Class of '05

Back in the '80s **not**

Prohibition was back in the '20s

Typographical Nuances

Don't Underline—*Italicize*

“I loved reading *Ready Player One!*” **not**

“Vonnegut’s Slaughterhouse Five is a real trip!”

Use an Ellipsis, not Three Periods

“Four score and seven years ago...” **not**

“A long time ago in a galaxy far, far away”

Always Use One Space at the End of a Sentence

That’s what I do. I drink and I know things. **not**

You ate *how* many? I don’t believe it.

Note: Software will usually handle the spacing automatically.

Widows and Orphans

40

DAVE SCHROEDER

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Widow



Orphan



Chapter 1

“I fear all we have done is to awaken a sleeping giant and fill him with a terrible resolve.”

— Admiral Isoroku Yamamoto

I woke up to the delightful sound of my partner’s voice whispering my name.

“Jack. Jack. Get up, Jack.”

Consciousness slowly seeped into my brain cells. I reached out an arm to cuddle with Poly, but she wasn’t there.

“Jack. Jack. Earth to Jack.”

It wasn’t Poly. It was my phone using Poly’s voice because that always got my attention.

“Jack, wake up! You’ve got a support call!”

Adrenaline flowed. I sat up quickly, and then realized that wasn’t a good idea. My head reminded me I wasn’t that far past having a concussion, and my ribs reminded me I’d been shot in the chest five times a month and a half ago. Why am I still alive? Bullet-proof vest, of a sort. Long story.

“What time is it?”

“Five-fifteen,” said my phone, apologetically.

“In the morning? Who’s calling at this hour?”

I swung myself around to sit up and noted a sharp, residual pain in my thigh from where I’d been clawed by a dinosaur—the same long story.

“Mike,” said my phone, “from WT&F.”

Widget Technology & Fabrication was one of my clients, or maybe I should say *our* clients, now that I’ve got a partner. I run a tech support company—for alien technology—called Xenotech Support Corporation. Ever since Earth joined the Galactic Free Trade Association there’s been a lot of demand for our services.

“Hi, Mike,” I said. “What is it *this* time? And why are you at work so early?”

Mike was the fab operator at WT&F and a good guy. He ran

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away and cancel their access.

Widow

At some point, I needed to learn whatever I could about the person or group behind the robot. But that could wait. For now, I needed to get a two hundred and fifty foot robot out of sight to avoid potential panic and disruption to the already congested Atlanta rush hour.

Now that I had superuser privileges I could put on the full cybernetic feedback rig and guide the robot with my movements. I unbuckled my safety harness and stood up. Then I donned the encephalo-helmet, stepped into the leg sensors, and slid my arms into the arm harnesses. Once they were all comfortably situated I tried a few experimental movements. I overbalanced a bit and started to fly erratically before getting the robot back into equilibrium. So long as I didn't make any sudden movements, I was safe.

I called up a rear-facing monitor and zoomed in on WT&F's headquarters. Mike was still visible on the roof at maximum magnification. I asked my phone to call him.

"Are you okay?" said Mike when we connected. "I'm glad you didn't hit the pavement."

"I'm pretty happy about that, too."

My phone made a few supportive beeps.

"Who's running that thing, you, or the secret robot masters?" asked Mike.

"Me," I said. "I've got an idea. I'm going to try flying this thing down to the big VIGorish Labs hangar at Hartsfield Port." The hangar was where I'd been shot last month. Fun place.

"That makes sense," said Mike. I could hear his breathing slow to something like normal. Giant robots were terrifying, which is why I needed to get this one out of sight fast.

"Can you drive my van down there and pick me up?"

"Sure."

"I'll talk to J-J about taking the giant robot."

"Great," said Mike. "I'm glad you'll be the one having that conversation, not me."

I had the robot make a giant thumbs up sign, but we were

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"That really happened?" I said. "I thought it was just a myth to explain why Tigrammaths are into meditation and the Pákk split into Short and Long factions."

The two Pákk factions have different views of other intelligent species. Both agree that non-Pákk are sheep to be exploited, but Long Pákk want them for wool and Short Pákk see them as lamb chops.

Orphan

"It was real," said Poly. "My adviser, the head researcher on this project, is a Tigrammath. He says the War was so bad that whole planetary populations were destroyed with congruent-tech bombs and massive bio-weapon plagues were unleashed. The Tigrammaths were supposedly the more aggressive of the two species, which is why they try so hard to damp it down and stay chill now."

"When did all this happen?"

"Professor Urrrson says 15,000 years ago."

That turned my understanding of GaFTA history upside down. The Galactic Free Trade Association civilizations had crashed during the Pleistocene and had only rebuilt in the last few thousand years? And if the Tigrammaths were originally *more* aggressive than the Pákk, that was saying something. Poly could see my brain going off on a tangent so she leaned forward. The towel wrapped around her gapped suggestively. My hindbrain grabbed my forebrain's attention and pulled me back into the present.

"Getting back to the composite machine personalities," I said.

Poly adjusted her towel to reduce my distraction. She kept smiling at me, but her body was telling her to focus on digesting breakfast and getting some sleep. I could tell she'd soon be surrendering to the arms of Morpheus. All-nighters are harder in grad school than in college.

"Our project is using units with five personalities," she said. "They're working on 'greatest good for greatest number' problems, with the associated dimensions of balancing individual freedom versus public good."

"I can see how that would drive some of the personalities crazy."

There's disagreement over the exact definition of widows and an orphan, but whatever they're called, good typographic practice strives to eliminate them.

Advice for Copyfitting

I've found the following copyfitting advice helpful...

- Don't start until *all* your text edits are complete
- Always work from front to back
- Use *tracking* to expand or contract text to remove widows and orphans
- You may need to modify tracking on paragraphs several up from your widows and orphans
- Always review to confirm you haven't created *new* widows and orphans when fixing others
- As a last resort, change the text itself

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