

Grantville Gazette Volume XXI

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Grantville Gazette, Volume 21

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What is this? About the Grantville Gazette

Written by Grantville Gazette Staff

The *Grantville Gazette* originated as a by-product of the ongoing and very active discussions which take place concerning the 1632 universe Eric Flint created in the novels *1632*, *1633* and *1634: The Galileo Affair* (the latter two books co-authored by David Weber and Andrew Dennis, respectively). This discussion is centered in three of the conferences in Baen's Bar, the discussion area of Baen Books' web site. The conferences are entitled "1632 Slush," "1632 Slush Comments" and "1632 Tech Manual." They have been in operation for almost seven years now, during which time nearly two hundred thousand posts have been made by hundreds of participants.

Soon enough, the discussion began generating so-called "fanfic," stories written in the setting by fans of the series. A number of those were good enough to be published professionally. And, indeed, a number of them were—as part of the anthology *Ring of Fire*, which was published by Baen Books in January, 2004. (*Ring of Fire* also includes stories written by established authors such as Eric Flint himself, as well as David Weber, Mercedes Lackey, Dave Freer, K.D. Wentworth and S.L. Viehl.)

The decision to publish the *Ring of Fire* anthology triggered the writing of still more fanfic, even after submissions to the anthology were closed. *Ring of Fire* has been selling quite well since it came out, and a second anthology similar to it was published late in 2007. Another, *Ring of Fire III*, is forthcoming. It will also contain stories written by new writers, as well as professionals. But, in the meantime . . . the fanfic kept getting written, and people kept nudging Eric—well, pestering Eric—to give them feedback on their stories.

Hence . . . the *Grantville Gazette*. Once he realized how many stories were being written—a number of them of publishable quality—he raised with Jim Baen the idea of producing an online magazine which would pay for fiction and nonfiction articles set in the 1632 universe and would be sold through Baen Books' Websubscriptions service. Jim was willing to try it, to see what happened.

As it turned out, the first issue of the electronic magazine sold well enough to make continuing the magazine a financially self-sustaining operation. Since then, even more volumes have been electronically published through the Baen Webscriptions site. As well, *Grantville Gazette*, *Volume One* was published in paperback in November of 2004. That has since been followed by hardcover editions of *Grantville Gazette*, Volumes Two, Three and Four.

Then, two big steps:

First: The magazine had been paying semi-pro rates for the electronic edition, increasing to pro rates upon transition to paper, but one of Eric's goals had long been to increase payments to the authors. *Grantville Gazette*, Volume Eleven is the first volume to pay the authors professional rates.

Second: This on-line version you're reading. The site here at <http://www.grantvillegazette.com> is the electronic version of an ARC, an advance readers copy where you can read the issues as we assemble them. There are stories posted here which won't be coming out in the magazine for more than a year.

How will it work out? Will we be able to continue at this rate? Well, we don't know. That's up to the readers. But we'll be here, continuing the saga, the soap opera, the drama and the comedy just as long as people are willing to read them.

— The *Grantville Gazette* Staff

COLUMNS:

More Cons to Consider

Written by Grantville Gazette Staff

For those of you who are interested and live in the vicinity, Eric Flint is going to be the Guest of Honor at SoonerCon, in Oklahoma City, OK. The con begins on June 5 and ends on June 7, 2009. Their website is: <http://www.soonercon.info/dnn/>.

Rick Boatright, Paula Goodlett, Gorg Huff and possibly a few other regulars will also be attending SoonerCon.

In July, we'll be having our annual 1632 mini-con at Fiestacon/Westercon in Tempe, Arizona. That's Fourth of July weekend—which is only appropriate for an author who invented the Fourth of July Party, isn't it? The website is: <http://www.fiestacon.org/>.

The series got a very nice review, url here: <http://wy.lcms.org/LHP/QBR/2008ChristmasQBR0301.pdf>. We certainly appreciate the very thoughtful consideration we received.

We hope you all had a wonderful holiday season. And here's hoping that 2009 is a really great year!

The *Grantville Gazette* Editorial Board

FICTION:

The Anaconda Project, Episode Nine

Written by Eric Flint

Chapter 9

"I have news," Lukasz Opalinski announced, as soon as his friend Jozef Wojtowicz entered the room which served Opalinski as a combination library and small salon.

Jozef closed the door behind him. "What could be so urgent that I had to drop everything and come here all the way from Poznan? Two days it took me, in this horrid weather."

"Oh, that's nonsense. Spring has arrived, you sissy."

"There is *snow* on the ground, Lukasz. And it's *cold*. Especially spending two days on horseback. More than two, in fact. I couldn't make it here by nightfall yesterday and had to spend the night at an inn a few miles away. A very wretched inn. Even the hogs at the place were miserable."

"Well, of course it's cold and there's snow on the ground. We're still in March— *but!* The equinox was four days ago. So we are well into spring."

"And you haven't even offered me a drink yet."



Opalinski waved at a nearby side table, quite heavily laden with bottles of various kinds of liquor. "Help yourself. But when did you start drinking in the morning?"

Wojtowicz took a seat on a chair not far from the divan where Opalinski was lounging. He did so without giving the side table so much as a glance.

"I fear for my chances at beatification," he explained, "should I add excessive drunkenness to my other vices."

"I'd say those chances are so close to non-existent it hardly matters."

"You never know. And I repeat, what is so urgent?" Wojtowicz gave Opalinski's hands a flamboyantly intense scrutiny. Which was perhaps peculiar, since the hands held nothing by a few sheets of paper. "So urgent, I now notice, that apparently *you* haven't been drinking this morning. Despite the fact that your own chances for beatification rank somewhere below Attila the Hun's—albeit, yes, I'll give you this much, higher than that of the average Polish magnate."

His wealthy friend chuckled. "That last witticism is closer to the mark than you realize." He gave the sheets of paper in his hand a little jiggle. "I just got a report from one of the spies I hired at your recommendation—at a frightful cost, I might add."

Wojtowicz shrugged. "Good spies are expensive. There are plenty of cheap spies, of course. If you ever find one who isn't completely useless—and usually a double agent—please let me know. And what does your costly but effective spy tell you?"

"He found out who assassinated Bohdan Chmielnicki. As well as who gave the order."

"As to the last . . . Samuel Laszcz, would be my guess. Failing that, one of those headstrong Radziwills."

"Mine, too—but we'd both have been wrong. No, it was Janusz Tyszkiewicz."

Wojtowicz's eyes widened. "The voivode of Kiev? But . . ."

"Yes, I know. But that suggests involvement by the crown. Given the king's favor to the Catholic church and the fact that Tyszkiewicz is a Catholic partisan."

"Say better, a Catholic fanatic."

Opalinski looked down at the papers in his hand. "But there's more. According to the spy, the plot was the product of a cabal between Tyszkiewicz, Samuel Osinsky—he's the Seneschal of Lithuania, no less—and none other than Jeremy Wisniowiecki."

"Wisniowiecki? He can't be more than twenty-three or twenty-four years old."

"Not even that. He's twenty-two." Opalinski grinned. "A bit young, one would think, for this sort of scheming. But perhaps he drinks in the morning."

Wojtowicz turned his head and spent a few seconds examining a painting hanging on a nearby wall. There was nothing unusual about the painting. It was simply one of many portraits hanging on the many walls of the Opalinski castle at Sierakow. All of them depicted various members of the illustrious family going back several generations.

Some of them had even been illustrious in truth. A goodly number more had been pure wastrels. Being born into one of the great Polish or Lithuanian magnate families automatically gave a young man a political

and military career in the Commonwealth, unless he was an outright mental defective—and provided, of course, that he desired such a career. The same exalted status also gave such young men the opportunity to pass through their entire lives doing absolutely nothing useful and productive, but simply enjoying themselves.

A great many made that choice—and were then, typically, the most vociferous defenders of the rights and privileges of the Commonwealth's nobility. And the most savage when the lower classes presumed to challenge them, or were even too loud in their complaints.

Jozef had disliked the type even as a boy. Partly, perhaps, simply because he did not have their option. As an acknowledged bastard of a great magnate family, he had been given many opportunities and privileges which would have been denied to him had he been a commoner. But, still, he was a bastard. He was allowed to work in fields reserved for the szlachta—but he *was* expected to work.

Being fair to himself, though, Jozef was almost sure that he would have chosen a productive life devoted to the good of the Commonwealth even if he'd been legitimately born. Even, he liked to think, if he'd been born a commoner—although in that case, of course, his options would have been far more limited.

Whatever the reason, he'd entered his manhood with a sharp dislike for noble idlers. The months he'd spent in Grantville had transformed dislike into detestation; contempt into loathing—and aversion into a determination to destroy the lot of them. As a class holding power, if not as individual people.

"And what is so fascinating about my grandfather Jan?" asked Lukasz.

"You've never met them," mused Jozef, still studying the portrait. "Or, if you have, it would only have been one or two individuals."

"You're speaking of the Americans?"

"Yes. I'm sure you've been told that they are a humble folk, once you strip away the veneer of their technical wizardry and power." Wojtowicz chuckled. "That is the biggest lie ever told. They are the most arrogant people you can imagine. So arrogant that they feel no urge to proclaim their superiority over others. They simply take it for granted and go about their business, certain in the knowledge that any American with the birthright of their culture—culture, Lukasz, not blood—is the superior of any noble family, be its blood even royal."



He took a deep, slow breath. "And, in the end, I came to agree with them."

Opalinski's eyes widened a bit. "Oh, surely not."

Wojtowicz turned his head away from the portrait to look at his friend. "Oh, surely yes. First, because it is true—and the truth has been put to the test. Ask yourself a question, Lukasz. Do what the Americans would call a mental experiment. Imagine a similar-sized group of Polish and Lithuanian szlachta—say, the Sejm in full session—which had mysteriously found itself transposed in time and place the way they did. Planted, let us say, in the middle of the Roman Empire during one of its many civil wars. Would they have done as well? Would they even have survived?"

Opalinski pursed his lips. "Survived . . . yes. Many of them, certainly. If nothing else, most szlachta have martial skills, and those are always in demand. And command respect, for that matter."

Jozef scratched his jaw. "I will give you so much. And the rest? Would a few thousand szlachta have shaken the world of Rome the way a few thousand Americans have shaken—even transformed, in many ways—our own world?"

Opalinski thought about it for a while. Then, smiling ruefully, shook his head. "I think not. If nothing else, they would have immediately taken to quarreling."

"Yes, they would. And, to go back to my point, the second reason I came to agree with the Americans was because their viewpoint has the great advantage of not requiring my own abasement. Nothing prevented *me*, I eventually realized, from adopting the same attitude."

Lukasz peered at him, almost owlshly. "You've not struck me as being especially arrogant since your return. No more than usual, at least—and that's just the unfortunate byproduct of the fact that you're smarter than almost everybody else."

He waved his hand magnanimously. "A small enough failing—and I forgave you for it many years ago. But I'll not argue the point any further, since, as you say, I've never met any Americans. Not even one, as it happens."

He sat up a bit straighter. "But we've strayed from the point, Jozef. Yes, that young snot Jeremy

Wisniowiecki is involved. Right in the thick of it, in fact."

"But why would the others involve *him* ? Leaving aside his youth—and in his case; I've met him; the term 'callow youth' is quite appropriate—he's difficult to deal with, by all accounts. Not only arrogant but self-willed to the point of lunacy. The man quarrels constantly, and has done so since he was a boy."

"Well, as to that, I suspect the reason is that he was their connection to the assassins. The leader of whom was a man named Stefan Czarniecki—"

"Never heard of him."

"—and the reason you've never heard of him is that you don't associate with his circles. Neither do I. Neither does almost any respectable man—unless, like young Wisniowiecki, you're the scion of a great family which has used their services in the past."

"Whose services?"

"The Lisowczycy."

Wojtowicz grimaced. "He's one of *them* ? This Stefan Czarniecki was one of Alexander Lisowski's men?"

"So it seems, although he may never have served under Lisowski himself. Lisowski died in October of 1616, and the first record of Czarniecki my spies could uncover was that he fought with the Lisowczycy at the Battle of the White Mountain. That was two years later."

"How old is Czarniecki?"

Lukasz shook his head. "My spies found no records. There may very well be no records. Czarniecki claims to be szlachta, and he's fierce enough that no one is going to contest the matter openly. But no one really seems to believe it, either. From his appearance, my spies estimate that he's somewhere in his middle thirties. No older than forty, certainly."

"Which would make him a bit too young to have fought in the Dymitriads with Lisowski."

Again, Jozef made a face. *The Lisowczycy!*

Even for eastern Europe, with its incessant wars of the past few decades, the Lisowczycy were notorious. Also known as the Straceny, the "lost men," they were a mercenary force of light cavalrymen which had been prominent in the many conflicts in the region for a quarter of a century. Their forces were mostly drawn from the Grand Duchy of Lithuania, but men joined them from all lands in eastern Europe. Their numbers varied, depending on circumstances, anywhere from a few hundred to several thousand.

They were named after Aleksander Jozef Lisowski, a Lithuanian nobleman born sometime around the year 1580. Little was known of his youth. He first came to notice during the Moldavian magnate wars, initially in the camp of Michal Waleczny, then as a supporter of Jan Zamoyski.

In 1604, toward the start of the war with Sweden, the Polish Sejm—not for the first time—neglected to raise the funds to pay its soldiers in Livonia. What followed was one of the so-called *konfederacja*, which were a peculiarly Polish tradition in which what amounted to a mutiny received semi-official status and quasi-legitimacy. Lisowski had been one of the ringleaders.

This *konfederacja* had been more brutal than most. The mutineers decided to recompense themselves by plundering and savaging the local civilians—not caring in the least that many of the civilians in question were Polish subjects. The official response to the mutiny was ineffectual, as was so often true, and not long thereafter Lisowski and his supporters joined the *rokosz* of Mikołaj Zebrzydowski, also known as the Sandomierz Rebellion.

A *rokosz* was another peculiarly Polish institution. What amounted to a rebellion—and would have been regarded as outright treason in most realms—was given semi-official recognition in the Commonwealth. Just one of many ways in which the supremacy of the aristocracy was sanctified, even over the power of the royal family.

The forces of King Zygmunt III eventually triumphed in the ensuing civil war, at the battle of Guzow, although the Vasa dynasty thereafter acquiesced to the pretensions of the nobility. Aleksander Lisowski himself became not much better than an outlaw. Fortunately, like many such rebels and outlaws before him, he found shelter with one of the great magnate families which, for its own reasons, wanted to thumb its nose at the king. In this instance, with the powerful and wealthy Lithuanian Radziwills.

Lisowski's luck had a Russian as well as Lithuanian cast. Muscovy's Time of Troubles had begun, and it wasn't long before Lisowski and his followers were meddling in the Russian lands. He became a partisan of one of the pretenders to the Muscovite throne, the so-called False Dmitry II. In 1608, as the leader of a mercenary force consisting of soldiers of fortune from everywhere in eastern Europe—Poles, Lithuanians, Don Cossacks, Germans, Swedes, Tatars, you name it—he managed to defeat the army of Vasily IV near Zaraysk. Vasily was the legitimate Muscovite heir, insofar as the term "legitimate" applied at all during the Time of Troubles.

From there, Lisowski went on to besiege Moscow itself, but his forces were defeated at Niedzwiedzi Bród and were stripped of most of their loot. Lisowski and his men continued fighting in the ensuing Muscovite wars; sometimes winning, sometimes losing—and always expanding their reputation for brutality and pillage.

Eventually, in 1616, while encamped on the Polish-Muscovite border, Lisowski fell ill and died. His men adopted the name Lisowczycy—"Lisowski's Men"—in his honor, and continued their activities as a mercenary force. They had played an important role fighting for the Austrian emperor in his defeat of the Bohemian Winter King at the Battle of the White Mountain.

"I wouldn't think a scion of the Wisniowiecki family would have direct contact with such adventurers," said Jozef.

Opalinski's lip curled a little. "Most wouldn't. But young Jeremy is said to fancy himself as a terrifying figure on the battlefield. A veritable Achilles, reborn."

"Based on what? If I recall correctly, his military experience is limited to the recent campaign to relieve the Russian siege of Smolensk. In which he did nothing of any note."

"He claims unspecified exploits in the Netherlands, as well."

By now, Jozef's lip was curled as well. "Not bashful, is he?"

"No more than Lucifer. The point being, that it seems Jeremy Wisniowiecki believes that being associated with the Lisowczycy enhances his martial stature."

"In short, he's engaged in what the Americans call 'slumming.'"

At Lukasz's raised eyebrow, Jozef explained the term. He concluded by saying: "But I still don't see what in this news was so urgent that you needed me to come here immediately from Poznan."

Lukasz's eyebrow rose higher still. "No? I would think it was obvious. We must be off, my good and sturdy confederate. Or should I say, 'fellow cabalist'? Perhaps 'companion in conspiracy'?"

"Friend will do just fine," said Jozef, a bit stiffly. "Off where? And when?"

"On the morrow. To Prague, of course, where else?"

Seeing Wojtowicz's frown, Opalinski clapped his hand to his forehead. "Oh, I forgot. The *other* news." He reached into a pocket of his coat and drew forth some more sheets of paper.

"I have a spy in Prague, as well. Even more expensive, this one. And he tells me that Don Morris Roth has already begun the creation of an armaments industry in the city."

Jozef's frown became a glare. "Prague is two hundred miles away. A week's travel even in good weather—which this is certainly not. There is *snow* on the ground, Lukasz. It's *cold*."

"Oh, nonsense. It's not that cold. It's almost April. We'll probably see flowers blooming along the way."

Some subtlety in his friend's expression alerted Jozef. He reviewed in his mind all of Lukasz Opalinski's tendencies, traits and characteristics. And his history.

"There's a woman in Prague," he said accusingly.

Opalinski rose and went to the side table. "It's time for a drink, I think. Surely, afternoon has arrived by now."

"Isn't there? Answer me."

"Well, of course there are women in Prague. It's a big city. One of the biggest in Europe. There must be thousands upon thousands of women residing in the place. Hundreds more, simply there on a visit."

"Lukasz!"



Opalinski turned away from the side table with a drink in each hand. He offered one of them to Jozef. "Oh, stop fussing at me. As it happens, one of those—must be hundreds and hundreds—of women on a visit is Izabela Teczyska. You remember her, I'm sure."

Jozef's glare might have matched Lucifer's, by now. "Of course I remember her. How could I not? Given that you made such a fool of yourself over her, when she and her family came to visit your family last year."

"Stop exaggerating. Perhaps I was a bit over-enthusiastic in my praises of her charms. I can see where that might have bored you."

"I was not bored in the least. How could I have been? When I had to prevent you from precipitating a duel with the Teczynska family's retainers."

"I said, stop exaggerating."

Jozef actually had to control himself from gobbling. "*Exaggerating?* You were as drunk as the proverbial lord and determined to smuggle your way into the private quarters of the lady in question."

"Would have succeeded, too, if it hadn't been for your interference." Smugly: "She was rather taken by me, you know? Told me she'd leave the window unlatched."

"Yes, I know! A duel, as I said. Insofar as a naked man running down the streets with nothing more than a candlestick for a weapon can be said to 'duel' armed retainers of a magnate family. Each and every one of whom was selected for his martial prowess. No better than Lisowczycy themselves, really."

Lukasz's hand was still outstretched, holding the drink. Jozef seized the goblet and drained half the contents in one long swallow.

"Pfah. At least promise me you won't try to smuggle yourself into her quarters, this time."

Lukacs reached back to the table and seized the liquor bottle. "Hold out your goblet," he said. "Have some more. You need it, in this foul weather."

* * *

Some hours later, over dinner, Jozef returned to the question that had puzzled him earlier in the day.

"But what do you really think, Lukasz? It's hard to imagine Janusz Tyszkiewicz being involved in the plot to assassinate Chmielnicki, unless the plot had the tacit approval of the king."

"Which it might well have had, of course." Opalinski shrugged. "There's simply no way to know yet. Keep in mind that there are certain to be several conspiracies underway, by now, most of which—probably all of which—are still fuzzy at the edges and unclear of their precise goals."

"As is our own," muttered Wojtowicz.

"Don't always be so gloomy. The point is that, at this stage, it's perfectly possible that what is eventually bound to become two conspiracies at odds with each other—with knives at each other's throats, more precisely—is still mushed together in a singly very sloppy cabal."

"Those two sharply-defined conspiracies being . . ."

"I'd think it was obvious. There is bound to develop a royalist conspiracy, first of all, determined to abase the pretensions of the nobility and give the crown the same authority it would have in most realms."

Wojtowicz thought about it. "Yes . . . and it'll be strongly pro-Catholic, as well."

That was inevitable, given the Polish Vasa dynasty's allegiance to the church. The rest . . .

Followed just as inevitably. The commitment of Polish and Lithuanian magnates to freedom of religion was more an issue of power than religion, as such. Most of the magnates were Catholic themselves, after all. But some were Protestant—and what was of paramount importance to all magnates, regardless of creed, was their own unquestioned supremacy on their own lands. For that reason alone, they would not accept any state religion that encompassed the whole Commonwealth.

So there would be another faction formed, championing the interests of the great magnates. And it was sure to be at least as rabid as any royalist faction. Probably more so. As a rule, the great magnates of Poland and Lithuania had all of the vices of monarchy and none of its virtues. They demanded, on their own lands, what amounted to the privileges of royalty—but refused, in return, to accept any responsibility for the realm as a whole.

There were some exceptions, of course. Josef's uncle Stanislaw Koniecpolski was one of them. But not many.

"A real mess, isn't it?" said Lukacs.

"And the worst of it," replied Wojtowicz, "is that our own course of action is still so unclear."

"I said. Stop being so gloomy. Some prospects are clear enough, I think."

Jozef scowled. "Yes. Your lust. My maledictions and misericorde."

"Stop it, I say! It's *springtime* , Jozef."

* * *

To be continued . . .

The Anaconda Project, Episode Ten

Written by Eric Flint

Chapter 10

"You're not asking for much, are you, Morris?" said Bernard Fodor. The older of the two Fodor

brothers was doing his best to grumble, but the effort was being undercut by the other members of his family. Not only was his brother Cyril smiling, but his wife was almost laughing.

Not to mention his two kids, Amy and David, both of whom were smiling as broadly as his brother.

"What d'you all think is so damn funny, anyway?" he grouched. "We're talking about completely disrupting our lives. Giving up everything. You'd think there'd be at least one solemn face in the crowd, besides mine."

"Oh, come off it, Dad," said his daughter Amy. The teenager's smile was now an outright grin. "Giving up *what*? A house you've never liked much and never quit griping about? A job you like even less and gripe about even more?"

"Job pays good," he said stoutly.

"Not half as good as Mr. Roth is offering," countered his wife Joanna. "Even leaving aside the fact that you'll have part ownership in the business, which is more'n you got with the rail shop back in Grantville."



Bernard was nothing if not stubborn. "Already got part-ownership in my business with Cyril. *Half*-ownership, in fact, which is more than I'll have in this new outfit Morris wants to set up."

"Oh, for Pete's sake!" said his brother Cyril. "Yeah, sure. You and me each own half of an auto repair and body shop business—which ain't enough to keep either one of us working at it full-time, since the Ring of Fire. Seeing as how your automobile maintenance industry kind of shriveled up and died on the vine, seeing as how there ain't hardly no functioning cars any more."

He nodded toward Morris. "Whereas what he's offering is to set up a major manufacturing facility. *With* a steady and reliable business."

"For at least two years, anyway," said Morris. "After that . . ."

"After that, we're on our own, maybe." Cyril didn't sound disturbed by the possibility. "But even if your war wagon orders dry up completely, so what? By then, if we don't screw up, we'll have by far the biggest and best equipped metal fabrication company in Bohemia. More business is bound to turn up."

General Pappenheim, who'd been silent up till now, cleared his throat. "That's almost a certainty." He gave Roth a thin smile. "Don Morris is too cautious to speak of it directly. But the fact is that the king is bound and determined to develop a munitions and armament industry here in Prague. Even assuming that Don Morris' requirements come to an end—not likely, ha!—there would be other work coming from Wallenstein. Probably even before then, in fact."

He gave the two Fodor brothers a look that could have been described as "hawk-like" without insulting any raptors. "Especially if you can persuade him that there is any future in steam engine vehicles beyond locomotives."

"Sure there is," said Cyril. "It's just blind luck that internal combustion engines back up-time—"

"Lay off, will you?" said Bernard. "Now's not the time for that." He looked at Morris, while rubbing the back of his neck thoughtfully. "One-fourth of the business, right? Shared evenly between me and Cyril."

Morris shrugged. "You and your brother get twenty-five percent of the stock. How you divvy that up between the two of you is your business."

Bernard nodded, still rubbing his neck. "And Larry Monroe gets another twenty-five percent. And you keep half of it."

"That's it. I put up all the capital except for some of the equipment you'll bring here from Grantville. And I handle the wages of the employees for the first two years. You and Cyril and Larry don't have to worry about meeting the payroll for that critical first stretch."

Bernard and Cyril exchanged a glance. That feature of the deal eliminated the single biggest strain on a new business, of course. But the flip side of it was that . . .

"But you do all the hiring, too."

Morris shook his head. "Not all of it, no. The two of you and Larry will do most of hiring of the skilled labor. I'm just handling the unskilled and semi-skilled applicants."

The two Fodor brothers studied him for a moment.

"Which is gonna be about ninety percent of the workforce," pointed out Cyril mildly.

Morris shrugged again. "Look, guys. I made no bones about this at the beginning, and I'm making no bones about it now." He got up from his chair in the big salon and moved toward one of the windows. "Come here. I want to show you something."

As the two brothers got up to follow him, Morris glanced over his shoulder and said: "All of you come over and look. You may as well see what you're getting yourselves into."

The two wives got up also. Those were Joanna, married to Bernard; and Willa, married to Cyril. So did Bernard and Joanna's teenage children, Amy and David.

Cyril and Willa's daughter Lynelle wasn't with them. She and her husband Paul Calagna might wind up moving to Prague also, but they hadn't decided yet. Leaving aside the fact that Paul had a good job with the government, he and Lynelle had five young children to deal with.

The window Morris led them to was just short of enormous. More precisely, since each pane was fairly small, the window was part of what amounted to the seventeenth century equivalent of a bay window looking down from the second floor of the Roth mansion. There was room for everyone to gather around.

"There it is," Morris said. His finger pointed to a mass of buildings just across the street. The buildings

were narrow and pressed right against each other. Perhaps most striking of all was the fact that a wall separated them from the rest of the city.

"The Prague ghetto," Morris said. He sounded rather gloomy. "They still have the wall up along this stretch here. Not because the authorities require it any longer, which they don't, but because a lot of the Jewish inhabitants prefer having the wall."

Young David Fodor was peering at the wall with interest. "I thought Dunash Abrabanel and his guys tore it down."

Morris made a face. "Well, they did—partway. But then a lot of the ghetto's residents raised a fuss and . . . Well, I wound up persuading Dunash that he couldn't just do whatever he wanted high-handedly. So now the whole thing's being wrangled out." His tone got gloomier. "That means involving each and every rabbi in the ghetto. And once you do that, 'wrangling' really means wrangling."

He stepped back from the window. "And that's the issue, from my point of view. One of them, anyway." The gloomy tone left his voice, replaced by something a lot more determined. Even grim. "I am bound and determined to smash up those crusted-over ghetto habits and customs and traditions. And the best way I know of to do that—it's worked everywhere in the world, with every race and creed and color—is to give youngsters the opportunity to earn a good wage while learning some valuable skills. And *not* the same very tightly circumscribed skills that Jews are usually restricted to, in this day and age. I want those kids learning how to *make* things, dammit."

"Especially things that go 'boom,'" said David, grinning again.

Morris smiled back at him. "Well. Yes. That too."

Bernard was back to rubbing his neck. "You want only Jewish employees?"

"No. In fact, I'd much prefer to have an integrated workforce. But . . ." He winced, slightly. "We'll have to see. I'm not sure how many Christian kids will be willing to work for an establishment that has a lot of Jewish employees and refuses to allow any religious discrimination."

Cyril grunted. "I'd say that'll depend mostly on the wages. You pay well enough, there'll be plenty of youngsters willing to thumb their noses at the establishment."

"Well, that's what I'm hoping. We'll see. In the meantime, though, I know for sure I can get as many employees as we need just from the ghetto. If need be."

Seeing Bernard's skeptical look, Morris seemed a bit uncomfortable. "Look. Just 'cause I don't like a lot of those rabbis out there, doesn't mean I dislike all of them. There's a few I get along with, and I've already talked this over with them. They're willing to run interference for me, if I need it."

Cyril spread his hands. "That's your business, the way I figure it." He cocked his head at his brother. "Bernard, are you ready, willing and able to quit dilly-dallying around? Me, I'm for it."

His brother scowled at him. But then, after perhaps three seconds, he nodded. "Yeah, I'm in. What the hell. We'd be crazy not to."

"What I been saying for weeks now." Cyril turned to Pappenheim, who'd remained sitting in his comfortable chair. "I suppose we should get started on the specific requirements you have."

The very tough-looking general's eyes widened. " *Me?* My requirements are a good horse, a good sword and a pair of good pistols. No, no, no. I am simply here out of curiosity. That, and the curiosity of my employer, even more. You need to talk to those two fellows who came here from Vienna with von Mercy."



The count's Bavarian accent was as pronounced as ever, making him just a bit hard to understand. By now, four years after the Ring of Fire, Cyril's German was quite good. But he'd learned that the German language in this day and age was almost more in the way of a cluster of very closely related languages than what you'd call a single and unitary language with various dialects. He was accustomed to the speech of people from Thuringia and Franconia, mostly. He found Germans from other regions often hard to understand, and sometimes downright impossible.

Pappenheim rose from his seat with the fluid grace you'd expect from a man who was not only a famed general but a famed warrior as well. The thought crossed Cyril Fodor's mind—as it had the minds of hundreds of others before him—that Count Gottfried Heinrich Graf zu Pappenheim was a very dangerous man indeed. The vivid scar on his forehead added to the image, of course.

"And now, I am off." He gave the Fodor brothers a grin that had very little humor in it. "We may say that I am about the king's business, I think."

Cyril wasn't sure what to make of that rather cryptic remark. Probably nothing. He was pretty sure that Pappenheim made cryptic remarks simply as a way of keeping the people around him slightly off-balance. Everything the man did had that flavor about it.

* * *

He commented to that effect, after Pappenheim was gone. "He's a little scary, isn't he?"

Morris smiled. "Oddly enough, he's become something in the way of a friend of mine."

All the members of the Fodor family stared at him. Much the way people might stare at a man who claimed to have formed a friendship with a lion. Or a dragon.

Judith Roth chuckled. "It's true, actually. But it doesn't make Pappenheim any less scary. And now, folks, you must all be hungry. Dinner is about to be served."

* * *

"I guess we'll have to get used to eating kosher, huh?" asked Joanna Fodor, about halfway through the meal.

Judith glanced at her husband—who was now looking about as grumpy as Bernard Fodor had, earlier in the day—and chuckled. "Depends."

"On what?"

"Where you decide to live, first and foremost," said Judith. "You'll want to live on this side of the river, of course, given where the factory will be located. But you can find a place in Old Town; you don't need to move into the Jewish quarter. After that, on whether you decide to do your own cooking or hire a cook. I'd strongly recommend hiring a cook, myself—given that you're pretty much going to have to home school your kids for the first year or so."

"Can we get a good cook?" Joanna asked. "At rates we can afford?"

"The cook is likely to be better than you are," said Morris Roth, "given the use of local ingredients. And the rates won't be a problem, with what Bernard'll be making. The key thing is that you have to be strong-willed enough to force a local cook and servants to accept up-time sanitary habits."

Morris was still scowling, but he seemed perhaps a bit less grumpy. "I'll say this much for hiring Jews. The only way they know how to cook is kosher, but in the here and now they're likely to have a lot better sanitary habits than Christians. Meaning no offense."

Joanna shook her head ruefully. Her husband chuckled. "No offense taken," Bernard said. "It can get pretty damn gruesome, I admit."

Cyril's wife Willa spoke up. "Will that be a problem for us, Judith? Hiring Jews, I mean."

"No, not with me setting it up for you. By now, I'm . . . ah . . . well-established in the community."

Morris burst into laughter. "Well-established!" Yeah, no kidding. She's the wife of the richest Jew in the city—far and away the richest—and, unlike me, she doesn't have a reputation for being grouchy about religious matters."

David Fodor studied Morris, for a moment, with an intent scrutiny you didn't normally expect to see coming from a boy still shy of his sixteenth birthday. "You're a lot more than just the richest Jew around, Mr. Roth. You're pretty much a hero to these people."

"And what do you know about that?"

David shrugged, uncomfortably. "A fair amount, sir. I studied up on it, back in Grantville, before we made the trip."

"Studied up"? With who or what?"

"I'm friends with one of the Abrabanel kids, sir. He's in my grade in school." A little shyly, he added: "You're a big hero to him too, you know. 'Cause of the Battle of the Bridge and all."

Morris looked uncomfortable. His wife gazed upon him with an expression that was an odd cross of proud and aggravated at the same time. "I'm afraid my blessed husband still can't wrap his head around all that." She looked at Willa. "But to get back to the point—no, you won't have a problem getting good help, as long as you let me handle it for you. But—to get further back to your question, Joanna—that would mean that, yes, you'd have to be willing to eat kosher. My contacts are mostly in the ghetto, so far."

"That's not true," protested her husband. "You know—we both do—lots of people in the Christian community."

"Sure we do. Each and every one of whom is a noble or an officer or a courtier or a bureaucrat or at the very least an educated person. Usually a clergyman. Or their wives. And just who among them d'you think Joanna and Willa could hire as a cook or a maid?"

"Well . . ."

"Don't teach your grandmother how to suck eggs. Or your wife."

Willa and Joanna both laughed. Then, peered at their husbands.

"Kosher sounds okay to me," said Joanna.

"Beats the alternative," said Willa. "Trichinosis. Cholera. Nothing else, a near constant case of the runs."

"Oh, it isn't *that* bad," protested Bernard.

"No?" His wife made a face. "The last time I was in church—which was the Sunday before we left, remember?—I saw a man—"

"Joanna!" protested her sister-in-law.

"You saw it too, huh? Talk about gross." She shook her head. "Bernard, stay out of this. You don't come to church but two or three times a year anyway, so what do you care? We'll leave our souls in the care of the priests. But I'd just as soon leave our stomachs and livers in the hands of whoever Judith can turn up."

"Not to mention our gall bladders, colons . . ." said Willa.

"Speaking of which," continued Joanna, "what's the condition of the Catholic church here in Prague? For me, that's probably going to be the worst of it. I really like our church in Grantville, even now that Larry Mazzare's no longer the priest."

Morris grinned at her. "Lemme get this straight. You're asking me—the Jew, remember, and none too observant at that—to give you the lowdown on the state of the Catholic church here?"

Joanna grinned right back at him. "Cut it out, Morris. You know perfectly well that it's the political lowdown I'm interested in. I'm not asking you about the theological fine points—or even about the personalities of the priests in town. I can handle that myself."

Morris paused for a few seconds, before answering. "That's kind of a tricky issue, actually. The Jesuits

pretty much run the show here in Prague, and . . . well . . ."

"They're having a nervous breakdown all over Europe," Willa filled in for him. "What with the Pope himself and the Father-General being so friendly to us lately, whereas a lot of the Jesuits are pretty much still in full Counter-Reformation mode."

"Yup," said Morris. "By all accounts, the Jesuits in Poland are in what amounts to an almost open rebellion. Pledge of allegiance to the Pope be damned."

"What about here?"

"They're dancing back and forth, from what I can tell. Most of them, that is. But I can introduce you to one of the fathers who's on the side of the angels. So to speak."

"Okay." Joanna heaved a sigh. "That's a relief. I was really not looking forward to having to attend a church where I felt like an enemy walking in."

Her daughter Amy, who'd been silent throughout the meal, suddenly spoke up. "That's all fine and dandy. But now let's get down to the real nitty-gritty. I broke up with my worthless bum of an ex-boyfriend almost three months ago. Long enough. My heart bled buckets but my wounds heal very quickly. So what are my prospects going to look like here in Prague?"

All the adults at the table stared at her. The seventeen year old girl seemed quite unfazed. "I got no problems with down-time boys. Well. Leaving aside the worthless bum I broke up with. In some ways I like 'em better than American guys, being honest, though you usually do have to educate 'em some on hygienic matters. But how do I go about meeting anybody here? Seeing as how you said earlier, Mr. Roth, that I can't get accepted into your new college until I get my high school diploma—and that might take a bit of doing, seeing as how we're going to be moving here pretty soon. I still got more'n a year left at the high school in Grantville, and that's going to be *sayonara*."

She gazed at Morris. Then at Judith.

"So how's it work?" she asked.

Morris cleared his throat, preparatory to speaking. And then . . .

Said nothing.

"Men," muttered his wife. Judith gave Amy Fodor her most winning smile.

And why not? Judith foresaw no problems. The teenager was rather attractive, allowing for a certain amount of pudginess. But her appearance didn't really matter anyway. She could be downright ugly, and it wouldn't matter. Within a year, with her father established as one of the most prosperous burghers in town—and with the glamorous aura that usually surrounded up-timers, even when they weren't wealthy—Amy Fodor's biggest problem would be beating off unwanted suitors with a stick.

That was especially so, since the girl obviously didn't have any issues concerning down-timers. There were still some American girls and boys whose romantic interests were restricted to other up-timers. But given Amy's attitudes—

"There were a couple of Jewish kids I saw on our way here," Amy continued cheerfully. "About my age.

Both of 'em were cute as hell, too, allowing for the silly hairdos."

Oh, boy.

Her husband cleared his throat again.

And, of course, said nothing.

"Men," Judith muttered.

The Pessimist's Daughter

Written by Mark H. Huston



The Gardens, December, 1634

"I found every last one of those sons-of-bitches. Every last one. Do you have any idea how much money that son-of-a-bitch spends on those sons-of-bitches?" Staunton Bell took a deep swig of pilsner beer, emptied the mug, and slammed it down with a victorious bang. "Could Tony find them? Could he?"

"No, he couldn't. Not at all. Not in a million years." LaDonna Marshall nodded into her beer mug in sympathy. She then straightened in her chair, chugged her mug down, and banged it on the table next to Staunton's. "We need more beer."

"But *I* found them. That is why *I* should be running the Department of Economic Affairs. Not friggin' Tony Adducci. He doesn't even have a degree in accounting. But they got him running the friggin' department." Staunton realized he was being loud, and tried to tone it down to a stage whisper. "He doesn't even have a degree!" He wobbled as he stood up and pushed back his chair, waved his mug, and shouted. "More beer here, wench!" He paused, noticed a few patrons glancing his way, glared back defiantly, and growled. "Sonofabitch." Seeing no challengers, he added a triumphant "Ha!" He sat back down with a self-satisfied flourish, and looked at his co-workers.

"Staunton, be quiet. People are looking at us. This is supposed to be a little after work Christmas Party."

Greta Greenwald felt tipsy, but not nearly as tipsy as the other three at her table. Her fellow down-time clerk, Katarina Zingerly, was a big woman who could drink. LaDonna Marshall, their up-time boss, appeared to be holding her own. Greta looked at Staunton Bell, and shook her head sadly. *There* was a man who could not hold his liquor. Drunk on his ass, as they say. Staunton was winding up again.

"Nasi thinks he is so damn smart. But he missed the first rule. Follow the money. That's what I did." He stood up again, knocking his chair over in the process, and announced to the room, "Follow the money!" A few heads turned to glare at him; he looked back through a pilsner induced haze, and met their glare defiantly once again. "Sonofabitch. Ha!" He then sat down hard on the floor, as he had not picked up his chair. Most of the room gave a quiet chortle.

Greta watched as LaDonna and Katarina helped the skinny and balding accountant back to his chair. It reminded her of two children with a pet ferret. She shook her head. "You should get home to that wife of yours, Staunton. And you should stop drinking. Before you get into trouble."

Katarina agreed. "You should go home, Mr. Bell. We think you've had enough for now." She started to whisper. "You did real well to find all of those hidden accounts of Don Fernando Nasi, you should feel good about the job, but you should not drink. It doesn't agree with you."

"That's right. I found it." He stood up. "Nobody else" he shouted. The glares returned. He returned them in kind. "Sonofabitch. Ha!" He checked for his chair, and sat.

Greta leaned across the table toward Staunton. "You shouldn't talk about work that way, Mr. Bell. Not that loud. You can get us all in trouble. You know we're not allowed—"

"That guy's just another Jew bastard who thinks he can hide his shit from me. I tell you they're all the same. They're all like that." He waved his arm clumsily. "Can't trust them to a man. Just like back up-time. Same shit. When I did taxes up-time—"

"Mr. Bell! You shouldn't say such things." Greta eyed Staunton from across the table. She had a good twenty pounds on the man. She figured she could drag him out of the Gardens if she had to. "We're supposed to be professional. We're auditors. And auditors don't do this, at least in public."

"Professional? Professional? Th-that is ridiculous." He belched loudly. "I have an antique computer that can barely run the software we use, and I use quill nib pens. With a friggin' inkwell, fer chrissakes. Some professional organization that is. Where the hell is my beer?"

LaDonna added her support. "God, I'm shitfaced. I haven't drank like this for a while." She looked around the table, smiled, and then unexpectedly turned green. "Uh-oh. Sh-shouldn't have eaten that—that sausage and ch-cheese. Excuse me pl—" She ran off, unsteady.

Greta looked at Katarina and rolled her eyes. "Up-timers can't hold their beer. My husband told me, but I didn't think it was this bad."

Katarina rolled her eyes too. "My husband said the same thing. I didn't believe him at first . . ."

Staunton looked like he was winding up yet again. "I bet Tony will take the credit for this. I know he will. I find out how the Jew is paying his spies, including some of his relatives, which is illegal as hell. At least it was." He shook his head to clear the fog. "Tony will take the credit. I know it. That's the sort of thing that just pisses me off."

At least he wasn't shouting this time, thought Greta. The waitress put another round on the table.

Staunton turned to her. "About time, bitch."

Greta watched as the down-time waitress looked at the two beefy down-timer women and then looked at the ferret-like man. "This idiot a friend of yours?"

They both looked at Staunton, and then back at the waitress a little sheepishly. "We just work with him," replied Greta, "He's our boss."

"I'm sorry for you." She turned and walked away.

"See if she gets a tip," growled Staunton. "Bitch."

"Watch it, Bucko. You keep talking like that and I'll kick your ass." LaDonna had returned. "She better get a tip."

He glowered at her as she sat down, and they all started drinking again. The girls talked quietly for a few moments about their families, Katarina's husband's job in the mine, anything but the office. Finally, it appeared to Greta that Staunton could contain himself no longer. "Did I tell you how I found the first one?" He started much too loud. "Nasi wrote him a friggin' bank draft. A bank draft! I can't believe the guy is that stupid! Once I had the account, then it was pretty easy to find another. From there, it really took off." He sat back into his chair and folded his arms. "Damn, I'm good."

"I suggest you be quiet, Staunton." Greta was startled by the calm and direct voice of Dennis Grady. She looked at his powerfully built body, and recalled hearing before he came to their Department of Economic Affairs, he had been a police officer. At the office it was not noticeable. But right now, well, Greta was glad she had been quiet. She turned to Staunton, who she expected to shut up. Greta felt her eyes go wide when the little man stood. Defiantly.

"I don't work for you, Grady. I don't have to listen to you. And we are not at the office. So just fuckoff." Staunton rolled his shoulders as if flexing to fight.

"Sit down, Staunton." Grady's voice was low. "Now."

"What if I don't, what are you going to do about it?"

Grady just looked at him with no change of expression. "Whatever I have to."

Greta did not fall off of the turnip wagon just the other day. She had been around more than one drinking establishment in her thirty-nine years. She slowly moved her chair back, in case things got messy. She sensed the rest of the bar feeling the same way.

"You're an asshole Grady. I'm the only real accountant your 'auditors' have." He snorted. "*Professional* Department of Economic Resources, what bullshit. None of you could find your ass with both hands if I wasn't there."

Greta inched back a little more.

"I'm the one who found the Nasi files—"

Greta really didn't see the punch from Grady. She was already ducking. She sort of felt it go by, and then sensed Grady straightening. When she opened her eyes, Staunton Bell was just starting to bleed in the area where his nose formerly protruded from his face. It was now turned to the side. His eyes were glazed. He teetered for a moment, and then fell like a stone to the floor, his head catching the edge of his chair on the way down, and laying open his scalp.

"Sonaofabitch," exclaimed LaDonna.

"Ha," added the waitress.

May, 1635, Grantville, High Street Mansion, SoTF Government Building

"Hello, Ursula." The up-time woman smiled from her office, as she had done for nearly every afternoon for the last two years.

Ursula Volz dropped her plain eyes to the worn wooden floor, nodded her head imperceptibly, and mumbled a quiet, "Good afternoon, Mrs. Carstairs," as she came into the back hall.



Ursula rapidly stepped by the lady in her office, past a large kitchen, and then threaded her way through a narrow hallway, arriving at the front foyer of the old mansion.

There was a guard station in what used to be the front hall. The regular night guard, Marcus Sauber, was sitting in a chair behind the desk. He was positioned facing the front of the building, where the public would normally enter. Ursula had entered by the employee and service entrance, at the back of the house.

The guard turned in his chair. "Hello, Ursula."

"Good evening, Herr Sauber."

"Right on time as always. Here is the note from the office manager, she tells me someone spilled coffee in the second floor hallway, and it needs to be cleaned up tonight." He handed her a note. "It's always something, isn't it? Spills or messes to be cleaned up. Night janitor is never a fun job, right, Ursula?"

"I don't mind it, Herr Sauber." She paused at the desk and signed in on the log book which Marcus Sauber kept.

"Good afternoon, Herr Sauber." Keeping her eyes turned to the floor, she turned to the staircase to the left of the desk, and headed toward the back stairs leading to the basement, taking a candle from the side table and lighting it as she went. There were no offices in the basement, because there were almost no windows. She went down the gloomy and musty stairs, and looked around. Something about being in a cellar always bothered her. The only things down here were storage for files and the cleaning supply closet, which was near the stairs.

Ursula gathered up her things from the supply closet, and trudged up the stairs. She usually started on the first floor, in the public spaces, and then moved to the offices in the later afternoon and evening. She began her work in the Lobby, by the guard station. It had rained during the day, and people had tracked mud into the hallway. With a mop and bucket, she started to scrub.

It was a good job, and Ursula liked it. It was quiet, especially later in the evening when everyone went home. It was interesting working at the High Street Mansion. It was built back when Grantville was a "boom town," owned by a man and his family who made toilets. When Ursula had seen it for the first time, she could not believe it was only for one man and his family. It took her almost a week to learn all the rooms. It was broken up into even smaller areas for more offices and rooms. The home was mostly empty when it came through the Ring of Fire, no one living there, and most of the contents had been auctioned off. Since it was big, and had plenty of light and windows, it was appropriated by the government as offices. Nobody bothered her much at this job, and she liked that too. The only thing a little bit irritating was—

"Ursula! Oh, I'm so sorry I'm late. Sorry, sorry, sorry. I got delayed at dinner with . . . umm . . . my mother. *Aaand* . . . she wanted to talk . . . about her new boyfriend."

Margit. Her co-worker. She finally arrived. About a half hour late, as usual. Ursula sighed. Margit always had excuses, and some of them were very entertaining. But tonight, Ursula was not in the mood. "I will finish this, you can start on the back hallway."

"Don't you want to hear about my mother's new boyfriend?"

"Not especially, Margit. And you used that excuse last month."

"Oh."

"Back hallway, Margit?"

"Okay. Let me get my stuff from downstairs. Back in a minute." She turned and half-skipped down the hall, humming a little tune. Ursula smiled just a little as she watched her disappear around the corner.

After finishing the public spaces and the offices on the first floor, they started up the stairs to the second, where more offices and desks were packed into rooms. Margit leaned over to Ursula. "Are you going out after work tonight, Ursula? You never go, and we have so much fun." Margit turned and bounced

mischievously in her stride.

Ursula looked at her and shook her head. "I need to be home and to sleep so I can help my mother with the sewing as soon as it gets light."

Margit frowned. "Ursula, when are you going to have some fun in your life? How do expect to meet anyone if all you do is work here in the afternoon, go home and sleep, then sew with your mother from first light until you come to work again? You are what? Twenty-one? Twenty-two?"

"I'm very plain, Margit. Who would ever want me? My father is a casket maker. He has no social rank."

Margit stopped on the stairs and blocked Ursula's path. "How many times have I told you it doesn't matter here? It must be a thousand times by now." She changed the tone of her voice, deepening it with authority. "Ursula, it doesn't matter here." She changed back to her impish grin. "There. One thousand and one."

Ursula paused. "Twenty-five. Almost twenty-six."

"What?"

"I will be twenty-six in two months."

Margit's hand went to her mouth. "I'm so sorry, Ursula. I had no idea you were ahhh—were that—ummm . . ." Margit stuttered some more, and after a pause she half-heartedly added, "You look remarkably young for your age . . ." Margit turned red behind her grimace.

Ursula looked at her with a frown. Margit was almost a full head shorter than she, and here on the stairs they were eye to eye. Margit always had several boyfriends, she was always talking about them. Ursula sighed.

"There was a boy in Magdeburg, before the war. But my father said he was not worthy. Since then there has been no real time or stability—we moved so many times to stay ahead of the wars."

"Wait just a second, Ursula. You've been here for two years. And you've been working this awful schedule that prevents you from meeting anyone. You've had plenty of time to meet someone." She turned coyly. "Or even several some ones." She finished with a girlish giggle.

Ursula had little patience with girlish giggles. "Life is what it is, and life is what it shall be. And that's all there is to it. No more. No less. That's all life is." She shrugged and began to climb the stairs.

She trotted past Ursula and once again blocked her path. "That's your father talking. The famous Eeyore Volz. The man with the darkest disposition in town."

"He's a very practical man, Margit. He's provided for us even in the worst of times, since before Magdeburg. You know he got my mother and me out of the city before the siege. He sold everything, cancelled his lease, and moved away. He had the foresight to act before . . ."

Margit grew quiet. "I had a cousin and an uncle there."

"My father is very smart, Margit. We were in three different cities and towns before we moved to Magdeburg. In each one of them, we moved out before something terrible happened. Papa was able to

figure it out, before it happened. We think he is very smart, and that has kept us alive and together as a family."

"But he never smiles. I have never once seen him smile. People stay away from him."

"People don't talk to Papa very often. Mr. Blackwell, who owns the funeral home where Papa works, said most people won't talk to you much when they find out what you do. I'm sure that's why. And we never really had many friends, no matter where we lived. Papa said that suits him just fine, too."

Margit put her hands on her hips and looked Ursula in the eyes. Her short red hair and freckles made her look far younger than she really was. "What am I going to do with you, Ursula Volz?"

"There is nothing you need to do. Things are just fine the way they are."

Margit turned and began bouncing up the stairs. "Maybe. Maybe not." She turned and looked back at Ursula. "But I am not going to let you be an old maid without getting you to have some fun." She skipped off around the corner.

Ursula stood on the stairs for a moment before heading up after Margit. Together they found the spill in the hallway, and then, as usual, Ursula continued to the third floor of the mansion, where they told her the "ballroom" used to be.

Rolf Burger, the night guard was at his post. He had a tiny desk and chair with a logbook where people signed in and out. His post at the top of the stairs put him between a heavy door and the hallway. Ursula was never really sure why they had the extra guard up here. The Department of Economic Affairs had something to do with money, she supposed from the name. Although she never saw any money there. As he saw her coming around the corner, he was already taking the keys off of his belt.

"So how is my fine, beautiful Ursula Volz this evening?" Rolf Burger was pushing sixty-five, had no teeth, and a twinkle in his eye. A mixer. That's what Ursula's mother had said when she described him. A mixer. Mostly harmless.

"I am fine, Herr Burger"

"What's a beautiful girl like you doing in a place like this?"

"Working at her job, Herr Burger." She signed in on his log book. As he let her in, purposely he brushed against her as he backed the door open. He grinned a toothless smile at her as she stepped back. She cast her eyes at the floor and went into the hallway. There was a long hall with a half-dozen doors on both sides. She sat about her tasks as quickly and efficiently as possible, methodically working through one office at a time. Trash, feather dust, sweep, repeat. She settled into a calm rhythm, so when she opened one of the doors to what she thought was an empty office, she was startled to see a huskily built man hunched in front of one of the computers. The screen cast the only light in the office.

"Oh. Excuse me. I didn't know you were here. I can come back later—"

"No. That's quite all right. I don't think we've met before. What's your name?" He stood.

Ursula was still surprised by the up-timer forwardness. The man was very friendly; all up-timers seemed to be. At least the ones she had met. She quickly looked at his hand to see if he had one of the up-time marriage bands. She was relieved when she saw he did. When her eyes went back to his face, they were

observing her carefully. She immediately felt the blush, and looked at the floor. "Ursula Volz, sir"

"My name is Grady. Dennis Grady. Nice to meet you, Ursula. I'm sorry I startled you. I was just finishing up some work. You can just skip my office for tonight."

"Yes, sir." She backed out of the room and closed the door. In a few more minutes she had completed the floor, and she headed for the guard station. She opened the door to find Rolf sipping a hot beverage, with an up-time device steaming in the background. "Cup of coffee?"

Ursula's eyebrows raised. "Where in the world did you get that thing?"

"One of the ladies in the kitchen gave it to me. She said it was broken, so I took it to the tinker. You know we have one here now? He fixed it. The original glass is broken, so I use this ceramic mug. It only makes two cups at a time. This is the first night I have brought it to work."

"That's nice, Rolf. It smells good, too."

From behind her a masculine voice spoke up. "It sure does, Rolf. Smells darn good." Dennis Grady inhaled through his nose, enjoying the aroma.

"Hi, Mr. Grady. Do you want some too?"

Grady looked at the mug wishfully. "Going to have to take a pass. I need that stuff in the morning, not last thing at night before I go to bed. Sure smells good though."

Rolf's rubbery face lit up, and he turned to Ursula. "I have made this for my Ursula tonight, too. She knows I am in love with her, but she will never acknowledge it."

Ursula blushed and looked at the floor, as the old mercenary soldier flirted shamelessly. "Herr Burger, you are full of—poop, as the Americans say." She looked up at him and smiled, like she usually did. "How is your wife at home? I hear she was feeling ill last week? And your grandchildren, how are they?" She quickly glanced over to Herr Grady, and he smiled at her. She blushed again.

Rolf put his hand to his heart and looked crushed. "Oh, Ursula, what am I to do? You are about the only person who comes up here to see me at night. You never ask about how poor old Rolf is doing, you ask about my wife, my grandchildren, but not poor old Rolf. What am I to do?" His rubbery face was pouting and grinning all at the same time.

"Herr Burger. I ask about your wife and grandchildren to remind you it is not polite to flirt with younger women, especially single younger women. One of these days I will tell your wife how you are a shameless flirt with me."

The active rubbery grin left Rolf's face, and left only a pout with twinkling eyes remaining. "She already knows I'm an old goat, my dear." He laughed. "Just don't tell Eeyore, he might look at me and after a while I would jump off the ring wall cliff, I would be so depressed." He continued to grin.

Rolf seldom mentioned her father. Her mild irritation with the old guard was usually playful, but tonight, between him and Margit, Grady, and the spill, she'd had about enough. "My father is a good man who provides an important service to the town. He is not this 'Eeyore,' he is wise. And you should remember that, Herr Burger."

He looked hurt, his pout disappeared, and his eyes softened. "I meant no offense; it's just he is always so pessimistic. So sad. And it rubs off on you too, my dear, you are too young for that. Live a little, have some fun. Soon you will be old like me, and your life will be gone." He brightened and sat with mock suggestiveness on his stool. "However, I am not dead yet, my dear. Come and sit on my lap and . . ."

She turned on her heel and stormed down the stairs, leaving the two men. She was headed for the basement where she could cool off and put her equipment away. She knew she shouldn't let Rolf get to her that way, especially in front of an important up-timer. When she came down the first floor steps, she saw Margit sitting casually on the guard's desk, swinging her feet. She stopped at the bottom of the stairs and looked at Margit. Happy, carefree Margit.

And she was old stick-in-the-mud Ursula.

Ursula thought.

She made a decision.

Quickly, before Ursula could change her mind, she stalked over to where Margit was sitting, still swinging her legs like a ten-year-old. "Tonight," she whispered darkly to Margit, "we go out after work."

As Ursula walked away from Margit and Marcus, she turned and looked back. Both looked stunned.

* * *

"Hey, everyone. I want you to meet my friend Ursula. Everyone, say hi to Ursula!" The little Sycamore Street Pub erupted in smiles and "Hello, Fraulein Ursula" from everyone who was there. Margit pushed Ursula from behind, and she stumbled into the room. She hadn't been in a place like this since she had been asked to fetch her father from a pub like this when she was a girl. She couldn't have been more than six or seven. She remembered the smell of the stale beer spilled on the coarse wood floor, the almost choking cloud of tobacco smoke, and the close feeling of the air inside. She hesitated again, and began to turn toward the door. Margit grabbed her and spun her back around.

"No, you don't, girl. You said you were coming in here with me, and I am making you keep your word."

"I have kept my word. I have come in. Now I want to leave."

"Not until you have had one drink, and meet my new boyfriend. I know he has friends here tonight. He is *sooooo* cute. He's French, you know. I think he's a spy." Margit giggled at Ursula. "C'mon, just one drink."

"Why would you go out with him if you thought he was a spy?"

"Don't be silly. Almost everyone in here is a spy. For one side or the other, sometimes three or four sides at once. Good Lord, Ursula, if they threw all of the spies out of Grantville, there wouldn't be enough men to go around."

"But, spies, Margit? It doesn't seem right to fraternize with the spies."

"Follow me." Margit took her in tow, and dragged her toward a table in the back of the dimly lit bar. "I want you to meet someone."

"But, but—"

Margit dragged her to the table which had three men sitting around it. One was older, maybe in his mid-thirties, tall and with a handsome face. At least the amount of face she could see in the dim lighting of the lamps. The other two were younger in their early- or mid-twenties. They were dressed in plain clothing. Not something a laborer would wear, but more like traveling clothes. Practical, and not fancy. They all knew Margit. One of the younger men stood as Margit approached.

"Here you are, my dear Margit. Who's your most charming friend? Is this the beautiful Ursula we have been hearing about?" Ursula was glad it was dark, as she could feel her face glowing with embarrassment.

"Francois, this is why I love you. You are the consummate male."

"Is it my French accent, or my other . . . 'special powers of love' . . . that make you love me so?"

Margit drew herself up to her full five feet, and presented the Frenchman with a visage as haughty as a diminutive German farm girl could possibly make, and said. "If you think you are ever getting into my knickers without a betrothal, Francois, then you have not been paying attention these last two months." The other two at the table laughed out loud, and Francois looked hurt.

"I only have eyes for you, Margit."

"Nice try, Francois. The answer is still no."

The other men within earshot laughed as loud as the two who were at the table. Margit grabbed a chair from nearby, shoved it up to the table between the older man and Francois, and pushed Ursula unceremoniously onto the seat. "Sit here, girl. You have met Francois, across from you is Pitor, and next to you is Ian." Ursula recovered enough to respond with a bit of dignity. "Herr, Ian. Herr Pitor, how very nice to meet you both." She turned to Margit. "Can we go now?"

Margit plopped herself down on Francois' lap and put her arms around his neck. "Not yet. You promised to have a drink first. Who's buying it?" She looked at Ian and nodded. "I think its Ian's turn at the bar."

Ian nodded in her direction, and replied with a subtle hint of sarcasm. "Of course, Margit, anything for you." He turned to Ursula. He seemed a little more reserved than the other two, and he had a distinguished-sounding English accent, very different from the up-timers. "Ursula, what can I get for you?"

His gaze was gentle but penetrating. His voice had a lyrical quality which surprised her. Masculine and wise. Not wise like her father, but wise is a different way. Worldly, strong. She caught herself blushing, and instantly felt like a duck out of water, awkward and stumbling around on webbed feet. She desperately tried to think of what she should order. She felt rising panic. Then he spoke again.

"Tell you what. I'll get you what I think you might like. I'll order for you. Will that be all right?"

She was certain her blush would be illuminating the room, and everyone at the table could hear her heart thumping loudly in her chest. Then she thought of Rolf, the guard at the mansion. Ursula was determined not to be an old maid, not if she could help it. She took a breath, found the will, and looked up at Ian. "Th-thank you. That would be very nice."

"No, I don't think so Ian," interrupted Margit. She turned to Ursula. "The last time he ordered for me, he came back with a tankard of some homegrown redeye made by the Haygood clan. Almost knocked me off of my chair with the first drink."

Ian looked rather betrayed at the accusation. "That was a drink for you, Margit. This lady is obviously very different, and respectable. I was going to get her one of the house pilsner, like the Yanks drink." He stood and turned to go to the bar, subtly winking at Ursula as he rose from his seat.

Margit shifted in Francois' lap. "Did he just say I'm not respectable?"

"I'm sure not," replied Francois with a grin. "However, you may remember the Haygood Redeye was meant to be sipped. As I recall, my love, you took a prodigious swig the first time he gave it to you." He turned to the others at the table. "It wasn't pretty."

Everyone laughed, including Ursula, who gasped when she realized she was having fun! Her! Ursula Volz, the one who never had any fun. The daughter of Eeyore Volz. She was still frightened, shy, even overwhelmed . . . but. She was having fun. A gleeful and satisfied smile was creeping onto her face when she turned and looked at Ian, returning to the table with their drinks. Her heart started thumping again, quite on its own accord.

June, 1635, Grantville

Karol Volz was not feeling like a happy man. That, by itself, was perfectly normal. Karol Volz was never happy. But today, very early in the dark of the morning, he was more unhappy than usual, to the point of upset. Over the past two months, his daughter Ursula had been coming home later from work than was normal. It started out just once in a while at first, then it became more and more frequent. Now, for the first time, she had stayed out for five nights in a row. She always helped her mother with the sewing, just as she should, without fail. She always made it home, but she smelled of pipe smoke and beer. Karol knew she was meeting friends after work, at a small pub called the Sycamore Street Pub, which as one could tell from the clever name, was located on Sycamore Street. Karol harrumphed. This wasn't the sort of thing a woman should do no matter how old. She said she was with her co-workers, and staying out late was an American tradition she needed to follow. But enough was enough. He had not suffered and wandered war-torn Germany to bring his daughter to a place where all she did was drink and carouse. It was not right. Behaving in such a way was weak, and could lead to complacency. His family was not weak, and they would never be complacent. Not as long as he was alive.

Granted, the two years spent in Grantville had been the best in many years. It was comfortable, they had enough to eat, and he had steady employment building elegant wooden coffins which occasionally challenged his talents as a cabinetmaker. He was well paid. Central heating in their tiny apartment. Plumbing from the twenty-first century. It was very comfortable.

They had no friends, only knew a few people, and he liked it that way. If you became too settled, you became weak, which led to being complacent, which inevitably led to tragedy. Always vigilant, always prepared to survive. That was the struggle of life in this time, and anyone who thought differently was a fool.

He heard the sounds of conversation at the door in the hallway. Quietly he picked up the sputtering candle and moved to the door. He put his head against it to listen.

". . . nice time as usual, Ian. Thank you for walking me home again. You don't have to do it, though. I was walking home for two years before I met you."

"As always, it's my pleasure to do so." There was a pause.

Karol opened the door and looked at the two of them. Ian was holding his daughter's hand and was bending to kiss it. The candle held below Karol's countenance made it look as if his disembodied head was floating in the darkness. Both Ian and Ursula jumped back, Ian dropped her hand.

"Papa! This-this is a surprise."

He responded with a small grunt.

"Papa, have you ever met Ian? Ian, this is my Papa, Karol Volz. Papa, this is Ian. He is a-a friend."

Another small grunt. He looked at this Ian fellow, slowly, up and down. Karol didn't like the way he was dressed, the way he stood, or the way he smelled. He liked nothing about the man. He sounded foreign. Foreigners are never a good sign.

Ian tuned to Karol and extended his hand. "I'm very pleased to meet you, Herr Volz. I've heard many things about you. Your daughter says you're a wonderful man, very intelligent."

Karol let the man's hand hang in the air, and raised his candle to the man's face to get a good look. He was handsome in a way. Which made it all the more improbable his intentions toward Ursula were honorable. Karol gave a slightly more definitive grunt which registered his displeasure, then looked at his daughter and tossed his head in the direction of the door. She immediately went in, leaving him and Ian alone in the doorway. Karol gestured for the Englishman to come closer, and he whispered a monotone into his ear.

"If you do anything to hurt her, you will pay."

Karol leaned back and again put the candle up to the face of the Englishman, and watched for a reaction. The fact there was none told Karol all he needed to know. *He's masking his reactions, his intentions are far from honorable. He is a skilled liar.* Karol kept his face passive as he read the man's reactions. As he brought the candle back to his face, he said simply and flatly. "Understand?"

"Perfectly." Ian then looked past Karol, into the darkness of the apartment where Ursula was waiting, out of sight. "I will see you on Monday night, Ursula. Thank you for a wonderful evening."

"Thank you," replied Ursula timidly from the darkness, as Ian retreated down the hallway.

Karol closed the door and grunted again, softly, with worry. He held the candle below his drooping face, and turned to seek out Ursula, who appeared out of the shadows. Without changing expression, he simply said, "I forbid you to see him."

Ursula whispered angrily. "You can't do that. Not here. Not in Grantville. Things are different here. *I am different here.*"

"There is no discussion. I forbid you to see him."

"Papa. I am old enough to make these decisions for myself. It's important I keep seeing him; I'm enjoying life for a change, Papa. Can you understand?"

Karol stepped toward Ursula so quickly, she retreated a step. He whispered harshly. "That man is false. He will hurt you."

"So what? So what if he hurts me? That's my choice, not yours. You don't think I know he's full of . . . of—poop most of the time?"

"Keep your voice down. You'll wake your mother."

"Do you understand why this is important to me, Papa? I need to do this. I need to do this now. Here in this place. Grantville. This is our home now, Papa"

"Our home is where I say it will be!" His voice was barely contained. "We're staying here for now. It's comfortable. Too comfortable I think, for our own good. It has clouded your judgment. The evil world is still out there, Ursula. And it can come roaring down the street any time of the day or night, like the horsemen of the apocalypse. We need to be prepared to move on at a moment's notice, fleeing before whatever army or plague is coming next. There is always an army or a plague coming. Being involved with people only slows you down. It clouds your judgment. Stay separate from the community, and live off of it. You must not become attached."

"I don't want to be a parasite on where I live. I want to live here, not just exist. I want to be part of this community, to grow. This is a special place."

"Special? All you do is pick up people's trash in the evening."

"You just don't understand, Papa. You just don't understand."

"You are wrong, Ursula. I do understand. I understand perfectly well what you wish. It's you who fail to understand the consequences of what you wish for. You know I'm right. We've escaped from how many towns before they were destroyed? Three? That boy, back in Magdeburg. Is he alive now? No. He is dead in the ground. Rotting flesh, if there was any flesh left from the fires. What would have happened if we—or you—had stayed behind because of a feeling of fondness for him? Or his family? Or our neighbors?" He paused and looked at the candle, the single source of light in a very dark room. He took a breath and looked his daughter in the eyes. "There are two states of being. Life and death. Don't give me any religious crap. When you die, you go to the same place you were before you were born. Nothingness. So if we flee, if we live like parasites, it is because we must. To survive. To live."

He could see Ursula's eyes full of tears in the dim light, and she snuffled. "There's got to be more, Papa. There's got to be more . . ."

He placed the candle on the table, and put his strong arms around her. "There is no 'more.' Only family, and to survive. Stay away from him, and all the other entanglements and snares in this place. We must be able to think clearly."

"I can't, Papa."

"I will not leave you behind."

"You won't have to. When and if the time comes to leave, I will be there with you and Mama. You have

my word, Papa. My solemn oath. But I must keep seeing him. It is very important."

Karol broke the embrace, and looked at his daughter. Her features were difficult to make out in the light of the fading candle. "Is there something you are not telling me?"

"No, Papa."

"You are not with child?"

"NO, PAPA!" she gasped. "I would never. We would have to sue him for support for the child. That would be an entanglement."

"Go to sleep now. In the morning, in the light of day, this won't seem so bad. I have an errand I want you to run in the morning."

"Yes, Papa."

He grunted his goodnight.

* * *

Ursula squinted against the bright sunshine as she made her way into the heart of Grantville. Ollie Reardon's machine shop was easy to spot. It was one of the largest in town, near where the railroad tracks used to be, before they were torn up and used for the ironclads. The large metal sided building was confusing, and she did not know where the office was located. There was a group of men outside one of the big roll-up doors, who looked to be taking a break. They all squatted on the ground, or perched on various pieces of scrap in the side yard of the shop. She timidly approached one of the men standing away from the others, reading.

"Excuse me. Can you tell me where to find the office? I have some hinges from my father . . ."

The man looked up from his reading, a thick book with very small printing. It looked to be some sort of a technical book, and he had been studying it closely. "Of course. It's right through the door here, and to the right, follow the path with the yellow lines, the office is just past the line boring machine and the old . . ." He stopped and looked at her expression. "Never mind, just follow me."

"Thank you, sir."

"No need to call me 'sir.'" My name is Heinrich. Heinrich Fremd. Haven't seen you around town before."

They walked toward the door. "My name is Ursula. Ursula Volz. We have lived here for two years."

Heinrich got a twinkle in his eye. "That is a shocking name, Miss—it is "Miss" isn't it—Volz?" She nodded, blushing slightly as they passed into the shop. "I guess you hear that joke all the time."

"What joke is that, Heinrich?"

"You know, Volts. Shocking? Volts can Hertz you? There have got to be a million of those up-timer jokes." The expression on her face must have given it away. "You have no idea what I am talking about, do you?"

"No, Heinrich, I don't."

"Seriously?"

Ursula felt mortified. If it had been two months ago, before she started going out after work, stretching herself, she would have fled this embarrassing encounter in tears. But today: "Heinrich. I-I . . . You are embarrassing me." The last part came out stronger than she meant it to, and poor Heinrich looked stunned.

Heinrich stopped and turned to her in the middle of the quiet shop. He was blushing. "I'm terribly sorry. I assumed you were an old Grantville hand after two years. Please forgive my forward behavior. I apologize, I'm not that sort of an oaf. Although I'm acting like it." He bowed at her briefly, as a courtier might, in the middle of the machine shop. "I must make it up to you. We need to start over. Could I buy you lunch tomorrow as an apology? Please?"

She saw the office door just ahead of her. "Thank you Herr Fremd. I appreciate the guidance. But I can make it to the office by myself now."

"And lunch? Tomorrow?"

She stopped with her hand on the doorknob to the office, and turned to him. "Why not? I'll meet you at Billy's Diner tomorrow at noon." She really liked the cute expression on his face, a combination of embarrassment, happiness, and now worry. What on earth could he be worried about? She went into the office and closed the door behind her, a quick glance told her he was still standing in the aisle, with the same dumb-cute look on his face.

* * *

The end-of-break bell rang, and men started going back to the machines. The bell shook Heinrich out of his trance. "What in the hell did you just do, Heinrich? You idiot." He started walking back to his machine, shaking his head slowly.

"Hey, hang on there a minute, Heinrich. You sure were nice to that young lady. Although she looked like she wanted to run away for a moment or two." His foreman, Grant Matowski, was flagging him down. "What did you say to her?"

"I made a stupid joke about her last name. It is Volz, so I made a very lame joke about volts and hertz—"

"Her name is Volz? Holy shit, it's true. Eeyore does have a daughter. Wait a second. You didn't ask her out did you?"

Heinrich shifted uncomfortably. "I had to, after I embarrassed her. Lunch is all. Billy's Diner tomorrow. And who is E-hore?"

Grant started laughing. "EE-Yore. You know, the melancholy donkey? Surely you know Eeyore Volz, the saddest man in town? Oh, I remember now. You don't go to funerals. Or church."

"Let's not start that again, Grant . . ."

Late August, 1635, Grantville

Elsa Volz looked at her daughter across the kitchen table which doubled as a sewing table in their small apartment. The apartment, while very tiny, had one major advantage, the large south-facing window in the kitchen. The large window allowed Elsa and Ursula to sew from dawn to dusk. Elsa looked carefully at her daughter. She seemed very tired, her eyes were red, and there were circles under her eyes. Her hands were steady, so Elsa knew it probably wasn't alcohol. She had lost weight. She came to bed late, and awoke before anyone else. Elsa leaned back from her work and looked out the window.

"You look tired, Ursula. Have you been feeling well?"

"I'm okay."

"Have you been sleeping well?"

"Enough."

"I see." Elsa went back to her sewing for several moments, the only sound was of rustling cloth. She put it aside again. This time she looked at her daughter, not out the window.

"Your father says you are 'dating' three men."

Ursula flinched. "Ouch. I stabbed myself with a needle. Silly me." She popped her thumb into her mouth, sucking on it to stop the small blood flow.

The room was very quiet now, and Elsa leaned forward toward her daughter. "Care to explain to me how you are dating three men? At the same time?"

"I am not 'dating' three men at the same time. Daddy is overreacting. I have only seen two, and one of them only once. I don't know where he gets the third one."

"Go on."

"Well, you know about Ian. He's just a friend from work. He doesn't work there, but he hangs out at the place we go after work most of the time. We're just friends."

"Your father said he caught him kissing you?"

"That's silly. On the hand, yes. But he's English. They do that sort of thing."

"And what does this Englishman do to make a living?"

"Mother, it is not like I am planning on marrying him or anything. He's a student of sorts, and he does research about Grantville, and he corresponds with his home."

"So he has no normal job?"

"His job is not normal."

"And this mystery man from the south? The one who has a regular job at the machine shop? Who says his name is Fremd?"

"Has Daddy been following me?"

"He heard you went to lunch with him. Is this true?"

"Yes, Mama. It's true. But we met at a public place, and he just bought me lunch. He wanted to apologize to me for embarrassing me at the machine shop. He's really very sweet."

"Do you know he's not married, yet cares for three children? Three he 'adopted' after Magdeburg."

"He told me about it at lunch. He positively dotes on those children."

"Parents are known to do that now and again." Elsa trailed dry and loving humor through her last remark.

Ursula finally looked up and smiled. "I have heard that now and again, about parents."

They both went back to sewing for a while, and Elsa asked another question. This time there was no humor or kindness in her voice. "And the Jew?" Elsa watched her daughter's reaction. She seemed surprised, and yet frightened. Elsa's concern grew. "Your father says that you meet him right after work sometimes, but only for a while. What are you doing with a Jew in a dark alley? I have heard about them, and some of the things they do to good Christian women."

Her daughter sputtered. "I don't know what you are talking about. I know nothing about this Jew. Why would I do anything with one of them, mother? This is just silly."

Elsa leaned back in her chair and pushed a strand of graying hair out of her face. She sighed. "So you are not going to tell the truth about the Jew?"

"There's nothing to tell. You and Father are mistaken. So just drop it. Please, just drop it. Next you will have me as one of the emperor's concubines." Ursula stood up. "I will need to be at work soon. Tell Papa to stop following me. I gave him my word I would leave with you, if it came to it again. Isn't that enough?" Her voice started to rise, and Elsa's followed.

"No, that's not enough! Do not raise your voice to me."

"Then don't accuse me of meeting Jews in alleys!" She stopped, horrified she had yelled at her mother. She began to cry almost immediately. "I'm sorry, Mama. Please forgive me. Please. It's been hard these last few weeks for me. It's almost over. Please, do not be angry with me. I am a good and faithful daughter. You must understand. Please."

"But I don't understand. If you're in trouble, then you must talk to us. We can help."

"No. I can't. You can't. Please. Just leave me alone." With that, Ursula broke down and ran crying from the apartment, leaving Elsa frozen at the kitchen table.

Later, she spoke to Karol. He paced about the room after she related the story to him. "What's wrong with her? What's she doing?"

Karol stopped his pacing. "It's time to move again, away from here. If she's in trouble, then the best thing to do is to run away now, before whatever it is blows up. Gather up the money from the hiding places. We will change it to gold as soon as we get somewhere we can. I'm thinking Amsterdam. The lowlands are prospering with the peace. There are many opportunities. We'll do well, I am sure. We leave as soon as we can close accounts from the bank in the morning."

Elsa stood resignedly. "Very well. This was such a nice place."

"I liked it too. But we must survive. And to do so, we must move on. This is why we've no close ties. So we can pick up and move on without any encumbrances."

"Do we have to Karol? Do we have to leave? Let's wait until we see what happens. How bad can it be?"

"This isn't open for discussion. We leave tomorrow."

* * *

"Where's your partner tonight Ursula? She been having too much fun lately? Couldn't make it to work today?"

"She is just sick, Rolf. And that means more work for me. Let me be, so can do my work."

"That's too bad." He pouted. "When are you going to make this old man happy? Will you ever say yes to me? A little smile? A quick peck on the cheek? I'm just a harmless old man. Come on, Ursula. When will it ever be?"

"Not tonight, Rolf, I have a lot to do. Please." She stepped past him and through the door, which he closed and locked behind her, as usual. She went in to the bathroom, flipped on the light, and started to clean it very quickly. While wiping off the mirror, her reflection caught her eye. Any other night, she would have ignored it. Tonight, she stopped and stared. The harsh fluorescent lighting in the white bathroom gave her face a hard and worn look. Her plain brown eyes had lines under them, and crow's feet at the edges. There were dark circles under her eyes, a too large jaw and a too large nose for her face. Her hair was pulled back with a scarf tied around the back of her head. It surprised her how old she looked. She spent several moments mesmerized by her face. Her expression then began to go from neutral to hardened. Her expression made her uncomfortable. Resolutely, she embraced the discomfort, turned, and headed out the door of the bathroom flipping off the lights as she went.



She immediately went to the next to last office at the end of the hallway, and closed the door behind her. She then pulled up her dress, and began to bring objects out of the shift beneath. The first was a small flashlight, that she held in her mouth, the others she placed on the table. She then unwound two cables from beneath her shirt, a tiny one and a larger, thicker one. She crawled under the table where the tall box for the computer sat, then pulled the computer away from the wall to access the back. She unscrewed one of the thicker cables, and then inserted her own, routing it to the top of the table. The other cable, the extension cord, was plugged into a power strip, and into that cable, she inserted a fist-sized black box she knew was a power supply. That cord she quickly routed to the table top.

She scanned the tabletop with the small flashlight for the next items. A small flat blue box, with a slot in the front, and a small floppy disk. Into the blue box she plugged the cords. A light lit up on the blue box. She inserted the floppy into the computer on the floor, and turned on the power. The machine cranked slowly to life. She held her breath for a moment, and waited for the old one hundred megahertz machine to recognize the floppy, and start to boot from it.

It did. She started to breathe. She was focused, she had practiced long hours to understand all of the components, to be able to connect them in the dark.

She reached under her skirt again, and pulled four small square plastic boxes, removed the one hundred megabyte Zip disk (she remembered how she smiled at the funny name the first time she heard it) and placed it into the blue Zip drive where she had already connected the cables. She then removed the floppy from the computer, and restarted it.

While the machine slowly rebooted, she went to adjacent offices and began to quickly dump the trash cans into her cart. It would not do to not have the office at least partially clean, anything else she could blame on the fact Margit was not in tonight. She completed six offices by the time the computer was ready to be used. She glanced at the locked door, where Rolf sat outside. Up to this point, she had been too busy to be frightened. Now came the hard part. Sitting in front of the computer and copying files to the external Zip drive.

Since the security to the machine was bypassed with her floppy, she was able to access the files. But it took time. Time to locate the right files, time to copy the files to the discs, and time to remove any evidence of her being there. Sitting and looking at the screen, with little else to do than wait for the process, her nervousness began to build.

She scanned the file tree for the files labeled "NSICSH," and copied them to the zip drive. Nasi Cash, is what that stood for, she knew. It was a slow transfer. While other files were transferring, she dashed out and grabbed waste cans from three other offices and emptied them. She copied other files onto the disks, swapping them out until they were full. She knew it was taking too much time. She would be in the security area longer than normal. And that could raise suspicions if someone reviewed the logbook. But there was little she could do, except wait for the files to copy, excruciatingly slow, to the external drive.

The contents of the computer looked like mostly spreadsheet files filled with financial data. When the last Zip disk filled, she began to disassemble the devices and reconnect the system to the original configuration. She placed the disks, power supply and the blue Zip drive into the pockets sewn into her shift. She shut the computer down, and then restarted it. She only had to wait for it to boot up again, and then shut it down for the last time, understanding this action would erase evidence of her presence.

While the machine was rebooting, she emptied the last of the trash cans, and was in the hallway on her way back to the open office, when Ursula heard the key turn in the lock of the hallway door. She suddenly stopped, halfway back to the computer, her back to the door. She heard the hallway door open, and Rolf called to her. "Ursula? Miss Volz? What are you doing in there tonight, my beautiful girl? You are ten minutes longer than usual."

Her heart, which was finally beginning to settle down, started beating wildly again. "I-I'm just about finished Rolf, I will be right there."

"You are done in here for tonight, and don't argue with me. You have been working too hard young lady, and you need to go home." He walked into the hallway to her cart, and began to drag it out of the room. "Wait until Margit comes back here, I am going to give her a piece of my mind, leaving you to do all the work. Let's go. Now."

She stayed still, trying to figure out how to get back to the office where the computer was still on. She had to turn it off, and she had to do it without raising Rolf's suspicions. She turned to Rolf. "I just have the one office to finish, Rolf. Let me finish that one." She pointed to the open door.

"Okay, young lady. But hurry it up. If you are in here longer than normal, I need to write a report. And I hate paperwork."

"Oh. I d-didn't know!"

He grabbed her cart and began pushing it toward the door. "Close that door and come along."

She swallowed and rushed into the office, grabbed the computer mouse and clicked the on-screen buttons to start the minute-long shutdown sequence on the machine. She quickly turned and backed through the door, trying to make sure the computer was really going to shut down. It seemed to be. She turned around and bumped into Rolf.

"Ursula, is everything okay with you tonight? You don't seem like yourself."

Her heart started to race again, and she could feel herself trembling. Rolf's eyes looked her over, and

then went to the office door behind her. He got a questioning look in his eye, and moved her to the side. His hand went to the knob of the still open door.

"You are right Rolf, I haven't been feeling very well lately. Maybe I've got what Margit has. Not been sleeping well, either."

His hand still on the doorknob, he looked at her with a question in his eyes. She could see the light from the monitor inside the dark office, as the slow computer went through its shutdown sequence. Her mind was racing, and her tension was building to a panic. *Oh, God. He is going to see the computer on, and that will be the end of me.* She stepped back slightly and her knees felt weak.

"What is the matter Ursula? Are you ill?" Rolf stepped away from the door and went to her. She took another involuntary step back.

"I-I don't feel well, nervous or something, I guess. I think I need to sit—yes, sit down, and some water please?"

He took her hand. "Lord, girl. You are trembling. Come. Sit in my chair. Out there on the landing. Can you make it?"

"I think so." She glanced over her shoulder at the open door, where the computer was still shutting down. She could see the glowing light in the office from the monitor. "Yes. Let me sit in your chair." He led her down the hall to his chair behind the tiny desk. She eased herself into the chair, still trembling slightly, forcing herself to breathe normally.

Rolf looked at her with kindness. "You have been working way too hard. A pretty young lady like you should not have to work so hard. It leads to a shorter life, let me tell you. My brother worked very hard, and he didn't live to see fifty. Simply dropped dead in his shop one day. That's what his widow told me. Me, I don't plan to have that problem, and so far it's working." He chuckled and then smiled at her. "Can I get you something to drink? Water maybe? I have a little coffee left?"

She looked past him in the hall, trying to see if the glow from the monitor was still dully illuminating the office. "Yes. Water, please."

"Okay, coming right up." He went into the bathroom with an empty coffee mug. "I need to rinse this out . . ." He disappeared into the bathroom. She could hear the water running. She looked down the hallway and could tell the monitor was still on. The distance was too far for her to get up and close the door before Rolf returned. She tried to swallow, but her mouth was too dry. Rolf emerged with the mug of water. "Here, drink this."

She took the water from him with both hands and drank greedily, draining the mug. She gave it back to him with both hands, so he would not see her trembling. "Thank you, Rolf."

"You are welcome. Stay here, I will get your cart and close the doors." Ursula watched helplessly as he turned and strode down the hallway to the slightly open office door, looked briefly inside, and closed the door. Ursula gave an inward sigh of relief. The computer had shut off. Rolf then pushed her janitor cart with the trash out of the corridor, and locked the door behind him.

Rolf looked at her with a scornful expression. "Young lady, you are done working for tonight. I'll take the trash and the cart down later. Go home and get some rest. Old Rolf knows the dangers of working too hard. One uncle on my wife's side worked too hard, and he didn't even make it to forty. Of course,

Tilly's army burning his village and killing him might have had something to do with it. But still—he worked too hard before that." He looked at her with a concerned expression.

Ursula acknowledged his concern, and managed to return a small friendly smile. "Thank you, Rolf. I think I will go home now."

"Do you need help going down the stairs? Don't worry about signing out, I'll take care of it. I can't leave the floor, but I can call Marcus up here to help."

"No. No. That's not necessary. I can make it down. The water and just sitting for a moment helped. Thanks, Rolf."

"And don't work so hard. When you're well and return, I will tell you about my cousin—"

"—Thank you, Rolf." Ursula turned and eased down the stairs, increasing her speed to a quiet scurry as she distanced herself from Rolf. She felt one of the cables around her waist working loose. She slowed to snug it under her clothes. At the top of the first floor landing, she nearly ran head long into Dennis Grady, while she was tugging at her shirt.

"Easy there, Ursula. It's Ursula, isn't it?"

Ursula's hand went to the top of her blouse and clenched the neck. She looked at the floor. "Y-yes, Mr. Grady." Her other hand went to her lower back, where she could feel the cable coming loose. Part of it was hanging out of the back of her shirt. "I am sorry, sir. I don't feel well tonight, and my partner did not show up for work." At least it was easier to take a deep breath without the tightness of the cables.

"I hate it when that happens. Is old Rolf awake up there? I don't want to scare him too much. I came to get some paperwork out of my office for a meeting tomorrow."

"Rolf, sir, is very conscientious. He doesn't sleep on the job."

"Ursula, look at me please." She slowly looked up to meet his eyes. She thought he must certainly hear her heart beating. His gaze was penetrating, his face was analytical.

"He knows!" her brain shouted. *He knows something is wrong. I can't keep looking at those eyes. They have to know. He must know.* She dropped her eyes to the floor to escape the scrutiny.

He looked at her in silence a moment longer. "You're right. I don't think you look at all well. Are you done for the night?"

"Yes, Mr. Grady, sir."

"Please call me Dennis."

"Yes, Mr. Dennis, sir."

He rolled his eyes and chuckled. "Just Dennis, Ursula. Just Dennis. Okay?"

"Okay. D-Dennis. I'm done mostly for this evening. I didn't do much on the second floor, that's Margit's."

"Then go home. Now." He put his hand to her forehead. "You're warm. And trembling. Get out of here before you infect all of us."

"Yes, sir. I was just going." She backed away from him on the stairs. "Thank you—Dennis." She continued backing away, and he continued to watch her. Still observing, still analytical. She smiled at him a last time as he abruptly broke his gaze. He then turned and trotted up the stairs.

She quickly adjusted the dangling cables under her shirt, and went down the last stairs to where Marcus sat with his logbook. She quickly signed out, noting the time, and left the building by the back door.

She had done it. She was out of the mansion. Free and clear. She felt pride about what she had just done, and at the same time ashamed. *I have lied to everyone who has been nice to me since I came here. I have lied to my parents, my friends.* She had reached the end of the sidewalk, and started down the street. Tears welled up in her, and she fought to keep the feelings under control. Pride. Grief. Passion. Betrayal. They all started to boil and conflict like a toxic soup, as she increased her distance from the mansion.

"URSULA! STOP! STOP RIGHT THERE! It sounded like Marcus, the downstairs guard. She stopped in mid-stride. She fought with the emotions already there, as they mixed with the overwhelming re-occurrence of fear. She felt physically sick. She swallowed bile in her throat. She slowly turned around and could see Marcus and Dennis Grady walking quickly toward her. She involuntarily reached for her waist, to check the cables wrapped there. She felt one dangling out.

She felt an odd sense of relief sweeping over her, pushing every other emotion aside. *I am caught. Finally, it can be over.* She strangely welcomed the capture. They trotted up to her, and Marcus grabbed her by the upper arm. She drew away, but could not break away. She pulled her hands to her chest. She was unable to say anything.

"Hold on a moment, Ursula. You're not going anywhere." It was Dennis Grady, and he was—was smiling at her? "You're not going anywhere without this sweater. It's getting cold out here. Feels like fall. Take this, you are sick enough. Okay? It is too big for you I'm sure, it's mine."

Somehow, she wasn't sure how, she managed to say "Thank you, Dennis. This is very nice of you." She choked back a confused half sob. She saw the two men look at her, and then smile a "we-did-the-right-thing" smile at each other. She put the sweater on. It was almost the size of a nightshirt, and hid the dangling cable. She gave them a damp, teary smile. "I must go. Th-thank you."

When she was out of sight of the mansion, and alone on the dark street, she started to sob quietly to herself. To anyone walking by, it sounded like a cry of grief.

* * *

Ursula walked up to the door of the small house her three foreign friends were renting, and rapped on the door. Pitor, the one from Poland who was her computer "guru" as Ian called him, answered the door. She went into the living room where the curtains were drawn, and went to the table where Ian and Francois were already sitting. Ian's eyes were bright with anticipation. "Did you get them for me, my love?"

"Of course, I did. Did you doubt me?"

Ian turned to Pitor. "How did she do?"

Pitor smiled. "She was amazing. I thought she was going to be captured by the guards, they told her to stop outside the mansion. But she kept her cool, because they just gave her a sweater, didn't they Ursula?" She nodded. "This is a brave woman."

She smiled at Pitor. "Thank you. It was nice to know you were nearby."

"You're welcome. May I have the things? We need to look at them to know if they are valid or not."

"If you don't mind, I will excuse myself and remove all of this hardware." She went down a hallway, and quickly removed the cables, drives and the valuable disks from their hiding places in her clothing. She went next door to the bedroom, where a computer was set up on a desk. Pitor took the items from her, and started to reconnect it to the system.

"You were right, Pitor. The system there was very slow, compared to yours. It almost got me caught upstairs by old Rolf. But the boot disc worked perfectly. You really are amazing, Pitor."

"I have been doing little else than studying the technology for the last six months. It is complex, and I certainly don't know everything about how it works, but I have learned enough to get by."

Pitor was starting his computer, and he eagerly put in the first disc.

Ursula cleared her throat to get their attention. "How is Margit?"

"How is she, Francois?" asked Ian.

Francois looked and smelled like he had been drinking before he arrived. He rubbed his eyes and shook his head to clear it. "She'll be sleeping this one off for a while yet. We were drinking Haygood Redeye. She matched me shot for shot, until she passed out. Margit could never resist a drinking challenge. But one thing about that kind of alcohol. It can be cut with water, and you never know it." He smiled mischievously. "Mine was watered, hers wasn't. Still, I have a headache. And I'm not looking forward to riding hard in the morning. I will miss the little fireball, even though I never got into her knickers. Damn!"

Ian turned to the other two men. "Gentlemen. I believe we agreed once we had possession of the information, we would never be apart. Not that we are dishonest men, understand, but while we are together it removes any . . . temptation." He looked at his partners, and they looked back with smiles and nods.

Pitor grinned as his computer started. "It looks like it is here. This is amazing. We are rich! Here is the file, just as promised."

Both of the men stepped forward eagerly. "Open the file. Open it!" They waited as the computer buzzed and the file started to open. It then stopped.

"It requires a password to access the file," groaned Pitor. "This was not supposed to be there."

Ursula cleared her throat at the men. "Ahem." The three turned from the computer screen and looked at her. "Go to the last zip disc. There are a couple of text files I found, with lists of passwords in them. I think they are called 'PSSWRD dot Text.' Not very clever if you ask me." She smiled at Ian. He turned and embraced her.

"My love! You astound me."

She blushed and looked at the floor. "I just remembered what Pitor said about how up-time people were very careless with passwords and such. I checked around the office like we planned and I couldn't find any. But I found them on the hard drive. At least I think I did."

Pitor had his head down on the computer, and after a while, gave a little whoop. "That's it! We're into the file!" I am making copies now. On floppies, zip discs and the hard drive. That should cover us."

Francois came out of the kitchen with four beers. "This calls for a toast. To Ursula. The brave, beautiful, and very smart lady to whom we owe it all. Cheers."

Ian embraced her, and gave her a gentle kiss. "Why do you look so sad, my dear?"

"Because you are all going to leave in the morning, and I will be very lonely. At least until you send for me, Ian."

Ian looked into her eyes. "I'm very proud of you, my love. I'm going to miss you. You know I'll send for you the moment I get back to my estates in England. There are many things I must do there before I bring you to me. You understand, don't you?"

Ursula sighed. "I'll wait for your letter, and leave my family in an instant. Do you have my traveling money, for when you send for me? You said I would have it now, Ian. Do you have it?"

He smiled the warm smile of his at Ursula, which certainly melted her heart, and reached for an envelope in his case below the table. He handed it to her. "This is your money for traveling, my dear."

She blushed and turned away, then quickly looked into his eyes and chewed on her lower lip with sadness. "The next time we walk arm in arm, it will be in London, at your estate. Please don't wait long to send for me."

"It will be as soon as humanly possible, my love." He released his embrace. His eyes were shining at her with pride. "May I have the pleasure of walking you home for one last time, my love? I am afraid we will have some company." He kissed her hand, and turned with a flourish. He proffered his hand, she accepted with a curtsy. He then took her hand and led her through the door. As they hit the outdoors, the air felt crisp. Fall was coming and there was a hint of it in the night air. They waited as Pitor and Francois locked the house. They each had a floppy disc in their pockets, just to be sure.

They joined arms and began walk toward town, with Francois and Pitor following them. Ursula looked up at the moon, and sighed again. "Will you send for me in the spring, Ian? Is that when?"

"Most likely, my love."

She touched the envelope tucked into her waist. "I hope I can wait that long."

He leaned over to her. "We English have a saying about such things. 'Good things come to those who wait patiently.' That will be you."

She giggled excitedly. "Yes! I am so looking forward to seeing London. The holes in the tower walls are quite a tourist attraction now, I hear."

"You are right, my dear."

"Oh, Ian." She put her arm around him, and felt the blade he sometimes carried inside his coat. She looked at him quizzically.

"It is a precaution, Ursula. Nothing more. We have all worked hard to get this information. We can't let anyone else have them, can we?"

"You are so wise. I knew the first time I saw your face in the pub. 'That is a wise and caring man,' I said to myself. Hard to believe it was only three months ago. It seems like a lifetime." She looked over her shoulder at the two men following at a respectful distance. "There is no chance of us to be alone tonight then is there, Ian? Not with them behind all the time."

Ian leaned to her again. "Sadly, my love, it's true. I rather wish you had said something earlier about being alone together, before tonight. There just isn't enough time, I'm afraid."

She shrugged. "I can wait until London. We will be together then."

"Over my dead body, you good for nothing piece of—" It was Eeyore Volz charging out of the blackness of night. His powerful arms took Ian down to the ground. There was not time for him to draw a blade. They began to struggle.

Ursula's first impulse was to scream. She cut off the impulse, and nearly crashed head-on into Pitor and Francois as they were coming to Ian's aid. She hissed at her father to stop. Francois and Pitor dove in on the side of Ian. Ian then stood and drew his blade.

"No!" hissed Ursula. "You can't do this. I will scream if you do. The entire neighborhood will hear us and we will all go to prison." Francois and Pitor had by now pinned her father to the ground. Ian knelt down with the blade in his hand.

"Ian!" she hissed again, "you mustn't!"

"Quiet, Ursula." He turned to the men struggling on the ground. "Stop it and get up. I have this blade, I will use it if I need to. You must be quiet." The struggling stopped and the three men got up, disheveled and dirty. Karol had his arms pinned behind him.

"If you hurt her, so help me . . ."

"If you make any more noise, I will hurt *you*. Let's all be quiet, and finish a nice walk home, shall we? It is only just around the corner." The little group formed up, and began to move toward Karol's home.

Francois and Pitor frog marched Karol, while Ian took Ursula's arm, still holding the knife. Her heart was racing again, as she tried to figure an angle.

Karol stage whispered to Ursula. "Didn't I tell you getting involved would lead to no good. Didn't I tell you this piece of shit is no good? Did you listen to me?"

She felt Ian go tense, and he turned toward her father. "Papa. Be quiet. Please, he has the knife."

They walked along in silence for a moment, until Ian lowered his head to her, and asked, "Why didn't you scream?"

Her knees went weak, and she almost stumbled. "I just didn't. I didn't want you or Papa hurt. Didn't want to go to prison."

He nodded, and they continued to walk. Their home was just around the corner.

"You are not going to hurt us, are you, Ian?" She felt him stiffen slightly.

"No." He stiffened some more, turned and growled. "It's right up here. Not a word, Eeyore."

They rounded the corner and headed for the building. They began to cross the street, when a Grantville police cruiser came slowly around the corner at the far end of the block. It headed toward them, met them halfway across the street and stopped, blocking their way to the little house.

"Evening, Officer," said Ian calmly. "Can we help you?"

Ursula noted the officer was a down-timer, and actually quite small for a policeman. He looked familiar. He was looking them over carefully from his seat behind the wheel. Ursula watched him look at each of them, and his eyes settled on Karol. "What's wrong with him? He looks pretty pissed off. What is going on here?"

"Actually this is my Papa, Karol Volz." The officer looked as though the name didn't register. "You know, Eeyore. He works at the funeral home, building caskets. You certainly have seen him at funerals. He's had a little too much to drink this morning, sir, and these gentlemen were helping me get him home." She turned away from the police car, and looked to her father with pleading eyes. "Isn't that right, Papa?"

When Ursula looked at him, she saw the rage that was building inside him. "He just needed a little persuasion to come home tonight, right, Papa?" She turned back to the policeman, and smiled at him.

The radio crackled in the police car. "Patrol Two, this is Dispatch. We have a report of a disturbance with property damage at Monroe and Washington. Sounds like the Scotsmen have been partying at the Flying Pig."

The officer picked up the microphone and spoke into it. "Copy, Dispatch. Roll patrol one for backup, please." He turned to the group. "You folks get home. Gotta go." The officer turned on his red lights and zoomed away. As the car left, Ursula thought she saw movement in the shadows of the doorway to their place, as if someone had slipped in and eased the door closed behind them.

Ian turned to Karol. "Well done, old man. You too, my love. Now, into the apartment. Time to wake up Mama."

They filed into the tiny apartment, and woke Elsa. Karol and Elsa were bound together, gagged, and placed on the kitchen floor. They used cloth from clothing under repair, bits of rope and a halter or two snagged from a nearby barn, trussing up the Volz's very securely. They could breathe, but that was it. Ursula bent down in front of them. "Please be quiet. This will all be over soon. Please." The expression of rage in her father's eyes had become frightening to Ursula. She could never remember seeing this much expression on his face at any time. It was a consuming expression, hard and violent. Her hand went to her mouth involuntarily. She tuned to Ian.

"You're not going to hurt them. You mustn't." She was still whispering so as to not raise any alarm.

Ian sighed. "As I see it, we have a couple of options. None of them great. We could take Ursula as a hostage, to guarantee the family silence, but from what she has told me of them, I don't think we could depend on that. Apparently the relationship is not good."

Ursula turned and looked at her parents on the floor; she could tell her mother was sobbing. She could still see her father's eyes. They were still on fire. His body was quivering. She had never seen him with this much rage. She wondered where it came from. He never showed this much intensity over anything.

"The other option is to just kill them." Pitor and Francois both looked at Ian, and then at Ursula. Ursula was staring at Ian, her mouth open and her hand in front of it. She reached back and steadied herself against the wall. She saw him finger his blade. Her father struggled against his bonds.

"You can't." Ursula felt her knees go weak, and she slid down the wall to the floor. The last six hours had driven her to the limit of her emotional endurance. She struggled to stand, and her legs failed to respond. She started to sob. "No, you cannot do it. Please."

He pulled out his blade and held it to her throat. "Shhh, my love. Quiet." He stood quickly. "Tie her up too." Pitor and Francois mumbled their apologies, and started to gag Ursula.

Her mind was racing. How did she get into this? All she wanted was a little excitement, a little fun. She was exhausted. There was nothing more she could do. She looked at her parents, and started to sob again. As the gag reached her face, somewhere she finally found the strength to plead. "You were going to send for me, Ian. I thought you loved me?"

"Did you really think I would send for you?" He smiled his smile, and all Ursula could do was hate it now. There was nothing charming about it. "I have met some naive girls—it is part of this line of work—but you, you fell for it hard. It's refreshing in a way. Gives one hope for humanity."

"I believed you."

"At times I did myself." He shrugged. "*C'est la vie.*"



Pitor looked at her sadly, and started once again to put the gag into her mouth. She shook back the sobs. She had to try something-anything. "Wh-wait. Y-you are forgetting. Something." Ursula choked back another sob.

He held up his hand to pause Pitor. "What is that, my love?"

"If I tell anyone, I-I will go to prison. I'm not going to say anything to anyone about this. I can't. Think about that, Ian. I don't want to go to prison."

Pitor looked at Ian. "She has a point."

She looked at her parents again, bound with only their eyes watching her. She found more strength she did not know was there. "And if we are found dead, the police are not stupid. They will check the mansion right away. They will put it together with my extra time in the Department of Economic Affairs. Pitor said if they know what to look for; they will be able to tell the computer was on when I was there. They have radios. The police saw you take us here. You would never get away, no matter how many fast horses you have. Think about it, Ian."

Francois stepped forward in the small kitchen. "She has a point there, too."

Ian paused, put his hands on his hips and hung his head in thought. He looked at Ursula. Ursula looked at him, emotionally spent and exhausted, unable to move. He paced back and forth a couple of times in the small apartment. He began to nod his head.

"Okay. But, Ursula. If I ever hear about you mentioning this to anyone, I will return someday and end this. Do you understand?"

She sobbed again. "Of course. You have my word. Thank you. Thank you."

He turned to Elsa and Karol. "Do you understand?" Elsa nodded vigorously, and Karol just glared. "Eeyore, I think you need to understand what this means. You either go along with us, or I will have to kill you. Do you understand?"

After a brief pause that made Ursula's heart stop, Karol nodded yes.

"Are you going to call the police or turn in your daughter?"

Karol shook his head no.

"I have your word on this?"

Karol nodded again, and Ian stood up.

"Should we untie them," asked Pitor?

Ian looked at the anger still boiling in Karol's eyes. He shook his head. "No. Go ahead and loosen up Mama, but keep this Eeyore tied up. He still looks too pissed off. He needs time to settle down." He knelt in front of Elsa. "Mrs. Volz, my apologies." He shifted to Eeyore. "And Mr. Volz. You need to be more pleasant. Be nice to people once in a while. Especially your daughter. Smile. It may do you good." He stood. "Is there anything we are forgetting?"

"The traveling money," asked Pitor?

Ian looked at Ursula, lying on the floor. "Do you still have it?"

She nodded.

He quietly moved to her, and gently stroked some hair from her face. She recoiled slightly. "Keep it." In the darkness, she could see him smile. "You did good, kid." He looked at Pitor and Francois. "Any objections?"

They shook their heads.

With that, the three men left the room, and closed the door behind them. Ursula slowly collapsed onto the floor and lay at her parent's feet, for she did not know how long.

She awoke from her trance with a start, and sat up. Ursula could feel her father's anger was diminished. She was sure his discomfort was severe. She began to untie her mother first, when she heard a noise at the door. She could feel her father tense. For a moment she thought they had changed their minds, and were coming back to finish them. The door opened, and she could just make out a man with a knife. Her father saw him too, and started to struggle.

"Ursula, are you okay?" The voice had an unusual accent, Spanish and something else. Her heart leapt in joy, and she started to get to her feet, but fell back in exhaustion. Two more men entered the room, and more were out in the hall. She could tell they had up-time weapons. The first man knelt in front of her.

"Lorenzo! Am I glad to see you."

"And I'm glad you're okay as well. Are your parents okay?"

"A little shook up. Get Mama cut free, please." A grey dawn was starting to break over the hills. Several candles were brought in to lighten the room.

Someone pulled her father's gag out, about the time Lorenzo was helping Ursula to her feet. The room was so small, they could only have a couple of people working in there at a time cutting them loose.

Elsa was not happy with the sharp knives cutting the bindings made from her customers clothing. "Stop cutting the cloth! It is not mine, and I will have to repair it. Untie it, you idiot." She scolded the men in the dark clothing and was carried into the hallway to give them more room to work.

Ursula sat across from her father as Lorenzo went to untie him. She could see his eyes were still angry, but not furious as before. "First of all Papa, I want you to meet Lorenzo Nasi. He works for the government in counter-intelligence. He is my handler."

"Nice to meet you, sir. I apologize for not coming earlier. We had to be sure they were headed out of town. They're gone, computer and all." Lorenzo did not smile much, as he was always so proper. He continued to work on the bindings.

"This is the Jew you met in the alley."

"Yes, Papa. But I first met him almost a year and a half ago, right after I started at the mansion."

"You have known this Jew for over a year and a half?"

Lorenzo Nasi raised his eyebrows at Karol, and slowed his cutting of the bindings.

Ursula felt her strength returning. "That's right. Very good. You are very clever. Tell me the rest of it. What do you think?" Ursula knew this mental puzzle would calm her father.

He shifted slightly as a rope was cut, and tension was relieved behind his back. "That's better. I don't understand why they let those men get away. What did they do?"

Lorenzo chimed in. "They stole some top secret lists of our agents, all around Europe. Your daughter helped to steal them. From a computer, I might add"

Karol looked confused. "Why would you do that, Ursula? You should not be involved in such things. You should not endanger your family in such a way."

"Papa, please. Think about the files."

He paused for a moment. "That would be disastrous. We will have to move right away . . ." His voice trailed off. "You let them steal those files, didn't you? Those aren't the real files, are they?"

Lorenzo looked impressed as he cut another binding. "You were right, he is smart!"

Ursula sat back with a smile. "Told you he was. Except you almost messed it up, Papa."

He looked puzzled, then nodded. "I see. That's why you didn't scream when I tackled that smarmy English bastard. If the police had gotten involved, the whole plot would have been discovered." He looked at his daughter as more ropes fell away. He frowned at her and nodded his head. "But why couldn't you tell us what was going on?"

Ursula looked over at Lorenzo. "What is it called again? Operational security?"

Lorenzo nodded. "Yes. People only know if they have a specific need to know. With this much riding on the outcome of the operation, we just couldn't extend the need to know."

"After you attacked Ian, Papa, w-we just improvised. I assumed Lorenzo and his men were nearby the whole time, and they were. I don't think I could have done it without knowing they were behind me—us, actually."

"How did you know they wouldn't kill us," asked Karol?

Lorenzo shrugged. "That's one reason we asked the police car to delay you. To make sure they knew they could be identified. It gave us time we needed to get our team in the building. We also know Ian, whose real name is Maurice Rettanuer, and is originally from Alsace. Which is quite a way from England. He is a spy for hire, a 'freelancer' to use an up-time notion, but he has never killed anyone, as near as we can tell. No reason for him to start now."

Karol addressed Lorenzo. "If I ever get my hands on that son of a bitch, I am personally going to wring his neck." He shook his head so his droopy jowls swung back and forth.

"Well Mr. Volz, you will have to travel to France, or Spain, or wherever they sell those files. Although

they may be dead before you get to them, if the files are found to be bogus too quickly." Lorenzo cut another rope, and Karol could move his legs.

"Much better. I have feeling back in my legs," he said, with his typical matter of fact monotone. Ursula grinned widely at him.

Karol turned to his daughter, with just a hint of pride in his eyes. "But why did you do this, honey? It was dangerous. Too dangerous. You have never done anything like this before. Not even remotely like this. What possessed you? You became involved!"

"Papa, I have told you before. I don't want to live on the outside of the world any more. I want to be a part of it. A part of a community, not a parasite. I wanted to grow, to put down some roots. This was an opportunity to do both, and do some good for this place at the same time. So, when Lorenzo contacted me last year, and asked me to watch for someone to approach me about something like this, I had to say yes."

Finally Lorenzo cut the last of the ropes holding Karol, and they both helped him to his feet. He shook his legs and arms to restore circulation. He held out his arms to his daughter, and they embraced.

"Papa. You frightened me with your anger. And when you attacked Ian, I did not know what to think. It didn't seem like you."

Elsa walked quietly into the room with mounds of fabric in her hand. Karol looked at her, and they both nodded.

"It was me, Ursula. When you were young, there was a village that was destroyed. I could do nothing about it. I was tied up, and your mother was . . ."

Elsa joined them in a quiet embrace. "Maybe, someday we will tell you more, Ursula. That is enough for today."

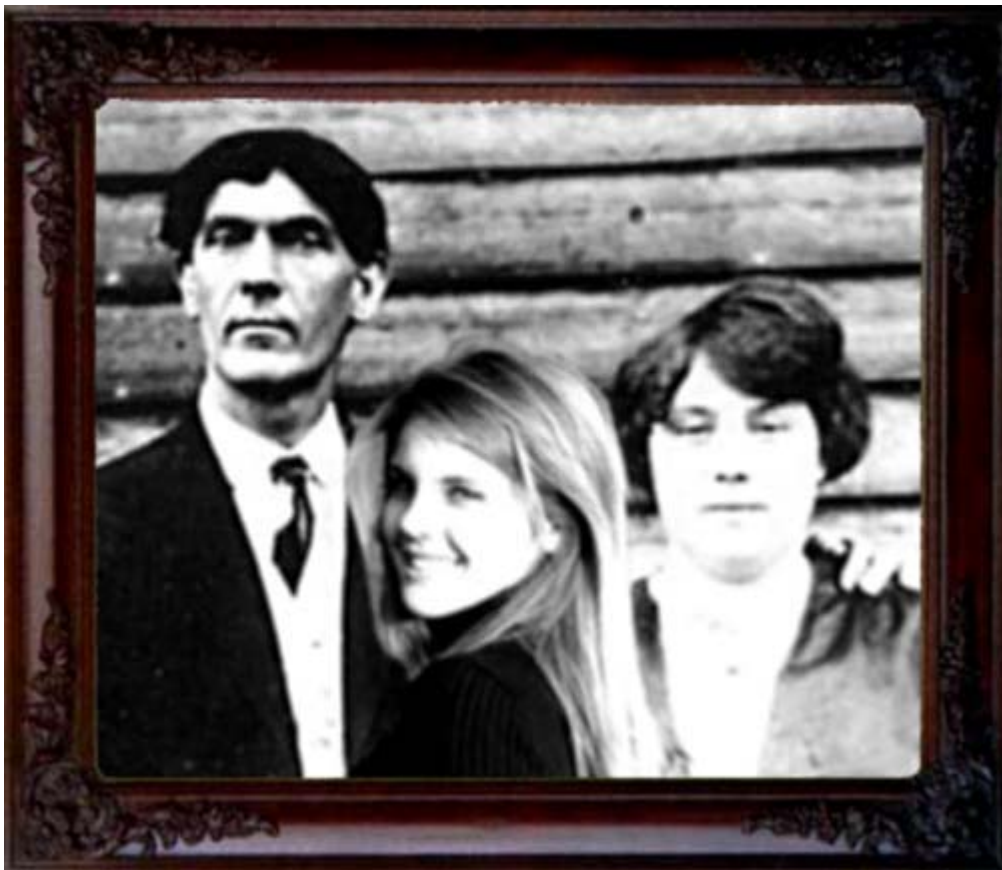
Ursula stifled a sob. "I never knew, Papa. But I don't want to leave here. It's safer here than it is anywhere. This can be our home. Please."

"I like it too. I have said it to you before, Karol. This is a good place," Elsa added.

Ursula looked into his sad droopy face, and hoped. The anger in his eyes flared for a moment, and he hugged them harder.

Karol sighed. "I suppose we could stay a while longer. Just to see how things go."

* * *



The Pitch

Written by Domenic and DJ diCiacca



Today the road was perfect, dry enough for wagon wheels but not yet dusty. Ian, who had sold a few of the up-time plows that were in the fields, was delighted. He had a new product in the wagon that he said was a surefire-couldn't-miss item, and he and Bert were going to revolutionize a different part of society, a part as yet untouched by the ongoing industrial and agricultural revolution. This far out in the country, a lot had not yet changed.

They checked off the inventory, made sure the two goats were firmly hitched to the back of the wagon, and slapped the mule into motion. Ian called "Up, Napoleon!" and laughed. Bert had no idea what it meant. Ian had picked up all kinds of up-timer phrases and ideas. But the mule's name was Oliver.



Three days later they were still on the road. They had yet to make a sale. Oh, they'd had fair luck with other, smaller farm implements, and farm bulletins and pamphlets and plans. Dream Farms Holding Company lampwork glass beads were doing especially well. But they had sold no washing machine kits, which was the larger part of their inventory. Ian was entirely upbeat. "Nothing to worry about. It takes time to develop a good pitch. A peddler hears 'no' a lot more often than he hears 'yes.' Once we sell the first one and word gets around, they'll fly off the back of the wagon. So relax, enjoy the ride, and enjoy the day. Life is short. Get happy. Everything is going fine." Ian was talking just to hear himself talk. Maybe he needed the pep talk as much as Bert did. Ian talked a lot, when he was inclined.

A smartass remark at the wrong time to the wrong people had cost Bert his tongue, years ago. While he could still make most sounds, he rarely said anything. He said even less now. He was grumpy. His butt hurt from sitting on the hard bench of the wagon, his feet hurt from walking, and his head hurt from the frustration of watching Ian make his pitch. In Bert's humble opinion; nothing was more tightly fisted, closed minded, mulishly stubborn, or suspiciously grim than the people in the little towns and hamlets like the ones they kept passing through.

Ian was the salesman, or peddler, or drummer, or bullshitter, whatever anyone wanted to call it. He seemed to like everybody he met. That was fine.

Bert was security. He was the muscle. This meant Bert did all the work while Ian talked. Ian talked, and Bert fed the goats. Ian talked, and Bert unloaded things from the wagon. He put the demonstration model together, if they got that far, and he went for water, and did every other damn thing, like unhitching the mule and setting camp or handing Ian the right display model or illustration, or mug of beer. All the while, Ian talked. And it didn't do a damn bit of good, as far as Bert could see.

Ian thought otherwise. He talked about weather, and war, and seed crops and hay, and tough times past and good times to come, and the hopes and fears of the average Joe. He avoided talk of the court, and politics, and religion, which of itself was a wonder, but probably a necessary one. He softened the waters for future sales of scissor cutters and hay rakes and hand tools and farm gadgets of all kinds, and he planted seeds of his own in fertile ground when he got the chance. But somehow or other, whenever he broached the subject of the washing machine he got stonewalled. Froze out. Stopped cold.

"We've got a laundry." Some communities had a communal laundry.

"My wife washes my clothes. She does just fine." Never tell a man to go ask his wife. About anything.

"We have a river right over there. What do we need that gadget for?"

"We just don't need it."

"It costs too much."

"Are you saying my clothes are dirty? You sayin' I stink?"

One time they had back-peddled right out of town. Mostly they were treated fairly, and they were listened to, and they were given a polite 'no.' Even when they were enthusiastically received and did well with the other products, they received a firm no when they got to the washing machine. Mostly Ian talked to the men, while the women looked out of doorways and held the children back. Bert, of course, stayed silent.



Sometimes Bert juggled, and often in the evening he and Ian played penny whistles, and drank beer at the local pub, and made a few more sales—and probably a lot more future sales, according to Ian. But they sold no washing machines. Twice they were allowed to set up and demonstrate, and women watched and men stood about with sarcastic expressions, and children teased the goats and had to be scolded by apologetic parents, but after all the fuss and bother and activity, nothing happened. Ian was untroubled by this. His plan was to travel out for two weeks, planting seeds, and then turn around and retrace their steps, reaping harvest.

Bert had his own opinion about the plan. But over the next week, they worked up an act, and Bert began to enjoy himself, and they were more and more allowed to set up the demonstration model.

They would pull the mule to a stop in the middle of some dozen or two buildings, sometimes haphazardly placed, sometimes organized into a tidy square or main street, and Ian would introduce himself and comment about the weather and pass on whatever news they had picked up in the last little hamlet. Bert would look about for the nearest mud puddle and promptly trip over his own feet and fall into it. Or he would drop something heavy on his toe when he was unloading the wagon, and pinch his fingers while setting up the demonstration model. Once a goat nipped his ass, and they worked it into the act. Ian talked, and Bert did shtick, and he always did his best to make it look unintentional. He pantomimed with increasing skill, and he exaggerated his muteness, and when people laughed it made him unreasonably happy. Ian seemed satisfied, too. They enjoyed themselves, they made a profit, and they moved on, but

they sold no washing machines.

They passed through the last little hamlet on their itinerary one lazy spring afternoon and a few hours later settled into a campsite where they would remain for three days. They fished, they sparred, they honed their fighting skills, they practiced with their penny whistles, they slept and they talked. Well, Ian talked. They tethered the critters on good pasture, they rubbed the mule down and checked his hooves and legs, they patched and greased tack and harness and wagon wheels, and they generally passed the time. Then they did a fresh inventory, hitched up the mule, tied the goats to the wagon, and started back. They passed through the same little hamlet without stopping, and without comment or incident.



Late that afternoon they reached the next, and they were spotted long before they reached the first building. They drove into the middle of town and found the road blocked by two men; men they had drunk beer with and shared news and gossip with, men who had been friendly when they parted. Now these same men stood with arms folded and dark scowls on their faces, blocking the wagon. When Ian pulled Oliver to a halt, other men emerged from various buildings to close off retreat. More joined the ones in front. Grim-faced women stepped out from doorways, or looked out of windows, determined and resolute, hands on hips or holding heavy ladles. One woman had a beauty of a shiner around one eye. She had a definite attitude and a heavy iron fire poker in her fist. She glared not at Ian and Bert, but at one of the men, most likely her husband. One of the angriest looking men had a dark bruise along one cheek.

Ian tied off the reins and sat up straighter, wearing his poker face. Bert, if he had a tongue, would have bitten it. It took every effort and a really hard self-inflicted pinch on his ear to keep from grinning. Grinning, he was sure, could be bad. They were on the verge of a riot.

Ian, his eyes flat and his face blank, leaned slightly toward Bert and spoke out of the side of his mouth. "Looks like we're about to make a sale."

And Bert figured it was true, and he pinched his ear again and bravely kept even a hint of a smile from his face. Later, perhaps, it would make a great story. But not now. When a dozen or so angry men surround you, it's best not to laugh just because they're not wearing trousers. And it was clear as sunshine that none of these men were going to be wearing trousers again until those very trousers had been washed in a reasonably priced, assemble-it-yourself, newfangled, goat-powered washing machine.

* * *

Signs

Written by Gorg Huff



"God damned piece of shit." The words came from under the automated money changer in the First National Bank of Grantville. And Reva Pridmore suddenly knew it was going to be a bad day. The AMC, or Simon Legree as the bank employees called it, was the unnatural child of two coke machines and a personal computer. It ate down-time coins and spat out dollar amounts. It also spat out the estimated silver content of the coins in question and sorted them into neat stacks that depended on the type of coin, the amount of wear and clipping they had suffered. And, as it had today, it broke down a lot. Well, Reva had had enough. The tellers had a lot to do these days; weighing coins by hand would mean long lines. She turned on her heel and headed for the offices.

"Marlon, we're not going to do it. Not again," Reva said as she entered her husband's office.

"Do what?"

"Simon Legree is busted again. I'm not having my tellers spending the day weighing and measuring coins."

"I surrender, I surrender." Marlon held up both hands but ruined the effect by grinning at her. Apparently seeing her expression, his grin faded a bit. "Let me look, okay?"

Reva crossed her arms and waited, while Marlon fiddled with his computer. There was talk of consolidating the computers in the bank but on December 7th, 1631 it hadn't happened yet. "Wow. I didn't realize we had that much silver coinage on hand. Look, honey, why don't you just put a sign in the window saying we aren't buying down-time money today. We have plenty. We could sell down-time money for a week before we had to buy more."

Now Reva smiled. "Fine. I'll have Ditmar do up one in German." Ditmar had a fine hand. Unfortunately his English wasn't great; Reva's German was worse.

* * *

"*Ja*, I will sign make. Is good." Ditmar said. He was pretty sure he understood what was needed. He didn't like weighing coins any more than any of the other clerks in the bank. He didn't see any reason to include an explanation of why. What was more important was that the text be large and easily read. So he made the letters three inches tall.

Ditmar stood outside examined the signs and gave a sharp nod of satisfaction. The signs were placed on the large window next to the glass door. Frau Pridmore's sign was made in magic marker and the typical up-timer scrawl:

WE APOLIGISE BUT THE BANK
WILL temporarily NOT BE BUYING
DOWN-TIME COINS. You can still
exchange up-timer money for
local coinage.

*Kein Ankauf von Silber.
Verkauf nur gegen up-time Dollar
zum aktuellen Kurs.*

Ja, that would work. Neither the English version of the sign nor the German gave the reason that they weren't buying down-time coins. But that really wasn't anyone else's business anyway. The German sign failed to specify that it was temporary, but so what. The English sign did and they would take the signs down when the machine was working again. What mattered was that both signs made clear that you could still get down-time coins at the First National Bank of Grantville; you just couldn't get rid of them there.

* * *



Jekli Koriska, a merchant from Silesia, had sixty gulden, in HRE coins of various denominations, to deposit in his account in the Grantville Bank. They'd been sent to him by his partners back home, after they had sold a load of kitchen appliances that he had sent to Prague two months before. While not overly fond of the New United States, Jekli did like the bank. It was a really nice place to visit, with carpet on the floor and great big windows and central heat. It was a biting cold morning, in spite of the cloudless sky. He moved cautiously over the icy sidewalk. Then he looked up and saw the sign in the window of the bank. His first thought was annoyance. He would have to go to the Exchange. Then he remembered the stories about the up-timer techniques for turning copper into silver. He hadn't believed them; they were altogether too much like the philosopher's stone that alchemists and other charlatans were always searching for. After a moment, he thought about the stories in *The Street* about the balance of trade. He looked back at the sign and began to be a little worried.

* * *

Jekli stood in line waiting for a clerk of the Exchange to weigh his coins. That was the other reason that Jekli disliked the Exchange. It was an open market, lots of people buying and selling lots of things. But before you could trade, you had to document that you had something to trade. Be it stock, money or apple futures, you had to provide documentation that you owned it. So exchanging his coins would be a two step process, first having them appraised and getting a note, then going onto the floor and looking for a buyer.

He looked at the big board. Jekli neither knew nor cared how it worked. He just knew it was connected to the Exchange computer and that it kept a running total of the prices for anything that was traded on the floor. The rules of the Exchange required that each trade be recorded. The American dollar was trading at \$148.50 to the guilder. Guilders were down a little from last week, but not too bad. Other down-time coins were also down a touch against the dollar. Turkish coffee was going for \$23.00 a pound, chocolate for \$32.00; puddled sheet steel \$19.24 per pound. The puddled steel sheets were down a bit, which should decrease the cost of manufacture for knives. Swedish garcopper \$105.67 per pound; Hamburg sheet-copper \$121.76 a pound; Saalfeld copper sheets for \$75.15 a pound. He wondered why the Saalfeld copper was so low. He didn't even look at the grain or cloth prices.

The line was getting a bit long behind him as he waited. Apparently, he wasn't the only one waiting to have coins weighed. He looked back at the cage and noticed that a second clerk had arrived and was talking with the first. Then the second clerk spoke. "Ladies and gentlemen, would those of you who are having coins assayed form a line to the right?" He indicated a second window. People on the floor were looking at the line and Jekli was starting to feel exposed as he moved to the right. So did most of the rest of the line.

"Were you at the bank?" The man behind him asked.

"Yes. You?"

"Yes. What do you think is going on?"

"I don't know." Jekli hesitated looked back at the big board, then asked, "Do you know anything about that electric process for turning copper into silver?"

"What? I thought that was just an improved way of refining copper."

"Oh," Jekli said, relieved. "I had heard that it turned copper into silver." He turned back around, not noticing the expression on the face of the man behind him. By the time it got to the back of the line, the rumor had it that electrolytic conversion would turn one ounce of copper into one ounce of silver or as close as makes no difference. It wasn't the only rumor that started in that line.

By the time Jekli got his coins assayed a guilder was only bringing \$140.00. By the time he found a buyer on the floor all he could get was \$130.00. He almost didn't take it but he needed the dollars to buy steel knives.

* * *

On the Exchange floor, people had noticed the length of the line. Rumors started circulating. After hearing a few, Abel Abrabanel, the young man who was acting as agent for the Abrabanel's went to make a phone call. Badenbug didn't have a telephone exchange yet. The message had to be written down and hand-carried to Uriel Abrabanel's place of business. Then Herr Abrabanel would decide what to do,

write another note and send it by runner to the telegraph and telephone office. Abel had to wait through all that to get an answer back. Meanwhile, on his own authority, he stopped buying down-time coins. If something was going on that would seriously drop the price of silver, he didn't want the family to take any more of a loss than could be avoided. His report was supposed to be in code, but Abel was young, worried by the rumors, and in a hurry. He didn't stop to encode it. Such messages were also supposed to be private. But people are people and the messenger boy who took the written message to Uriel Abrabanel was padding his income by providing the occasional tidbit to Reynfrid Drescher, a reporter for the *Daily News* .

Reyny to his friends—and Renfield behind his back—had the information before Uriel did. Uriel did encode his response, so Reyny didn't get the orders from Uriel. Besides, truth be told, what Reynfrid Drescher knew about money and how it worked could be written on the flap of a matchbook with room to spare. Reyny was an entertainment reporter. But he wasn't one to share a lead. He headed for the Exchange to see what was going on. He had a deadline to meet.

By the time he got there, the panic was at full speed and the Abrabanel agent wasn't buying. He wasn't selling either, Reyny noted. Reyny listened to the rumors. The one about turning copper into silver. The ones about balance of trade. Two about new silver strikes in different locations. But he was a good reporter. He learned about the bank not accepting silver coins and went to find out what was going on. At the bank, no one knew why the Exchange was going crazy. When he asked about why they weren't buying silver coins he was told about Simon Legree's breakdown. And that the machine would be working again in the morning if all went well.

* * *

He phoned in the outline of his story and headed back to the Exchange. He still wondered why the Abrabanel's weren't buying silver. By the time he got back to the Exchange, Uriel Abrabanel had arrived—not that he was doing anything. When Reyny asked him why, Uriel's response was, "What should I do?"

"Buy silver coins! Didn't your family promise to keep the American dollar stable?"

"We probably will buy once they hit bottom, but, as you can plainly see, silver coins are still falling. All we promised to do in regard to American dollars was to buy them at two hundred to the guilder. If you happen to have \$200, I'll be quite happy to sell you a guilder for it."

Reyny looked over at the big board that showed the prices of various currencies and saw that he could buy a Dutch guilder for \$87.50. "No, thanks."

Uriel Abrabanel smiled. "How about \$150? No?" He shrugged. "We've been expecting something like this." Reyny didn't know that Uriel's "we" included Balthazar, Rebecca, Uriel and some of the members of the Finance Subcommittee but not Coleman Walker. Which would have been a nice embarrassing tidbit for his story and done Coleman's reputation no good.



"We weren't sure when it would happen and we weren't expecting it to be this extreme. But the American dollar has been undervalued since the up-timers arrived. Look at the price of refined silver. \$105 per troy ounce. It's been dropping all morning along with the coins. Gold is down, too, because if you want to buy something or need to pay a debt here in Grantville, it's dollars you need. What's really happening is that the American dollar is rising, finding it's place. Adam Smith's invisible hand at work." Reyny didn't have a clue who Adam Smith was but he didn't interrupt. He would look it up later. "Forty-five guilder's will buy you a hundred pounds of Hamburg sheet-copper or a hundred and fifty pounds of American copper sheet bought in American dollars. The American copper sheet is purer copper of more consistent width. No amount of guilders, unless they are first converted to American dollars, will buy the dental work you can get in Grantville or a hand-cranked deli meat slicer, and who knows what American dollars will buy next week?"

"A process for turning copper into silver, perhaps?"

"No. I have been assured that such a process is beyond even the up-timers. What they do have is a better way of refining copper and there is a tiny amount of silver in the copper we use. Which they are, or will soon be, extracting from the sludge of the new refineries. As I understand it, what they have now is a pilot plant. Which is still producing decent amounts of refined copper by our standards."

* * *

"What the hell is going on over at the Exchange?" Coleman Walker asked as soon as the office door was closed.

"Insanity! There is some wild rumor that the bank won't accept down-time coins anymore." Horace Bolender was clearly no more pleased than Coleman was.

Phil Hart looked back and forth between them. "Ah . . . Horace, did you see the sign when you came in? The one in the window of the bank?"

"I saw two or three signs. I didn't stop to read them. Why?"

"Well, Simon Legree is busted again and we're flush with down-time currency at the moment." Phil paused at Bolender's blank look. "The automated money changer. It sorts the coins we get by weight and volume, which is a pain to do by hand. So we're not buying down-time money until it gets fixed. It's not a big deal; they have a machine pretty much just like it at the credit union."

"Did the sign in the window mention that?" Bolender asked.

"I don't know." Phil admitted.

* * *

"Yesterday there was a run on the American dollar," Reynfrid Drescher's article began. It went on to describe what the series of events had been. He debunked some of the rumors and clarified others. He talked about the economic indicators like worker productivity and dropping transport costs. Then he ended with the following, "A lot of people got caught out yesterday. They got caught out because they thought silver was money and paper wasn't. There have been signs ever since the Ring of Fire that this wasn't the case. Signs and portents all over the place. If you're going to avoid losing your shirt, you're going to have to learn to read the signs. And not just the ones in the window of the Grantville Bank."

* * *

Jekli Koriska sat eating breakfast and reading the paper. Reynfrid Drescher's article was front page above the fold. Jekli sipped his tea and cursed under his breath. He had lost over a thousand American dollars yesterday, around eleven guilders at yesterday's close and it could have been worse if he had waited. He was going to have to raise his prices. Which wasn't going to thrill his partners. The kitchen knife sets he bought here in Grantville had been amazingly cheap. They would still be cheaper than a blacksmith could make them for, since they were stamped out of sheet steel produced by a process called wet puddling. And the handles were made in jigs using Black and Decker power tools from up-time. They were top quality knives made with real high—well, medium—carbon steel. And incredibly cheap to make. Just not as cheap now as they had been day before yesterday.

He'd called his supplier after he made his deposit at the bank. He'd asked if they would be lowering the price since the dollar had gone up so much. They had told him no, at least not for now. The iron used in these knives was already bought, so was the wood and the brass rivets. Nor were they going to go to their employees and ask them to take a pay cut because the dollar had gone up. "I've got a union to deal with," he'd been told.

Having finished his breakfast he pulled out a pen and began to write.

Dear Klaus

The up-timers are waking up to the value of their products, if in a roundabout way. You may already know from the radio that the guilder and the thaler, in fact all silver and gold coinage have dropped against the American dollar. From the things I hear locally it seems unlikely that this is just a temporary fluctuation.



I know in the past I have been opposed to investing in a steel puddling plant but I am beginning to reconsider. Our business is still profitable but not nearly as profitable as it was before. What concerns me still is that after investing the money in a puddling plant that someone will build a Bessemer or introduce crucible steel production. As I have written before, they are working on both methods as well as electrical smelting. I wish things would stabilize so that we might make solid predictions. But for now, at least, we must ride the tiger. The notion of buying sheet steel here in Grantville and making our own stamping mill still won't work. It's cheaper to ship the knives, which is another reason to delay. The puddling plant would still need a stamping mill, annealing ovens, grinders for the final shaping and sharpening. I grant there would be significant savings on labor. What they pay common laborers here is an outrage. And with the increase in the dollar, it's even more of an outrage now than it was yesterday.

Very well, then. I am still ambivalent about it but if you and the others still wish it, I will send you the plans for a puddling plant, stamping mills and the rest.

Meanwhile, send me money. The American dollar is a good investment in itself. I will deposit the funds in the bank here and we will be at least somewhat protected if—say rather, when—the dollar goes up again.

Jekli

* * *

An Irish Sitter

Written by Terry Howard



Augsburg, September 1634

"Horatio Alger Burston, this is totally unlike you!" a rather exasperated Catharina said. She would very much have preferred for her new husband to leave the hiring of staff completely up to her as he always had before. Well, almost always, anyway. For some reason she never understood he had insisted that the head cook had to be French, and that he—yes, it had to be a man—was to be referred to as "the chief,"

like the Indian leader in the movie they saw at the Higgin's Hotel in Grantville the one time he took her to his home town.

Then again, when she chose the carriage driver he wanted an Englishman named James but he hadn't insisted on it like he was doing now. It was well and good that he hadn't insisted on it since there was nary a James to be found. He had nothing to say when she hired the chamber maids and her personal maid. When she hired his valet, his only comment was to laugh when he found out he now had a valet. When he quit chortling all he said was, "Well, that's service for you." She asked what he meant but he never did manage to explain. Sometimes up-timers could be so completely incomprehensible.

But, now, for some completely inexplicable reason, he was insisting on having his own way on the question of hiring a nurse for their youngest child. Little August was Horatio Alger's stepson and he was two and a half years old. She was expecting again so it was time and past to hire a nurse. With the third child coming she would have less time and the children would have completely different needs. She very much remembered the troubles she had when Casimir was jealous of his baby brother.



When she proposed bringing another member on staff Horatio muttered something about a live-in babysitter. Then he smile that smile that he'd been known to call "a shit-eating grin," and said, "That's fine, dear, as long as she is Irish."

"Irish?" Catharina was truly puzzled. "Why do you want an Irish nurse?"

"Well, the Irish speak English with such a delightful accent."

"That is an absolutely ridiculous reason to choose a staff member. Besides, where will we find an Irish nurse? Now, there are any number of fine healthy young German girls to hand to choose from."

"Nope. If you want a nanny, she is going to be Irish," Horatio said.

"But, darling, be reasonable. Where will we find her?"

"I don't know. But, I'm sure you'll manage. If you don't then I guess August will just have to make do with the walking stick on hand instead of his own private nursemaid."

Catharina knew what he meant. This was one oddity he had managed to explain. A walking stick was a staff so the staff collectively was a walking stick. "But dear," Catharina said, "I've found this perfectly marvelous—"

"Nope."

"But—"

"Nope."

Well, that was the third time he said no and the soup was still on the table. Catharina knew when to back off. She waited for desert before she brought it up again. "Horatio, Chef Andre's paramour has a niece visiting from out of town and she is looking for a position for the girl. I've met her and she seems such a lov—"

Horatio cut her off. "We already have more staff than we need. I have no idea what the chamber maids do all day. Reclean already clean chambers, I guess. We aren't running a home for wayward girls here. I'm sorry, but tell her no."

"Well, we were thinking of her as the nurse."

"Is she Irish?"

"Of course not."

"Then the answer is still no. If you can't find an Irish nanny then you will just have to raise the kids yourself."

"Don't be ridiculous. That is simply impossible."

"My ma raised six kids, kept the house clean, did all the cooking and worked part time. I don't see what you're complaining about."

"I meant finding an Irish nurse, not raising the children."



"Well, impossible or not, if you get a nanny, she will be Irish. I gave in on an English driver named James because we had to have one right away since neither of us can handle a team of horses, much less harness them. But this is different. You've got all the time you need to look for what we want, so it's an Irish nanny or no nanny. Oh, and see to it that she has dark red hair."

"Horatio? Just what is this all about?"

"It's about hiring a nanny."

"No, it isn't. If it was, then any healthy, steady, lass would do."

"Well, maybe I want another somebody about the house who speaks English as a first language."

"Then you don't want an Irish. If they speak English, it's a second tongue."

"Really? Then what do they speak?"

"Irish."

"Is that a language?"

"Yes."

"Oh."

"So then, if she doesn't speak English as her mother's tongue it will be all right to hire a—"

"No!"

"No?" Catharina almost wailed in frustration. "Why not."

"Because I want an Irish nanny for my son."

A completely annoyed wife demanded of her absolutely irrational husband, "But why? Give me one good reason!"

"Well, an Irish nanny is romantic."

"*Oh!*" Catharina lost it and it showed in her slipping English grammar. "So the true comes at last. You want an Irish mistress."

Horatio laughed. Catharina shook with anger. Horatio laughed louder. When she realized it wasn't going to work she changed to a pout and Horatio laughed with renewed vigor.

At last he ran down. "No, my dear," he finally said. "But there is a toast my father taught me." At that he raised his wine glass and said, "Here's to the happiest days of my life, spent in the arms of another man's wife." He paused for her to blow up, which she did. As she took a deep breath the better to cuss him good and proper like, he concluded the toast with the words, "my mother."

As the meaning of what he said filtered through the red haze of fury, the power went out of the gale force wind which was lodged in her lungs.

"If my son is to have a love in his life to rival that of his mother, then it should be someone special, exotic, beautiful, unique, someone who has a chance of competing, not something he can see by the dozens passing in front of the house any hour of the day. Anything less is not fair to him, or her, or you."

Suddenly Catharina not only lost the steam she had for a good screaming fit, she also lost any momentum she had for the argument. Horatio's id quietly congratulated his ego on a very good save.



"But, where will we find such a person?" Catharina asked.

"I'm not sure you can, dear, but do your best."

"Horatio . . ." Catharina suspected that she was somehow being swindled. Still it might be as he presented it. After all, American's had some really strange ideas. "Are you sure this is the reason?" She hadn't completely let go of the idea that he was the one who wanted a lover.

"Okay, I admit it," Horatio said, throwing his hands up in a theatrical gesture. "I've always wanted an Irish setter." Then he laughed.

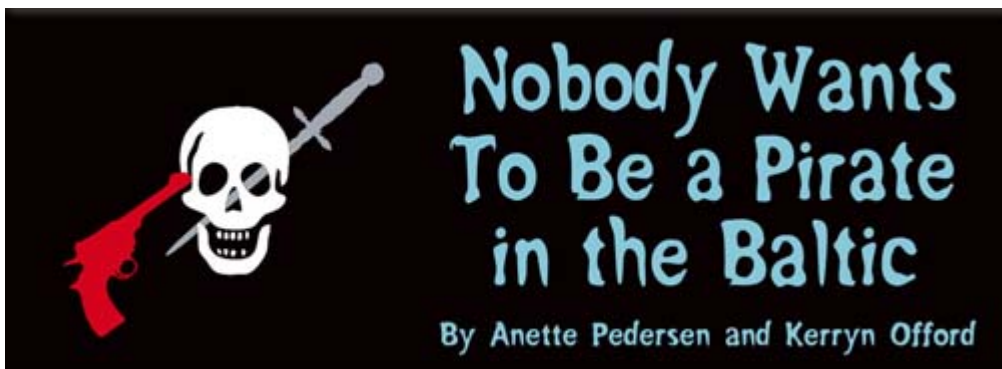
"What is an Irish setter?" Catharina demanded.

Horatio never did manage to explain.

* * *

Nobody Wants To Be a Pirate in the Baltic

Written by Anette Pedersen and Kerryn Offord



Kolberg, Pomerania, March 1635

"Viktor not have all day"

Hans Johansson jumped and nearly dropped the musket he gingerly held in his soft, white hands when the gravelly voice broke the silence. He'd been so busy examining the musket that he'd momentarily forgotten Viktor, though, as he glanced at the big brute of a man with his barrel chest, gray hair, and badly pockmarked, battle-scarred face, he had to wonder just how he'd managed to forget the man was waiting for him to accept the consignment of weapons. Even when he was just standing still, there was a brooding intensity about Viktor that was more intimidating than his physical presence warranted.

"I'm sorry. Is . . . is something wrong, Herr Viktor? These are very fine guns. I'm most impressed that

you've managed to acquire so many of the new Russian AK3s. They only went into production last summer." To his annoyance Hans realized that he was babbling.

He wondered if he needed to make eye contact, if it would make him seem more sincere and trustworthy. He had forced himself to do so when this deal was set up and it hadn't been something he had enjoyed. On the surface Viktor looked like any other thug, but there was something about the fire in Viktor's eyes that was scary. Something not quite right. No, eye contact wasn't necessary. Hans was sure he had Viktor convinced that he was just another harmless clerk handling his master's dirty transactions, and it wouldn't be a bad idea to let Viktor think that Hans was somewhat scared of his violent reputation. That Hans had spend the last three years looking for revenge against the powerful Vasa family for the loss of his heritage, and was now one of the duke of Courland's most trusted agents, was not something Viktor needed to know. Especially since the duke's new mission might bring Hans into more contact with Viktor and his men.

"Viktor's weapons is good. Why you take so long?" The big man folded his arms over his large chest, and frowned. Hans was acutely aware that he had his back to Viktor's henchman standing by the pile of gun crates, and that the two guards at the cellar door were now looking in his direction.



With an effort Hans returned his attention to the musket in his hands. It was, as Viktor had promised it would be, a used weapon, but in very good condition. That was something Viktor's reputation had promised. When you bought from him, you bought weapons you could rely on. He didn't deal in rubbish, and he didn't try to palm off damaged weapons as useful ones. On the other hand, he was also rumored to be willing to go to any length to get revenge for a betrayal, real or imagined, and Hans had no intention of telling Viktor all there was to know about the mission. Still, there was no one else capable of carrying it off who might also be willing to do it, so Hans knew he just had to out-smart the big man.

"They are very good, Herr Viktor. In fact they are exactly what you promised." Hans plastered an ingratiating smile on his face, and managed to look somewhat like the apple-cheeked Swedish boy he had once been.

"Viktor keeps his word, and others better keep theirs to Viktor." The scarred face looked even more evil twisted by a dark frown, and the thick Russian accent grated on Hans' ears.

"Surely no one would try to cheat someone as noto . . . eh, noted for fair dealings as your honorable self, Herr Viktor." Hans gave a slight bow, and handed Viktor a purse containing the exact number of gold coins as they had agreed upon.

"Not twice. No, not twice." Viktor bounced the purse in his hand a few times, and stuck it into his belt without counting the money.

"Surely not even once, Herr Viktor. Why even my illustrious master knows of your reputation. He has, in fact, empowered me to approach you concerning another deal."

"For what?"

"As you know, there are many new weapons being developed more or less secretly in various places, and it has come to my master's attention that a weapon of significant military value will be traveling from Wismar to Stockholm within the next couple of weeks. My master wishes to acquire this new weapon, but speed is essential."

"Why you need Viktor?"

"I lack your organization's sources of information and connections. The Doppels have intense security surrounding the transportation of the new weapon and I am at a loss as to how to obtain it." Hans tried another smile and a bow.

"Johann and Georg Doppel from Gothmund, Luebeck?" Viktor's speech was suddenly faster and smoother, making Hans wonder if he'd been playing games with him.

"Why, yes. Do you know them?"

"Viktor knows of them. For the right price Viktor will do it. From Wismar to Stockholm, you say? First Viktor will need a good ship and crew."

"I already have a ship and crew ready and waiting to take the weapon back to my master."

Viktor shook his head. "Viktor wants his own ship and crew."

"The captain is my cousin, and my master has already agreed," Hans insisted.

"Viktor has your word your men are to be trusted?"

"Of course," Hans answered.

"Then we discuss Viktor's price to get your master his weapon system."

The Vulgar Unicorn, Stralsund, a couple of days later

Tat'yana's nose twitched at the strong smell of sex in the air of Victor's room. She paused to examine the child, for child was what she most definitely was, that Viktor had been amusing himself with. She was standing there in her threadbare clothes, staring nervously back at Tat'yana, twisting the drawstring purse Viktor had thrown her. Tat'yana called over her shoulder. "Boris, get this girl a coat from the bag and see she's given something to eat before she leaves."

"No, Boris, you stay." Viktor waved towards the second man who had entered the room behind Tat'yana. "Grigori, do what Tat'yana said."

Tat'yana waited until the door was shut behind Grigori and the girl. "She looked young even for you, Viktor."

"Yes, the sweet little flower has barely started to bud," Viktor answered, "but I wanted to celebrate with a virgin." He looked over to Boris. "We have been given Johann and Georg Doppel on a platter."

The grim smile on Boris' face had Tat'yana wondering. "Who are Johann and Georg Doppel?"

"It's a long story," Viktor began.

Tat'yana settled herself comfortably on the bedside chair. "I've got plenty of time."

"It was back when me and Viktor first started dealing in arms. We thought we had a deal with honorable men . . ." Boris said.

"But we were wrong," Viktor interrupted. "The written contract they produced did not say what they claimed it had said."

This was news to Tat'yana, and it explained why Viktor and Boris had so readily accepted her into their inner circle six years ago. Not only could she read and write, but she also owed Viktor for rescuing her from the back streets of Paris. She was his way of ensuring he wasn't cheated on a bad contract again, which brought up another question. Viktor wasn't the kind of man to let a wrong go unpunished so long. "And you haven't done anything about them yet?"

Viktor snorted. "Not yet. We couldn't do anything ten years ago. We were short of money and the Doppels had powerful friends. Until now our paths haven't crossed." Viktor glanced over to Boris. "But now I will have justice."

"Don't they still have powerful friends?" Tat'yana asked.

"Yes, but they will be on board a ship. It will be a simple matter for them to be lost at sea."

"Murder on the high seas?" Tat'yana asked.

"Not murder, Tat'yana. We are not pirates. Nobody wants to be a pirate in the Baltic. There is nowhere to hide. No, I only seek justice," Viktor answered. "Do you know where to find Lasse?"

Tat'yana nodded. "He's working the docks here in Stralsund."

"Good. Bring him to me. I have a special job for him."

Viktor turned to Boris. "Hans Johansson says he has a ship and crew. Its name is the *Dunking Dolphin*. Learn what you can about them while I find out what I can about the Doppels' ship."

The Harbor, Stralsund

"Hello, Cookie. Wanna turn a trick?" Lasse turned around at the rough voice, and saw his old friend Tat'yana standing with her hands on her hips, and her head slightly tilted in a come hither pose.

"Tat'yana, what can I do for you?" Lasse rose gracefully from the bollard he had been sitting on.

"Viktor has a job that needs your special abilities."

"Horizontal or vertical?" Lasse's sweet smile never reached his eyes.

"Getting to be quite a fancy speaker, eh?" Tat'yana normally preferred to speak and dress as a respectable middle class German, but that would have made her a target for every predator on the Stralsund docks. Today she was a full-blown dockyard-doxy and, despite her small stature, someone even the most drunken sailor wouldn't harass.

"I've been keeping company with a priest lately." Lasse shrugged. "In between bemoaning his sins, and praying for his soul, he tries to convince himself that he is actually trying to save me by preaching to me and teaching me. I've lost most of my Swedish peasant accent, and learned quite a bit of Latin. Not quite enough to pass as a priest, but . . ." Lasse shrugged again.

"It's good to be as many persons as possible." Tat'yana looked across the pier to the sea. "Then you can afford to stop being those you don't want to be."

Lasse didn't answer. He had been happy and proud to have reached a position as second cook in Princess Kristina's household at the royal court in Stockholm, but being accused of trying to poison the princess had broken his dreams, and what he'd had to do to escape had broken more than that. Someday Lasse intended to find out if Jan Potocki had been the reason the queen had been so unwilling to accept that Lasse simply hadn't noticed the cracks in the tinned beaker he had used to serve the tisane to the princess. The queen's new favorite had certainly been quick enough to offer to arrange Lasse's freedom from jail in return for Lasse's "services."

"Viktor wants us to leave for Wismar today. We must be onboard a certain ship when it leaves the harbor there. You as a cook, me as a passenger. Are you in?"

"Sure." Lasse smiled. "Viktor pays much better than the priest, and he doesn't expect freebies."

The Vulgar Unicorn, Stralsund

"I have accepted a job," Viktor growled at Lasse as he and Tat'yana entered the suite of rooms that was his permanent base. "Tat'yana and Hans Johansson, our employer's man, will sail as a married couple on the *Martha of Wismar*. You will take the place of the cook. One morning Tat'yana will tell you to poison the food. Then I will come with a ship and a crew, and we will take what is on board."

"Piracy?" Lasse sat down and stretched his elegant legs out in front of him. "But nobody wants to be a pirate in the Baltic. It's much too cold."

"Not piracy. This is justice. Two men who cheated me many years ago will be traveling on this ship. It is their cargo we will take."

"Ah, and will the crew be Fritz Felix and his men?"

"No." A frown twisted Viktor's scarred face. "The crew and ship belong to our employer. They are not my choice."

"Hm, pity. Working with unknown comrades is a dangerous undertaking." Lasse lifted a questioning eyebrow. "What arrangements have been made for getting me into place as cook?"

"Tat'yana and Hans Johansson will be visiting his brother in Wismar before going to Stockholm. You are the brother. You are a baker's apprentice who wants to run off from a bad master. When the cook goes missing, Hans Johansson will pay the captain of the ship to hire his brother."

"I don't like the idea of pretending to be somebody's wife," Tat'yana interrupted. "I can protect myself, but sticking a knife in our client might mean that we won't get paid."

"I'm not that concerned with payment, Tat'yana. What is more important is that the Doppel brothers feel my justice. Hans Johansson is a clerk and not brave. If he gives you problems, you nick him a little." Viktor smiled. "He is a man who would be hen-pecked if married."

"Well," said Tat'yana with a broad grin, "I can do that. Come, Cookie, my bags are packed and the tide waits for no man."

The Hairy Bird, Wismar

"The cook on the *Martha of Wismar* likes big-assed, blowsy barmaids," said Lasse as he closed the door to the private parlor behind him.

"Damn. That doesn't describe either you or me." Tat'yana rose from the window-seat, and walked to the solid oak table, choosing the chair as far as possible from the eating Hans Johansson. "On the other hand," she continued with a nasty smile, "Hansi here is a bit pudgy. Don't you think he would make a lovely barmaid with a wig, a padded corset and a dress?"

Hans looked alarmed and nearly choked trying to swallow and protest at the same time. "How . . . How dare you? I will not accept such insults from a sodomite and a whore!"

Lasse took out his knife and started cleaning the dough he had used in his disguise as a baker's apprentice from his finger nails. Tat'yana just looked at Hans until he started fidgeting.

"But, Hansi," said Lasse, keeping his voice especially sweet and mild, "we really need to get that cook separated from his friends, and the only other way would be to hire somebody with the right looks. Surely you would rather do a little play-acting, than have to pay a real barmaid for the job."

"Such creatures are cheap."

"Yes, but their silence is not." Lasse noted that Tat'yana relaxed when she realized what he was doing. Or rather, part of what he was doing. Lasse didn't share Viktor's confidence that Hans Johansson was just another harmless clerk. Of course, the knife hidden inside the man's doublet, which Lasse had seen

when they shared a room last night, could just be a sensible safety precaution, but it had been a stiletto. And of course the man's preference for very bland food could just be a sign of stomach troubles, but it was the same food Lasse ate himself, since it was difficult to hide any kind of poison in such food. Lasse also didn't like the fact that Viktor wasn't in control of all the aspects of the job, but had to depend on an unknown crew of men supplied by Hans, so this mild attempt at extortion might reveal more about what they were dealing with.

"Ah, I suppose such money might be well spent." Hans visibly tried to gather his dignity and looked down his prominent nose as he handed Lasse ten silver thalers. "After all it is important that I—and my supposed wife—stay in our roles. People will be watching us." He directed a patronizing smile towards Tat'yana. "Which reminds me, the way you were giving orders—even to me—when we arrived was quite unacceptable from a respectable woman. A respectable woman is meek and obedient toward her lord and master."

"Well, you better learn to accept it, Hansi, 'cause you would surely be dumb enough to marry a shrew." Tat'yana narrowed her eyes and continued. "And if you had any ideas about matrimonial rights, you can just forget them. If you try anything I'll cut off your balls and feed them to you. Viktor might have accepted the job, but he knows who you're working for and could just deliver the weapons to your master himself if you should suddenly come down with a bad case of death. You need us to get your weapons, we don't need you."

"How dare you! You're nothing but a thug's doxy . . ."

"I'm Viktor's secretary, you moron, and he . . ."

When the conversation deteriorated into a shouting match Lasse slipped quietly out the door. Tat'yana was obviously quite able to handle Hans Johansson on her own. The business with the thalers had shown that the man was open to extortion, and inclined to pay his way out of anything unpleasant. So, not a professional—or at least not a very good one.

* * *

The torches outside the tavern were smoking in the damp wind when the barmaid led the cook from the *Martha* out the door. For three thalers she had agreed to take her customer into the alley beside the tavern, rather than upstairs to her room, so that the pretty, young baker's apprentice could get his revenge for the unspecified harm the cook had done him. She probably intended to get a bit extra afterwards by threatening to tell the baker Lasse had named as his master, but that wasn't going to be a problem.

As the entwined couple passed the shadow where he was hiding, Lasse stepped out, put one hand over the man's mouth to silence him and swiftly slit his throat.

"Hey, you gone done kill him! That wasn't it." The barmaid let go and backed away.

"Wait!" Lasse reached into his purse and held out the rest of Hans's coins, carefully polished to make them shiny. "Here. I'll pay you more."

"But they saw me leave with him." She stopped and looked at the coins shining brightly even in the dank alley. "Okay. Give them to me." With her mouth twisted into a smile, she grabbed the coins and tried to run, only to have Lasse grab her and slit her throat as well.

Lasse waited a few moments to be sure they were both dead. Viktor wouldn't like that he had killed the woman, but it had been too dangerous to let her live. The town guard might not care about another dead sailor, but the *Martha* was based here in Wismar, and the Doppel family might demand inquiries when one of their employees was found murdered. Lasse squatted down to clean his knife on the woman's skirt before gathering the money and checking the bodies for any valuables. Viktor would probably insist that Lasse gave the loot to charity, but leaving it would tell even a half-wit that something more than an ordinary robbery had been going on, and there was no way Lasse would risk going to jail again.

* * *

"Did you have a good fight?" asked Lasse slipping silently into the parlor where Tat'yana waited.

"Only middling. But what's more important is the fat creep claims to have left a letter with a lawyer telling all that he knows of our plans, with orders to mail it to the Doppel family if he doesn't return for it within a month." Tat'yana spoke barely above a whisper and sat very still, though Lasse could see she longed to pace the floor.

Lasse sat calmly beside the agitated Tat'yana. "Do you think it's true or just a belated attempt to ensure his safety?"

"I don't know." Tat'yana shrugged. "But Viktor is going to be absolutely furious."

"Oh, I'm fairly furious myself." Lasse looked toward the bedroom, where he could hear Hans snoring, but then shook his head. "We can't contact Viktor before he leaves for Christiansø, so we'd better continue as planned, and deal with Hansi later. See you in the morning."

On board the Martha of Wismar just east of the Ertholmene Islands

Hans watched Lasse carry the bread-covered mug of poisoned soup to the captain at the helm. Having that skinny little bitch Tat'yana refuse to show him any respect at all, and even threaten to harm him, was bad enough, but the knowledge that Lasse the sodomite was the more accomplished poisoner really grated on his pride. Hans had removed a few people over the years for the duke of Courland, but since his poisons never seemed to work very well he had often had to resort to the far more messy and dangerous method of a knife in the back to actually kill them.



He really should have insisted on knowing the details of the plan before leaving for Wismar, but Viktor had insisted that he didn't need to know, and Hans hadn't felt like arguing. After learning that Lasse was to poison the crew but only drug the Doppel brothers, Hans had unbent enough to ask what and how much Lasse was going to use, and why the Doppels weren't to be poisoned, only to be told by Tat'yana to mind his own business. Stupid bitch and stupid sodomite, didn't they realize that since Hans held the purse-strings it was he who gave the orders? Well, they'd regret it when Hans *did* write the letter. A pity he hadn't done so already, but who would have thought a thug could be so creative? A smash and grab attack at sea with guns blazing and a quick escape was more in keeping with the stories he had heard about the man. This time, instead of fighting his way aboard, Viktor intended to step aboard unopposed. By sinking the ship with all hands afterwards he also concealed all traces of the crime. The *Martha* would be recorded as just another sorry loss at sea with nobody suspecting foul play or searching for the perpetrators. The thug had planned the perfect act of piracy. After all, nobody wanted to be a pirate in the Baltic. The prizes usually weren't worth the effort.

At least cousin Erland would be on his side. For a moment Hans considered having Erland and his crew dispose of Viktor and his team, but regretfully decided against it. Cousin Erland might not be above a bit of piracy if the risks were sufficiently low and the prize sufficiently large, but taking on Viktor and his bodyguards would simply be too dangerous.

Lasse had come up again to empty a couple of slop-buckets over the side and Hans was watching the diving seagulls when the captain cried out. The man let go of the helm, took a few steps, and fell flat on the deck. Without a hand to hold it the wheel started spinning. Shit! They were close to those small rocky islands, and who would steer the ship? Had those incompetent morons even thought about that?

Hans ran towards Tat'yana as she came up from the cabin holding a hand mirror. "There's nobody to steer! We'll be smashed against the rocks and killed!"

"Stupid!" She pushed past Hans and signaled with the mirror in direction of the islands. Hans turned in time to see Lasse calmly grab the helm.

How mortifying. For a moment Hans felt the blood rush to his cheeks, only to go faint at the sound of a desperate scream from below.

"Damn it! There's always one who can't hold down his dinner," Tat'yana shouted over her shoulder. "Lasse!"

"Just need to secure the helm, Tat'yana." Lasse tied the helm with a rope and walked toward the wild-eyed sailor who had just stumbled up from the mess, screaming and covered with vomit. Lasse led him to the gunwale, and with one quick movement slit the sailor's throat before tipping him over the side.

Christiansø, the Ertholmene islands, 12.5 miles northeast of Bornholm

Grigori kicked at the ashes of an old fire. "Probably from the Swedes when they based themselves here before trying to invade Bornholm last summer."

"And Viktor was most displeased at the Swedes for doing so. He'd been planning on selling the Bornholmers muskets so they could rise against their overlord. Instead the Swedes made a mess of their invasion and left a couple of thousand good muskets in the hands of the Bornholm militia. Bang goes that market," Boris said with a shrug. He was as dour as ever, but he seemed in a fairly talkative mood, so Grigori decided to see if he could get a bit more information about the man who had hired him.

"You and Viktor go back a long way, don't you?"

"Yes, more than ten years. We first met in Brazil when the Dutch West India Company took Bahia from the Portuguese. We were doing very well until Colonel Jan van Dorth died and the Schouten brothers took command. Then everything went to hell in a hand basket. When Bahia capitulated with barely a shot being fired, we were returned to the United Providences in prison ships with only that loot we could conceal within our bodies. Viktor decided that fighting was a mug's game and that the real money was in supplying the military. He asked me to join him as his bodyguard and I've been with him ever since."

"What about the clerk, Tat'yana? She doesn't seem Russian."

"She's not. Viktor discovered her on the back streets of Paris."

"The back streets of Paris? Then how did she learn to read and write?"

"I have my guesses on how she paid for lessons, but don't ask Tat'yana. Her past life in Paris is buried alongside Brigitte."

"Who's Brigitte?"

"That was Tat'yana's old name. If you want to die, just try calling her that."

"Die? But Tat'yana is such an inoffensive little thing."

"True, but Brigitte wasn't. She couldn't be and survive eighteen years on the streets of Paris."

Grigori swallowed and gazed off into the distance. He knew how his widowed mother had been forced to earn money to support him and his younger brothers and sisters before he was old enough to get this job with Viktor. That sort of thing changed a person. He could well imagine Tat'yana's desire to bury her past.

Out to the east he thought he could see something flashing. He pointed. "Boris, is that the signal?"

Boris looked. "It looks like it. Let's warn Viktor in case the lookout has missed it."

"He's over with the captain of the *Dunking Dolphin*," Grigori paused, "Boris, I don't trust Captain Erland and his crew."

"You're wise not to trust them. They are our employer's men, not some of Viktor's. Keep your gun ready at all times."

Grigori passed a hand under his jacket to fondle the butt of his automatic pistol. It was a beautiful weapon, inspired by the automatics from Grantville, and with its custom made brass cartridges and high-capacity magazines it offered considerably more firepower than any revolver. If Boris wanted him to be ready, he would be.

Off the coast of Christiansø

Boris and Grigori boarded the *Martha of Wismar* before Viktor, and while they kept a lookout for possible threats Viktor walked over to Tat'yana. "Where is the clerk?"

"He's in the hold looking for his cargo. Captain Erland and his men have joined him to look for loot. Don't worry; Lasse is keeping an eye on the little creep."

Viktor sniggered at Tat'yana's description. "Did he try it on?"

"Yes, but I soon put him right."

"I'm sure you did, but I'm also surprised you let him live after so grievous an offence."

"I almost didn't, but he claims to have left a letter betraying your part in the theft of the Doppels' new weapon with his lawyer."

Viktor turned to stare at the cargo hatch. "Do you believe him?"

"I don't know. He might have. By the way, what is this weapon system that Hans Johansson's master wants?"

"I don't know. Whatever the cargo is, it isn't as important as getting the Doppels. By the way, what have you done with them?"

"Follow me. Lasse and I left them in their cabin."

Viktor and his bodyguards fell in behind Tat'yana as she guided them toward the Doppel brothers. "What condition are they in? I want them to know what is happening to them."

"They should be awake by now," Tat'yana reassured Viktor.

The sight of both Doppels lying hog-tied on the cabin floor pleased Viktor no end. "Johann and Georg Doppel, so we meet again."

"Who the hell are you, and why are we tied up? Untie us immediately. Do you have any idea who we are?" Johann demanded.

Viktor exchanged smiles with Boris and fell into his game of talking about himself in the third person whenever he wanted to intimidate someone. "They do not recognize Viktor."

"Maybe it's the bad light," Boris suggested taking the cabin lantern and holding it up close to Viktor's face.

Viktor waited hopefully, but neither brother recognized him. "You still don't recognize Viktor? You don't remember stealing from Viktor ten years ago?"

The brothers mutely shook their heads.

Boris held the lantern over them. "Maybe they make such a habit of changing contracts on people that they have forgotten something from so long ago."

"A pity. They will die not knowing why. But if they forget from who they steal, they are not owed that kindness."

"Look, if it's money you want we have plenty. In the strong box by the bed. Take what you want. Take it all, but don't kill us," Georg Doppel begged.

"Grigori, the strong box."

The looks of relief on the brothers' faces amused Viktor. They were such naive fools, worse even than he and Boris had been when they first did business with the Doppels. He used the key he found around Johann's neck to open the strong box. It held a number of heavy bags. He emptied one out on the lower bunk. "Boris, do you remember how much they owe Viktor?"

"Yes." Boris moved over to the bunk and rapidly counted out coins. "There, that covers what they stole."

Viktor scooped up the remaining coins and returned them to their sack before putting it back in the strong box. Then he picked up the strong box. "Tat'yana, see what is happening on deck."

Seconds later Tat'yana returned. "It's all clear. The creep and his followers are still in the hold."

"Very good. Grigori, Boris, if you'd be so good as to help our friends up on deck."

"Now just a minute! We gave you our money," Georg cried as he was carried out of the cabin and dumped on the deck.

"And Viktor is grateful for finally getting the money you owed him. But Viktor doesn't take more than he is owed." He opened the strong box and tossed money bags alternatively to Boris and Grigori until the box was empty. "Viktor is a man of honor. Viktor does not steal from the people he does business with. You value money above honor, so Viktor will let you keep your money." He turned to his men. "Tie the bags to their belts. We don't want them to lose any of their precious money."

The Doppels looked at each other in confusion as Boris and Grigori tied the drawstring purses to their

belts. Georg was the first to realize what was coming. He started to struggle as Grigori picked him up and carried him towards the side.

Grigori paused at the gunwale, the struggling Georg held firmly in his arms, waiting for Viktor's instructions.

Viktor nodded and Grigori threw Georg over the side.

There was a high-pitched scream suddenly extinguished by the splash of Georg hitting the water.

Johann started to struggle in earnest. "No, please, I beg you. Don't kill me."

"Viktor is not going to kill you. He is leaving your life in God's hands. If you reach land Viktor will let you live in peace. Boris."

Johann screamed when he went over the side.

Viktor calmly watched the men struggling to keep their heads above the water. He didn't expect to have long to wait. The water was icy cold and, hog-tied as they were, the brothers would have difficulty staying afloat, while the copper, silver and gold coins tied to their belts would help counteract the buoyancy of their fat bodies.

It was barely five minutes before Georg sank for the last time. That brought out a renewed effort to stay afloat from Johann, but three minutes later he too succumbed to a combination of the cold water and fatigue.

Viktor pushed away from the gunwale and looked around the *Martha of Wismar*. "Where is Hans Johansson? It is time we discovered what this wondrous weapon is."

The four of them walked over to the hatch where Lasse was watching Hans and the crew of the *Dunking Dolphin* struggle to lift a crate from the cargo hold.

With Viktor, Boris and Grigori helping they soon had a number of crates and barrels stacked on the deck.

"What is it?" Viktor asked.

Hans, in the process of supervising the levering open of a crate looked up. "It should be a prototype of a new machine gun, a 'Gatling Gun.'"

When Captain Erland's crew opened the crate Hans dived on it, pulling away the straw packing to expose the multi-barreled machine gun. "Yes. Right, close this crate and check the others. There should be a second 'Gatling Gun' and several thousand rounds of ammunition."

Viktor crouched down and passed an expert eye over the Gatling gun. He'd heard about the up-time weapon and had Tat'yana read out several articles about it. "That looks like it's twelve bore," he observed.

"Yes," Hans agreed. "It fires the same rifled ammunition as the American 'shotguns.' The Doppels claimed it could fire as many as six thousand rounds per minute."

"Nobody can afford to pay for that rate of consumption," the bookkeeper in Tat'yana cried out. "Shotgun slugs were selling at almost four dollars apiece last time I was in Grantville."

* * *

Captain Erland Mansson exchanged looks with his crew. Four Grantville dollars a round—and Hans said there were more than twenty thousand rounds in the barrels—added up to a considerable sum. He looked down at the pile of loot he and his men had collected. It had looked impressive, but that was before he learned how much the weapon system his nephew wanted was worth. Behind him he could hear the murmurings of his crew as they did the arithmetic. His cheapskate cousin was shortchanging him. Erland reached for the butt of one of the wheel-lock pistols in his belt. Drawing it to provide some authority to his complaints, he turned on his cousin. "You didn't tell me how much the cargo would be worth when you hired me."

He detected movement out of the corner of his eye and turned in time to see one of Viktor's men pulling his pistol out from under his jacket. Erland fired before the man could raise his gun, hitting Grigori in the gut and dropping him to the ground.

Erland looked at the fallen man. He'd had no choice but to shoot, but this changed things. He had only wanted to force his cousin to pay a fair price, now he had to think about killing Viktor and his men. Edging on panic he struggled to prioritize. First he needed to gain control of Viktor and his men's guns. Pointing his second wheel-lock towards Viktor he called out, "You and your men, drop your weapons."

He watched the play of emotions between the men. The girl, Hans' doxy, seemed pale and shaken. She was no threat. Best to worry about Viktor and his men.

"Boris, Lasse, drop your weapons."

Lasse dropped a couple of knives while Boris dropped a large pistol just like the fallen man's. Erland looked pointedly at Viktor. "Your weapons."

"Viktor employs dogs and Viktor should bark?"

Erland was confused for a moment by Viktor's way of speaking, but he recognized the attitude. Which left the matter of gaining the guns without getting too close to Viktor and his men. He gestured toward the girl. "You, bring me the guns."

He was surprised when the girl turned to Viktor for permission. He'd thought she belonged to Hans. He took his attention from her to check what Viktor and his men were doing.

* * *

Tat'yana turned her head toward Viktor and silently asked for instructions.

"Do it, Brigitte."

For a moment the past threatened to flood the present. Then the iron gates of her will clamped down on her past life in Paris. Tat'yana knew what Viktor wanted her to do. Could she do it without calling upon Brigitte?

She walked over to the moaning Grigori and reached down for his pistol. She had to peel his fingers off

the butt. Then she walked toward where Boris had dropped his pistol. She didn't know Grigori well enough to know if his pistol was ready to fire, but the slight nod from Boris was enough to let her know his was loaded and ready. She held the heavy steel pistols and walked toward Captain Erland. The man was looking beyond her, completely ignoring her. "Now," a voice in her head screamed. She dropped Grigori's pistol and grabbed the thick butt of Boris' pistol in both hands. Then she rushed the last couple of steps to Captain Erland, pushed the barrel into his gut, and squeezed the trigger as rapidly as she could.

After four shots the voice in her head ordered her to stop shooting and check what the rest of the crew were doing. She looked up to see the pale faces of the *Dunking Dolphin*'s crew staring at the mess that had been their captain. Her body was starting to shake as she aimed the pistol at the closest one. But she didn't have to fire. Boris had arrived. He took the pistol from her hands and dispatched the crew one by one.

Tat'yana slumped down against the foot of the mast, her shaking hands wrapped around her legs. She could see Boris picking up the spent brass cartridges while Viktor held Grigori in his arms. Lasse had retrieved Grigori's gun and was keeping an eye on Hans.

* * *

Viktor held Grigori in his arms, tears running down his face. "Grigori, silly boy, why did you have to go for your gun?"



Grigori struggled to talk. "My family. Who will look after my family?"

"I will care for family." Viktor stared into Grigori's pain filled eyes, then he slipped a fine stiletto from under his sleeve and thrust it deeply just behind Grigori's left ear. Grigori's body slumped in his arms. He lowered the body to the deck and slowly stood. He knew who was to blame for Grigori's death. He turned toward Hans, the stiletto still in his hand. "This is your fault."

Hans blanched.

Tat'yana hurried over to Viktor and placed a restraining hand on his arm. "Remember the letter, Viktor," she whispered.

Viktor paused. He wanted to kill Hans just like his man had killed Grigori, but it seemed he couldn't do it, not as long as that letter existed. He had to settle for wiping the blood from his stiletto on Hans' lace collar. He glared down at Hans before turning and walking away.

Aboard the Dunking Dolphin

Viktor was fuming. He'd finally gotten even with the Doppel brothers for fooling him with the written word only to be screwed over by that ass-kissing little creep Hans Johansson and his letter. He slammed his fist down on the gunwale. "I won't have it. Tat'yana, when we land you will follow Hans. See if he goes to a lawyer. If he does you will visit the lawyer and look for Hans' letter. Bring me that letter. Do anything you have to do. Even call upon Brigitte. But get me that letter."

Viktor knew he was asking a lot of Tat'yana's loyalty to him by suggesting she call on Brigitte if necessary, but he wanted to be sure she understood how important that letter was. He reached out his arms and gave her a comforting hug. "I wouldn't ask this of you if it wasn't important, Tat'yana."

"I understand, Viktor."

Stralsund, two days later

Hans paid Viktor the full amount they had agreed on and got off the *Dunking Dolphin* as quickly as he could. He needed to secure passage to his master and the sooner the better. He was lucky to still be alive. Who'd have thought a man of Viktor's reputation would worry so much about a mere underling? But obviously he did, and he blamed Hans for the young man's death. He fingered the blood stain on his collar where Viktor had cleaned his stiletto. He'd been sure Viktor intended to kill him then and there, but he hadn't. Hans could only assume the girl had told Viktor about the letter he'd claimed to have lodged with a lawyer and that had stayed his hand.

Hans knew that lie wouldn't protect him for long. He had to do something about Viktor before Viktor did something about him. A grim smile brightened his face. A letter. Not a letter left with a lawyer to be forwarded in a month's time. That wouldn't do him much good; he could well be dead by then. No, he needed something much more immediate. Like a letter to the Doppels' family implicating Viktor in Johann and Georg's disappearance . . . one they would receive soon after he left Stralsund.

* * *

Tat'yana paid off the street kids she'd asked to follow Hans. Unfortunately the creep hadn't headed for a lawyer as soon as he'd arranged passage for himself and his cargo. That worried Tat'yana. Could he have really left a letter with his lawyer before going to Wismar? Such a letter could be anywhere.

She edged closer so she could see what Hans was doing. It looked like he was writing. Then he bought one of the new pre-paid postage stamps from the shopkeeper and stuck it onto the letter before handing it to the shopkeeper.

Tat'yana watched the woman toss the letter into a shallow basket on the counter. She had to get that letter, but she also had to keep an eye on Hans. Tat'yana looked around for someone to follow him. Then she smiled. The girl who had followed Hans before was still close by. A few hand signals and Tat'yana was ready.

When Hans left he had two shadows, a pair of girls walking along as if they didn't have a care in the world. With a tail on Hans' movements, Tat'yana could target the post basket. It wasn't very big. She doubted there would be more than a dozen letters a day posted at this dockside store, so Hans' letter should be easy to identify.

Tat'yana approached the counter. Yes, she could see the letter on top, and she recognized Hans' handwriting. She could just buy the letter, but that went against the grain. It would be much cheaper to lift it from the basket while the woman turned her back, and anyway, this shopped stocked some of the best lemon drops in the city. Tat'yana reached under her skirt for her purse and smiled at the shopkeeper. "Two dozen lemon drops, please."

The woman turned and reached for the jar of sweets from the shelf behind the counter and opened it in front of Tat'yana. With Tat'yana paying close attention she counted out the sweets into a paper cone before screwing it tight and exchanging it for the money in Tat'yana's hand. "Haven't seen you for a couple of weeks, Tat'yana."

Tat'yana popped a lemon drop into her mouth. "I've been out of town."

"Well, don't eat your lemon drops all at once. They'll rot your teeth."

Tat'yana smiled and waved as she left. The shopkeeper said something similar every time Tat'yana bought sweets.

Once out of the store Tat'yana examined the letter she'd stolen. She swore when she saw the address. Viktor had to know about this.

The Vulgar Unicorn

"Read it again," Viktor demanded.

For the fourth time Tat'yana read out the letter Hans Johansson had written to the Doppel family. It wasn't that Viktor was hard of hearing, or that she had any trouble reading the letter. Tat'yana was sure Viktor's problem was accepting the magnitude of Hans' betrayal.

"I will kill him."

That, from Viktor, was entirely predictable. "What about the letter he said he left with his lawyer?"

Viktor snorted. "I doubt there is any such letter."

"But can you risk that Hans was telling the truth?" Tat'yana didn't think there was any such letter either, not with Hans having written the letter she'd been reading as soon as he landed in Stralsund, but it was

her job to protect Viktor from the written word.

"I will employ agents to trace Hans and identify his lawyer. There is plenty of time. But Hans will be leaving Stralsund soon. We must act quickly."

"What do you plan to do?" Tat'yana asked.

"I will talk to Lasse and then we will take passage on the same ship as Hans."

Somewhere in the Baltic

Hans awoke with a feeling that there was something wrong. His watch said early morning, and daylight was visible through the dull glass in the small bull's eye, but his head felt heavy and sore. Drinking a full bottle of wine the night before had perhaps been a mistake, but finally leaving Viktor behind in Stralsund had certainly been cause for celebration. That he was also bringing the duke the wanted weapons was good, but getting away from Viktor was better.

Hans reached for the bottle of cold tisane he always drank when traveling—rather than chancing the dubious quality of the ships beer—and took a deep drink. The seagulls. Their cries were filling the air, but that was all. He stopped drinking. There should have been sailors talking, people moving around, but all he could hear was the seagulls, the water, and the groaning of the ship's timbers.

Still in his nightshirt, Hans stumbled out of his cabin. A loud snoring sounded from the only other cabin, the captain's cabin, and after a pro forma knock Hans entered. The captain slept beyond waking. Now in full panic Hans rushed to the deck, and was greeted by the sight of Lasse feeding slop to the seagulls like he had onboard the Martha.

"Good morning, Hans Johansson." Hans swirled to see Viktor leaning against the gunwale behind him with Hans' crates and barrels by his side.

"What . . . What are you doing here?"

"Viktor has unfinished business," the big man growled, and showed Hans the letter in his hand.

"It . . . it's false. I know nothing about this." Hans recognized the letter and backed away, only to swirl again as Lasse came up behind him. "I didn't . . . It . . . It must be the woman. She claimed to be your secretary, but she got angry when I wouldn't screw her." Hans tried to force a smile. "You know how women are. Hell has no fury like a scorned woman, and all that."

Viktor growled again and walked towards Hans. "Nobody cheats Viktor twice." As Hans felt the big man's hands close around his neck he reached for the stiletto he normal carried hidden inside his doublet, only to realize too late that he was unarmed.

* * *

It could only have been minutes, but when Hans recovered consciousness he was tied up and had his feet secured to one of the gun crates. He watched in horror as Viktor and Lasse rolled the barrels of ammunition over the side and then they started to push over the crates.

He was screaming and thrashing about when they started to push his crate over the side. Then he was

flying through the air. The crate slowly settled in the ice cold water as Hans looked up at Viktor for one last time. Silhouetted against the rising sun the bastard was waving goodbye.

* * *

"I still think we should have had Fritz Felix pick up both us and the guns. They were worth a small fortune." As the first sounds of stirring came from below, Lasse let go of the helm, and drank from the sleeping potion bottle before passing it to Viktor.

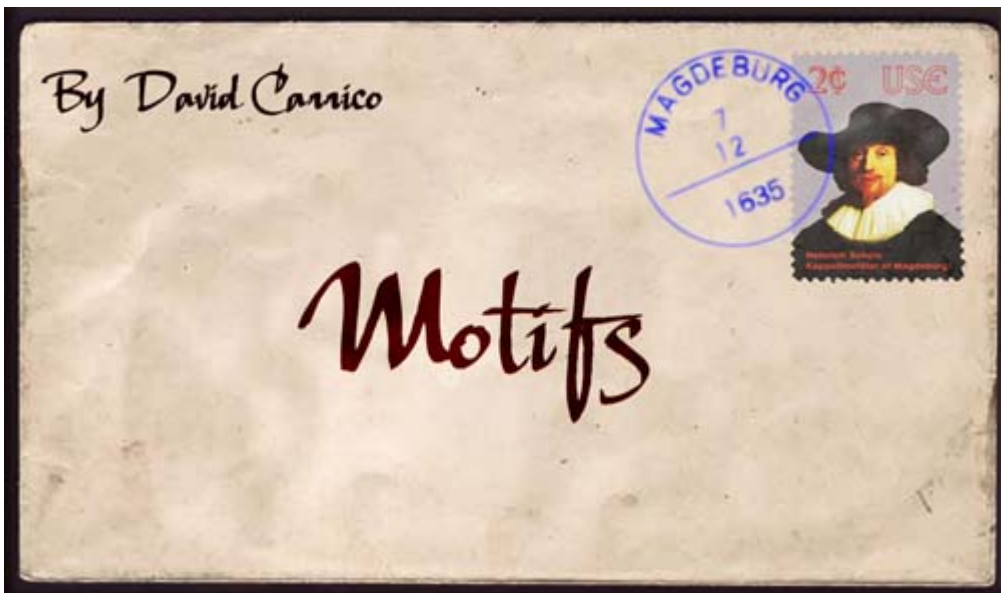
"No." Viktor drank and tossed the bottle over the side before settling down to sleep. "I won't steal a cargo I've been paid to acquire. That would be worse than piracy, and I am not a pirate. And certainly not a pirate in the Baltic."

* * *

SERIALS:

Motifs

Written by David Carrico



To the most revered and accomplished Maestro Girolamo Frescobaldi,

City of Florence

Maestro

It is with the utmost presumption that I write to you. All the world knows of your skill, of your art, of your place as the musical jewel in the setting of Florence and the court of the Grand Duke of Tuscany. Against your demonstrated skill, sir, my efforts do seem feeble indeed. But, nonetheless, I write to you as a fellow musician, presuming upon a recent acquaintance which we have in common, that is, Maestro Giacomo Carissimi.

I, having known of the young maestro's renown for some time, was recently provided the privilege of meeting him in flesh and truth in the midst of the most unusual habitation of Grantville. It was from him that I learned that you had paid a brief visit to Grantville while you were traveling to Magdeburg at the invitation of the royal family of Sweden to perform a selection of your excellent toccatas for harpsichord. It distressed me greatly to learn that you had been so near and I knew it not, for I would have borne any hardship to come to your presence, shake your hand, and discuss with you your very intriguing thoughts and theories upon the proper performance and notation of *tempi* in your published works.

Alas, I was at the time serving at the court of the Crown Prince of Denmark, so you will perceive the difficulty of learning of your presence. I have since left the prince's employ, and such news had not arrived at the court before I left. I am "at loose ends", as the Grantvillers would say. A curiously brusque and hasty folk they might be, but their epigrams and figures of speech do strike the ear in a notable way that is most memorable.

Much the poorer for not having had the opportunity to hear you perform your finest works, and for not having had the opportunity to converse directly with you, I find myself writing to you because I most emphatically desire to hear your thoughts, opinions and theories concerning the music that has been found in Grantville. I am intrigued and disturbed at the same time, and truly wish to hear your perceptions and learn from your wisdom. If you could find the kindness to respond to my poor missive, I will be among the most grateful of men.

With the greatest of respect,

I am your most humble servant and admirer.

Heinrich Schütz

11 day of April, 1634

Grantville

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Dearest Mother



Enclosed find a small sum that I have been able to save for the provision of young Anna Justina and Euphrosine, along with scarves for them and yourself.

The provenance of the scarves is Grantville, so judge for yourself whether they can be worn or must be preserved. I found the bright colors and smooth finish to be most attractive. They are made of something called nylon. I have yet to determine exactly what beast or plant nylon is derived from, but it almost rivals silk in its lightness. I have been in Grantville for several days now, and it is a remarkable place, yet not so remarkable as the rumors perhaps would have it be. I have, however, discovered some most amazing music here.

I assume you received my letter where I informed you of my decision to leave the employ of Elector John George. I would not speak ill of my former employer, but it is a well known fact that his love of splendor is exceeded only by his tight grasp on those few coins that should have been paid to those who support him.

I was for some time after that in the employ of the Crown Prince of Denmark. I have left that position as well, and at the moment am not provided for anywhere, except for a small stipend provided by something called the Royal and Imperial Arts Council in Magdeburg, where I shall be going soon. I have hopes of finding some type of position with the royal family of Sweden, perhaps through the offices of this Imperial Arts Council. King Gustav does have a better reputation for paying those who serve him.

I will remain in Grantville for some little time yet before I go to Magdeburg, so you can write to me here if you will do so soon; else send your missive to Magdeburg.

Tell Anna Justina and Euphrosine that their father loves them, and that I hope to come to visit soon.

Your dutiful son.

Heinrich

12 day of April, 1634, Gregorian style

Grantville

* * *

To the most revered and accomplished Maestro Girolamo Frescobaldi,

City of Florence

Maestro

I thank you for your swift response to my previous letter. By some serendipity or grace of God, it was received in less than three weeks after you wrote it.

I am flattered by your taking the time to write to me with your own hand. Yes, I am the same Schütz who studied with both Maestros Gabrieli and Monteverdi, so it seems that we have more acquaintances in common than Maestro Carissimi.

During the time between the sending of my first letter and my receiving of your letter yesterday, I confess to suffering a spiritual crisis caused by hearing music supposedly written by me in 1647. I spent several days in a most crazed state of mind, and was brought back to my wits only by conversation with a most learned and compassionate pastor, Johann Rothmaler.

As a result of my experiences, however, I am more convinced than ever that the music of Grantville must be studied and made known. Whether Grantville did indeed come from the future, as the inhabitants claim, or whether it is a whole new creation of God, I care not. Let others debate the theology and philosophy, the sciences and mechanics, the language and the behavior. We should learn their music, which is like nothing I have ever seen or heard.

Again I request your wisdom and knowledge be shared with me, that I may properly judge what I hear. I leave soon for Magdeburg. If you find it within your grace to write to me again, send it thence.

With great respect,

Your most humble servant and admirer.

Heinrich Schütz

26 day of May, 1634

Grantville

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Mother

This is a short note to tell you quickly what is happening. Since my previous letter, I have been ill, but am better now. Young Lucas Amsel, whom I am sure you recall from my last visit, has been tending me as well as ever you would wish.

I did receive your last letter, as I have not left Grantville yet. I am pleased that you and the girls like your gifts. Take care that you do not tend them with a hot iron; I have learned that great heat can ruin the nylon, which I have still not learned where it comes from. Too many other things on my mind, I am afraid.

I have not forgotten the ladies in my life. Enclosed are two garments for the girls, of the style called 't-shirts' by the Grantvillers. I confess that I do not know the meaning of the English phrase "Drama Queen" which is in some strange manner embossed upon the shirts, but these were much to be preferred than the ones upon which I saw a creature called "Pok-E-Mon." Although the Grantville children laugh about it, I fear that the pastors of Weissenfels would not so readily accept something that appeared so demonic.

Enclosed for you is a simple brooch. I am assured that the metal is a silver alloy, and that the green stones in the circle are glass, so there is not a great deal of value to it. You are safe to wear it as you choose. Knowing your delight in things that are green, I could not pass it up when I saw it. Remind me to tell you some time of the Grantville custom of 'garage sales.'

I will be traveling to Magdeburg on the morrow. When next you write to me, address the letter there, if you will.

With much love,

Your dutiful son.

Heinrich

27 day of May, 1634, Gregorian style

Grantville

* * *

To Frau Amber Higham

In Grantville

Frau Amber

Behold, I am so bold to write to you without first ascertaining as to whether such correspondence would be welcome to you. I much presume upon your grace, which you have shared with me many times in the last weeks of my stay in Grantville. Thank you for your kindness. I also thank you for the basket of food you provided for our trip to Magdeburg. The ham sandwiches and the deviled eggs—which should be called angelic, instead—lasted through two days of the trip, after which we were forced to rely on local food acquired from taverns and farms along the way. Before the very throne of God I would testify that your food was superior!

Signor Andrea Abati proved to be a most engaging traveling companion, other than he arises in entirely too cheerful a frame of mind each morning. I, on the other hand, with the wisdom gathered along with my gray hairs (all twenty of them), know that mornings are a time when strength must be conserved, in order to be at one's best later in the day—particularly if one has had one too many cups of wine the night before. Such wisdom made no impression upon the good signor, however. His store of jokes and scurrilous Latin songs is seemingly inexhaustible. The popish influence, no doubt. But by the end of the trip, all he had to do was say "Did you hear the one about the cardinal . . ." and Lucas and I would start chuckling. Even Blume the horse would swivel his ears around when Signor Andrea spoke. The man's voice is seductively attractive, I will admit.

Lucas and I have found a place here in Magdeburg, and we are keeping busy by attending the various rehearsals in which my musicians are involved. I still think of them as mine, although most of them now seem to have accepted young Franz Sylwester as their leader. That young man impresses me. His

fervency and dedication to his art is undeniable, and his ability to draw others in his train cannot be denied. Fifty or more string players from all over the Germanies, and he has all but welded them into a single being. I have not seen the like in all of my experience. Though I am almost twice his age, with perhaps my best years behind me, I admit to some form of jealousy to see my own players look to him with such dedication. It is unworthy of me, I know, but then I never admitted to being a saint.

And now, lest I squander the courage I have spent the last several days mustering, I must be even more shamelessly bold and tell you that I greatly desire your presence and company for the day of the first symphony concert. That will be the third of July by the new calendar, the so-called Gregorian. I will pay your way and find respectable lodging for you, of course. If you are unable to attend, I will understand, but I would be among the happiest of men if you would grace my life with your presence for those few days.

With the greatest of respect and sincerity,

Your most humble servant.

Heinrich Schütz

7 day of June, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Honored Mother

Your most recent letter has found me in Magdeburg. Thank you for your news of the health of Anna Justina and Euphrosine. As I have told you many times, your ability and willingness to take them to your bosom and rear them in my Magdalena's place has been a gift as from God. The court at Dresden is no place for young girls to be left without a mother, and the court in Denmark is even worse. Knowing that they are safe in your arms has enabled me to sleep at night with some degree of peace. I am sorry that I have been unable to consistently provide more for their support. I still have hopes that the Emperor, Gustav Adolf, will find some position for me. The fact that I was once the *Kappellmeister* for the Elector of Saxony may carry some weight. It is said that the emperor derives great satisfaction in taking away

everything that once belonged to the elector.

I am sorry that my warning about the hot iron did not reach you in time. Perhaps you can salvage part of your scarf as a small kerchief, or such like. I will try to find another, but since I am now in Magdeburg, it may not be possible for me to replace it.

The music that I have seen in Grantville still continues to astonish me. Preparations are under way to have a grand performance here in Magdeburg of many wonderful works from the future. And yes, I have finally accepted that they are from the future—or perhaps *a* future. In any event, over fifty strings will be participating in a grand performance. That is more players than I was ever been able to bring together, given the elector's parsimony. I so look forward to hearing this event.

Tell Anna Justina that I said she cannot wear the t-shirt to church or to school. It is only to be worn at home, or under other clothing if she goes out. And if she acts in a contrary manner, remind her that what I have given, I can also take away.

I still have hopes of coming to visit, but I cannot tell you when. Please take care of yourself.

With all respect,

Your loving son.

Heinrich

22 day of June, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

Frau Amber

Your missive has arrived, containing your acceptance of my invitation. I was so certain that you would be unwilling or unable to come that I made Lucas open it and read it for me. When he announced that you were indeed planning to come, I grabbed the letter out of his hands to see for myself that he had

made no mistake. You have made an old fool glad.

No, you have chastised me that I cannot call myself old. And by the standards of Grantville, I am not, it is true. Yet I have felt old for so long, for the eternity that has been the nine years since the death of Magdalena, mother of my daughters. There has been so little joy or happiness to interrupt the tedium of my life that I have felt as if I were some ancient covered in the dust of the grave who simply had not had the sense to lie down in the tomb.

When I fell ill, with my mind all crazed and wit-loose, one of the reasons I did so was that I read the *vita brevis* of my life in the great encyclopedia, which indicated that in your world that was I had lived almost another forty years. The thought of spending that much more time in the darkness of the past nine years was almost more than I could stand. I thank God for the wisdom of Pastor Rothmaler, who drew me from the maze in which I was lost.

But although the good pastor drew me from the maze, it was your visits, more than any, which encouraged me and gave me light. I will boldly say it now, that although I would never be foolish enough to compare one woman to another, in this one thing you and my poor Magdalena are alike: that you can by the grace of your own life lift up those who stumble and fall under the burden that life sometimes becomes.

I will send this letter by way of one who will ride the train for the army, in the hopes that you will receive it in but a few days. You have said that you will arrive in Magdeburg on the first day of July. Unless you somehow advise me differently, I will look for you then.

With the greatest of boldness I am

Your most affectionate servant.

Heinrich Schütz

23 day of June, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Dearest Mother

Your letter has arrived, but before I can answer it I must tell you the most wonderful news. Four days ago, after the grand concert I told you about in my last letter, Princess Kristina, daughter and sole heir of the Emperor Gustav Adolf, King of Sweden, told me that her father desired me to become the *Kappellmeister* of the court in Magdeburg. It was such a great shock, after months of hoping, that I stuttered and told them that I would think about it. Fortunately, my thoughts required only a few moments, and I quickly returned to her and accepted the royal offer with great thanks.

My young friend, Maestro Giacomo Carissimi, has at the same time been named to become the head master of the newly established Royal Academy of Music, to be founded and built here in Magdeburg. It is to be a school of music based on the model of what the Grantvillers call a conservatory. I do not envy him the challenge.

My responsibilities are to provide music for the royal court when it is present; to support the symphony orchestra, the grand assemblage of strings that I mentioned in my last letter; to assist Maestro Giacomo if he desires my presence or help; and to otherwise do what I can to spread the knowledge of up-time music, the music brought back from the future in Grantville. That alone is a challenge that will require the rest of my life.

I have already received the first portion of my stipend, and enclosed is a portion of it for the support of the girls. If they are growing as quickly as you say, then I am certain that they need new shoes, at the very least, if not new clothing of all types. Let me know what other needs exist, for I am now in a position to provide more than I have in the past. The emperor was most generous in the amount of the stipend, as well as providing quarters in the palace for the near future. Lucas and I are very well provided for.

Tell Euphrosine that Blume now has a stall of his own in the royal stables, and is very well cared for indeed. He has become a favorite of the stable boys, and will without a doubt become spoiled, fat and lazy if Lucas does not arrange for constant exercise.

I know that you grieved over the death of Magdalena, Mother, almost as much as I did. And I also know that you have tried to tell me again and again that such things happen; it should not be the end of the world or of my life. For long I did not understand what you said; indeed, I grew angry at times that you had said it. Be glad to know, then, that I have at long last emerged from the valley of the shadow of death. I embrace life now, rather than endure it. I will write more on that later.

With all love,

Your son.

Heinrich

7 day of July, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

My dear Amber

It is with relief that I welcome the news that you have arrived in Grantville safely and in good health. My sleep has been disrupted with visions of your rail carriage being involved in some catastrophe—fifteen miles an hour is a totally insane speed of travel. Now that you have completed your journey, my heart and mind can be at rest.

I thank you with all my heart for coming to Magdeburg. The three days I spent in your company have been some of the happiest of my life; or at least of my recent life. The joy of my new position in life was made even greater because you were present to hear the announcement and share it with me.

You observed the reluctance I had for your leaving. Well I know that you have responsibilities in Grantville that you must fulfill, so I did not try to hold you, or at least not greatly. It did surprise me, however, just how much of a void I have felt in my life the last few days.

I have therefore attempted to throw myself at my new work. My duties are still somewhat undefined, but I do know that I will be responsible for music for the court when it is in session, as well as promoting the up-time musical knowledge to be found in Grantville. To that end, I am already dwelling upon which means or several means to use to do so. I may need recommendations from you or Master Weller if I determine there is a need to contact a Grantville attorney.

Behold how selfish I am, that no sooner have you left Magdeburg than I am already asking you to return when you can. There must doubtless be some time ere long at which you can spare some days to travel here and shine some light in the lives of myself and Lucas. Not forgetting Blume, who misses the way you scratched around his ears. Every time Lucas goes to check on him, he reports that Blume seems most disappointed you did not come with him.

With greatest affection, I am

Your obedient servant.

Heinrich Schütz

9 day of July, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Mother

The news provided in your most recent letter both distresses and angers me. That Anna Justina has become such a trial so quickly is out of reason, and her demands of you are intolerable. She has obviously come under someone's influence, and it would be well for us if you can determine who it is.

You have my authority, of course, to apply the rod if you deem it necessary. She is but thirteen, and is not beyond the age where her bottom cannot be warmed enough to prevent her sitting comfortably for a day, or even two.

You may tell her from me that we are not a family of the *Hoch-Adel*, that silver groschen do not drip from my fingertips, and that she will not get an ermine hand warmer, a hat with a peacock feather, thread of gold ribbons, or any other such nonsense. She will be dressed soberly and sensibly as long as she lives under my provision.

It sorrows me that you must deal with this. I leave it to your judgment as to whether I should come to Weissenfels to address her.

With love,

Your son.

Heinrich

12 day of July, 1634

Magdeburg

* * *

To the most renowned Maestro Girolamo Frescobaldi,

City of Florence

Maestro

Just as the vagaries of chance allowed your previous missive to find me in three weeks, your most recent letter has just arrived, some two months after you signed it. I look forward to the spreading of the postal services that I am hearing about, where letters will travel at such speed as to arrive at their destinations within two weeks of their being written.

Maestro, your letter concerns me. I had hoped to receive a balanced judgment of the music available in the libraries of Grantville, music from a time far advanced over ours. Your musical knowledge is regarded so highly, that I felt you would be one of the best sources of such a judgment. It sorrows me that you feel you were treated shabbily at the hands of the Americans. I have met most of the people you mention, I have come to know and admire them, and I tell you that it was not their intent to denigrate you in any manner. Although I have been unable to meet with Frau Mary Simpson, the patroness who brought you to Magdeburg for that concert last December, I am assured that she has only the highest respect for you.

In particular, maestro, Frau Marla Linder—who is now married to young Franz Sylwester, the violinist who accompanied her in one of her songs—is much more than you describe. Your depiction of her as one who would tear you down in order to build herself up is, I am afraid, based more on your anger than on the events of that evening. I find her to be a young woman of grace beyond her years, who would in no way have ever desired to harm you or your reputation. Indeed, she respects you greatly, both for your work and for the ways in which your work helped shape the future of music as the Grantvillers know the art.

As to your charge that there should be no place for her or her kind, allow me to say that even in the Germanies we have heard of Francesca Caccini, *La Cecchina*, who is the songbird in the court of the Medicis. Young Marla bids fair to be another such as the renowned Signora Caccini. Even now her repute is growing.

I beg you to set aside your antipathy with the people, maestro, and consider the music. What is your judgment of the music of Grantville?

With great respect,

Your most humble servant.

Heinrich Schütz

2 day of August, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Dear Mother

It is good to hear that Anna Justina has ceased to be so contentious. On the other hand, it provides no surprise that you were forced to use the rod. She is my daughter, after all, and I do seem to recall some occasions in my early years where my own stubbornness—yes, I admit to it—caused painful corrections to be applied to my own posterior. We should thank God, by all means, that Euphrosine the Younger seems to have inherited the mild temperament of our good Magdalena. It is to be hoped that she will be a calming influence on the family and on her older sister in particular. If not, recalling my own youth, I foresee stormy times ahead.

Enclosed are a few silver pfennigs to be used to provide for the girls. Tell them that their father loves them. I still hope to come to Weissenfels soon.

With love,

Your son.

Heinrich

4 day of August, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

Dearest Amber

Behold me, acting like the veriest lovesick swain. I wait each day for the arrival of a letter, and if none appears, I mope and pout. Pens are broken, pages are crumpled and tossed aside, furniture is kicked. Indeed, I leave a very trail of destruction in my wake. Young Lucas bears the brunt of my ill humors, and will no doubt testify to my behavior.

But today, today your letter appeared. It is as if the sun has broken through the clouds, illuminating what had been shadowed.

Dearheart. To read that written in your own hand sends a wave of feeling through me. You have remonstrated with me before that I am neither old nor a fool, but I know not what else to call myself, feeling as I did when as a youth I first stole a kiss from the daughter of my father's friend. I am giddy, and people make jokes of old men acting as they did when they were but youths. But at the advanced age of 49, I have decided I no longer care what people think. You are my dearheart, my own, and that is sufficient. God is good, to bring we two together, and I daily provide Him thanks for that grace. And grace it most certainly is, for I have certainly done nothing to merit it.

Please provide my thanks to Master Weller. The documents concerning the foundation of the Grantville Music Trust have arrived, and for the most part have proven to be both reasonable and satisfactory. Those of us here in Magdeburg have but a few observations and recommendations to make concerning emendations. Without a doubt, they will be on their way to Master Weller before too many more days have passed.

Frau Marla says to say Hi to you from her. Her observation of the proposed work of the Grantville Music Trust is that the work should ordinarily be ordered by the medium in use. The tapes should be notated first, then the LPs, whatever they are. She is concerned about deterioration, if I understand her correctly. Only after those are done should someone begin working the CDs—which I have heard, and are indeed a marvel. I hope that the knowledge and skills to make those have been preserved. It would be a grievous loss indeed if they cannot be carried forward. Please convey these thoughts to Master Weller and the others involved in Grantville.

Also, please make my thanks known to young Thomas Schwarzberg for the work he has been doing. I trust that he has been training others to also notate the music from the recordings. The trust will need more than one person to do this work. It is not that young Schwarzberg is less than adequate; indeed, he has proven to be a most worthy amanuensis for the future. But I find that I want to hear music from his pen and heart, inspired by his muse; music that only he with his experiences of the last year or more can write. Give him that charge from me, if you will.

I still hunger to see your face again, and hope that you can find some way to come to Magdeburg again

soon, even if it is only for a day or two. A small bit of bread can keep a man alive for a long time, and so I find in glimpses of you the very life that I need.

With devotion, I am

Your humble servant.

Heinrich

7 day of August, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

My Dear Amber

Once again I am lifted to the heights upon receiving your most recent letter. I think that it would not even matter what you wrote; that you could copy verses from the Bible or passages from the great encyclopedia, for the mere sight of your hand on the page fills my heart with joy.

It is good to hear that things continue to be well with you. We are well here, of course. The musicians have for the most part embarked upon a performance of the great oratorio, Messiah, by one Georg Friederich Händel. Frau Marla has commissioned the printing of the music by a local printer.

Printers tend to either be arrogant or seditious. This family has managed to be both. The father, one Agamemnon Zopff, takes bombast to its utmost, perhaps to match that of Falstaff in your beloved Shakespeare. The younger son, Telemachus, I hear has ties to the Committees of Correspondence. It is fortunate that the older son, Patroclus, seems to be a man of good sense.

I cannot tell you the joy that is mine to hear that you will be able to come to Magdeburg in October, even if it is but for a few days to consult with Frau Haygood about the new school. Not all your time will be consumed with that responsibility, and I trust that there will be time for the two of us.

Until then, my dearheart.

Your devoted servant.

Heinrich

2 day of September, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Honored Mother

I have such good news to share with you and Anna Justina and Euphrosine. I am to be married! I am at this moment delirious with joy, but I must calm myself and attempt to answer the questions I know you all will have.

Her name is Frau Amber Higham. Her surname is pronounced hei-am. She is, as you may have already assumed from her very name, a Grantviller, one from the future. How do I describe her to you? I will attempt it, but it will no doubt be a poor reflection of the reality.

She is tall, as most Grantvillers are, not slender, but neither is she corpulent. Her hair is a brown color, not as short as many Grantville women wear theirs, but not as long as yours is, either. She wears hers trimmed to her shoulders and brushed back from her face. There are wings of silver in her hair at the temples.

I never before realized how difficult it is to describe someone else so that you can see them. I persevere.

Her mouth is wide, her eyes are brown, and she has the most engaging laughter, which sounds often. Indeed, her sense of humor is lively.

As with many of the Grantvillers, she is a well-educated woman, at a level that would equal a university degree in our time. She has been teaching, but her muse is the theatre.

She is a mature woman—indeed, some years older than myself—and a most gracious woman as well,

yet one who is also filled with the wisdom of having lived over fifty years. You need not worry as to her ability to withstand my stubbornness. She is capable of making even me see reason.

We will be married in December here in Magdeburg. I would that you and the girls come to be a part of it, and to stay during the holidays. Afterward, Frau Amber and I are in agreement that Anna Justina and Euphrosine should come to live with us, to make a family. I have been without my daughters for too long. They have grown up without a mother, and with little evidence of a father as well. It is time that they join me, or I should say, us.

Lest you be concerned about the girls, mother, let me assure you that this is as much Frau Amber's desire as it is mine. And they will be well provided for here. There is a school for girls here in Magdeburg, the Duchess Elisabeth Sofie Secondary School for Girls. I will enroll them there, where they will be taught by some of the finest of both the Grantvillers and the Magdeburg teachers, among whom is Frau Marla Linder, who, although she is a woman, is also one of the very finest singers I have ever known.

We do not want to take the girls away from you, mother. Come with them, stay with us. We will provide you with your own rooms, where you can rest as you desire, yet still be involved with Anna Justina and Euphrosine.

It would gladden my heart if you will come.

With all love and respect,

Your humble son.

Heinrich

8 day of October, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

Dearheart

To know that you are once more safe in Grantville gives me the greatest of reliefs. I thought that my sleep had been broken the previous time you traveled. It was nothing compared to what I felt this time, night after night, until your letter came.

I wake up each morning afeared that it was all a dream, that your agreeing to marry me was but the delusion of a fevered mind. For that reason I keep your letters by my bed, and each morning read them anew until I reach your most recent page, wherein you talk of the wedding plans. My heart is so full, it is as if I were an old wineskin overfilled and about to burst. How can one man's life contain so much joy? How can God have seen his way to bless me so much?

Each day is begrudged its span, that its cycle of light and dark will occupy so much time and thus only slowly draw me nearer to December. Even when my life was in darkest shadow, never did time seem to proceed so slowly.

I know that you must fulfill your commitments in Grantville. I would not want it said that you had broken your agreements. But my rebellious heart is aboil, bubbling, until I sometimes feel that I must shout or scream.

My reputation as a sober, staid man I fear is somewhat tattered. I smile, and whistle, and hum the day long. Frequently I catch Lucas looking at me with the oddest of expressions. The dear boy knows what is happening, but he does perceive that I am not the Schütz he has served for these past years, which does surprise him, and others as well, I must admit.

As we had discussed, the quarters I was allotted in the palace will not suffice for our entire family, so I have undertaken to find others. The palace rooms will remain my work rooms, my studio, where Lucas can reside as well. By the time it is needed, a home will be provided.

Come as soon as you can, my dear.

With all my love.

Heinrich

12 day of October, 1634

Magdeburg

* * *

To Frau Euphrosine Biegerin verw. Schütz

In Weissenfels

Dearest Mother

Yes, plans for the wedding are proceeding apace. We will say the vows on the fifteenth of December, with the banns posted at the appropriate times before then.

Neither of us desires some grand and elaborate event. At our ages, it would be but foolish. So it will be done in one of the chapels of the Dom, with only a few family and friends in attendance; perhaps thirty or forty in all.

Set your protestations aside, Mother. It is the desire of our hearts that you come to us and live with us. Please do not disappoint us. I have found a townhouse to rent for all of us, in which I think you will be most comfortable.

It pleases me that Anna Justina and Euphrosine are excited about coming. Do not let them become so excited that they neglect their studies or their other responsibilities.

I have made arrangements for you to travel with a group of merchants. They expect to be at your door around the fifth day of December. It is only about one hundred miles from Weissenfels to Magdeburg, so that should allow adequate time to travel and still arrive before the wedding.

It is the prayer of my heart that you will come to love my Amber as much as you did my Magdalena. Although she cannot be the same person, Amber is as much in love with life and with me as Magdalena ever was.

I look forward to your arrival.

With all love,

Your son.

Heinrich

5 day of November, 1634

Magdeburg

* * *

To Frau Amber Higham

In Grantville

Dearest

The time fast approaches when you will begin your travels here to Magdeburg, to stand at my side. Lucas despairs of holding my attention for any task, as within moments my thoughts return to you. He says that he will be beyond glad when the wedding is concluded and I will once again be able to focus my thoughts on my responsibilities.



I will not say that I am doing nothing. I have begun sketches for new works: a fantasia, in the manner of Vaughan Williams; a passion, which I will base on the Gospel of St. Luke, I believe; and two or three other works. They are but the merest hint of what is to come, yet I find that in all of them is some thread of you, some essence of your light, that makes me smile, and laugh, and at times almost weep. In the future that will now be, rather than the one from which you came, I believe that scholars will look at the corpus of my work and will place their fingers on December, 1634, with the note that here the inspiration of the man Schütz elevated to another plane. I hope that they will note our wedding's date, and realize that the best of me came from you.

Make what haste you can. I await you with singing heart

With all my love.

Heinrich

1 day of December, 1634

Magdeburg

* * *

Grantville News

Wedding Announcements
Tuesday, December 19, 1634

Higham – Schütz Wedding

Amber Dunn Higham, late of Grantville, was joined in wedlock with Heinrich Schütz, the noted composer, on Friday, December 15, 1634, in Magdeburg. The couple will make their home in Magdeburg, where the groom is employed by the emperor as Kappellmeister of Magdeburg and the bride intends to become active in theatre.

* * *

A T & L TELEGRAPH

BEGIN: GVL TO MBRG

TO: FRAU EUPHROSINE BIEGERIN VERW SCHÜTZ

ADDR: SCHÜTZHÄUS MAGDEBURG

FROM: HEINRICH SCHÜTZ

DATE: 26 DEC 1634

MESSAGE: MOTHER

AM IN HEAVEN BUT MUST COME DOWN TO EARTH

WE WILL BEGIN RETURN TOMORROW, ARRIVE HOME 30 DEC

LOVE TO ALL

HEINRICH AND AMBER

PS: TELL GIRLS BEHAVE OR NO TREATS FROM GVILLE

END

* * *

To Maestro Girolamo Frescobaldi,

City of Rome

Maestro

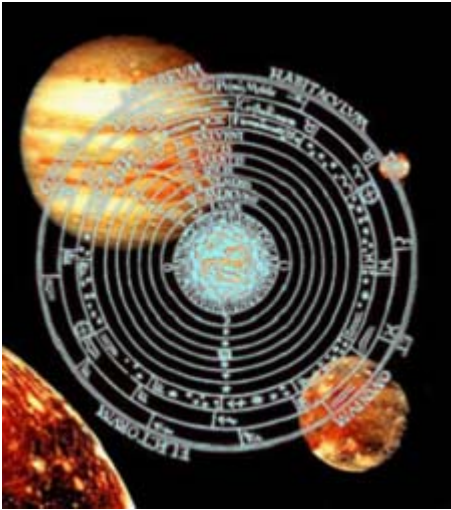
I see from your most recent letter that you have removed yourself from Florence and resumed your post as organist at Saint Peter's in Rome. I trust that the relocation was harmonious and the travels were easy.

I am sorry to appear so delinquent in responding to your letter, but it appears that it spent a great deal of time on the road. You signed the letter on the third of September, yet it was not placed into my hands until the twenty-seventh of November. I have no explanations as to why, of course, only to note that it did.

Unfortunately, I was at that time very occupied by plans for my wedding, which occurred on the fifteenth of December, as well as my involvement in a great musical performance produced for the King of Sweden, Gustavus Adolphus and his daughter, Princess Kristina. With that event having occurred, I can now take the time to respond to your writings in an appropriately respectful manner.

It dismays me, maestro, I must admit, that you so vehemently reject the music to be found in Grantville. I cannot deny your charge that much of the music is dissonant and discordant. Yet note that the world around us is filled with dissonance and discord. It is those qualities that make the moments of consonance and concord to be so prized and appreciated. Certainly, even prior to the appearance of Grantville, my own works had received the occasional accusation of being dissonant. But how else are we, as composers, to create and release tension in our works, to create more than musical pap, if the tools of dissonance and discord are not available to us? Certainly, the giants of the music in Grantville, wherever and whoever they truly were, have much to teach us of this aspect of our art. I think in particular of an Englishman named Ralph Vaughan Williams, whose string music is enough to wring the heart of a statue. God Above knows that he has wrung mine.

I caution you, maestro, to take care of how you express your displeasure with Grantville's music. To accuse it of being the work of the devil treads perilously close to the Manichaeian heresy. The Adversary has no creative ability—all the church fathers agree on that. He can only twist and pervert that which is already created. In this one thing we mortals shine above even the angels; in this one thing some spark of the Divine Godhead still seems to linger in us; that we can create music that upon rare occasion would not be out of place before the very throne of God. I have found such in Grantville.



It grieves me, Maestro Girolamo, that my judgment of Grantville and its music is so at odds with yours. But I can trace your hand, and my hand, and the hands of Gabrieli, Monteverdi, and even your student Pachelbel, throughout that music. It was formed from the tools we made, from the seeds that we planted, from the works that we shaped. We have an opportunity to take from it, to learn from it, to stand on the shoulders of the giants who at once came after us and also before us, to write such music as will harmonize with the music of the spheres and even resound before the throne of Heaven; but only if we do not turn our backs on it.

Maestro Carissimi stands with me. We have entered into correspondence with Monteverdi, Melchior Frank, Johann Crüger, Samuel Scheidt, and others. It is our endeavor to bring the music of Grantville to the world.

This is the future of music. On this I take my stand. God help me, I can do no other.

With respect,

Heinrich Schütz

Kapellmeister of Magdeburg

4 day of January, 1635

Magdeburg

Turn Your Radio On, Episode Three

Written by Wood Hughes



Chapter Seven
December 1633, Grantville,
State of Thuringia,
United States of Europe

It never got easier, Dr. Nichols thought as he welcomed John Chalker and his helper Georg Fleitner into his private office. The best way was just to go ahead and give the patient his diagnosis. "Reverend Chalker, it appears you have early stages of a left ventricular myocardial infarction. It's a form of heart failure."

Nichols let the words soak in for a moment, then continued, "I'll try not to go into lecture mode but give you some basic information and tell you how we need to manage it."

"The heart is a pump. That's it. Left-sided heart failure backs up fluid in the lungs. Some of the classic signs are shortness of breath, fatigue, and coughing bouts. The cough may have pinkish tinged fluid in it. So far, yours doesn't, but that's caused by high blood pressure pushing not only fluid but some red blood cells into the air sacks in the lungs. That's what I learned by listening to your lungs and heart, a distinct set of crackles and a murmur."

"We can expect future symptoms to include pooling of fluids in your lower extremities. Lower legs and ankles will start to swell like balloons. This, along with shortness of breath and weight gain due to water retention can come on slowly over an extended period."

Nichols opened the patient folder. "Now, here's what we can do to make sure you're around for a good long time to come. First of all, low salt is essential. Limit your intake of meat. Keep your feet elevated whenever possible and stay off them as much as possible. The heart has to do a lot less work when you're reclining than when you're standing up."

"But what about my sermons?" Chalker asked.

"Reverend Chalker, I've seen you conduct a service," Nichols replied. "You just have to ask yourself is it more important to conduct the sermon or to minister to your congregation? The fewer sermons you give, especially the way you give them, the longer you'll be able to be the head pastor of your flock."

No, it never got easier. But it helped to know that the choice remained in the hands of the patient.

* * *

"Reverend Fischer! Reverend Fischer!"

Fischer turned to see Phyllis Dobbs hurrying up the trolley aisle toward him. After she sat next to him and caught her breath, she burst out, "It's so wonderful what you and the church are going to do with all that money! When Slater came home last night and told me about it, I remembered this.

Phyllis fumbled through her large canvas grocery bag until she found and pulled out a large, gray paperback book with a black and white photograph of a woman on the front. "I bought this at a high school fund raiser a few years ago. That was back when I was working at the school cafeteria, you know. It's the story of a Pentecostal female preacher who starts her own evangelical ministry. I never did get around to reading it myself. Back up-time I was going to give it to one of my friends in Fairmont who went to the Four Square Church, but I just never did.

"Maybe it might help you." Phyllis thrust the book into Fischer's hands.



The title of his new book was *Sister Aimee: The Life of Aimee Semple McPherson* by Daniel Mark Epstein. There was a quote on the back out of a review that said, "With her radio ministry and her theatrical sermons, Sister Aimee ushered in the modern religious age."

Fischer pulled off one mitten and started to thumb through the book. Some pictures of a tall woman and her children, then of what looked to be a great round sanctuary, finally of the same woman on a crowded stage with a microphone.

A female minister? Fischer decided that this was a book he was going to have to find time to read. "Thank you very much, Sister Dobbs. I'll be sure to read this and return it as soon as possible."

"No need in that, Reverend," Phyllis replied, rejecting his offer with a motion of her free hand. "I feel like I owe you for helping Slater find the Lord and saving his hand. I just don't know what we would have done if it weren't for you. He's like a new man!"

"Trust me, Sister, it wasn't me. It was the Holy Spirit who touched your husband's hand and, evidently,

his heart."

* * *

Fischer came back to the book after his talk with Chalker and a considerable amount of prayerful study. It seemed that at every opportunity, the Protestant faith of the future had rewritten the understanding of the present day Church.

"Dieter," Chalker grinned. "You've got to understand that when Martin Luther nailed that poster to the church door, that was just the start!"

"All Christians are just men and men make mistakes. Look at Peter. In Matthew 26:74:75, it says, 'Then began he to curse and to swear, saying, I know not the man. And immediately the cock crew. And Peter remembered the word of Jesus, which said unto him, Before the cock crow, thou shalt deny me thrice. And he went out, and wept bitterly.'

"Since God's purpose concerning man is to seek and to save that which is lost, to be worshiped by man, and to build a body of believers in the image of His Son, the priority reason-for-being of the Church is to be a channel of God's purpose to build a body of saints being perfected in the image of His Son as laid out in Ephesians 4:11-16 and First Corinthians 12:28 and 14:12."

Chalker paused as he recalled a lesson learned early in his life.

"There's something else you're going to struggle with, Dieter. Sister Aimee's three husbands. But, as you'll see, each one of them was sent to her to help her fulfill God's mission.

"Even in leaving her second husband, she followed God's plan as Jesus said in Luke 12: 51:53, 'Suppose ye that I am come to give peace on earth? I tell you, Nay; but rather division: For from henceforth there shall be five in one house divided, three against two, and two against three. The father shall be divided against the son, and the son against the father; the mother against the daughter, and the daughter against the mother; the mother-in-law against her daughter-in-law, and the daughter-in-law against her mother-in-law.'"

Seeing the troubled look on Fischer's face, Chalker smiled. "There's been a lot smarter men than you and me hash out these issues in the next three hundred plus years. Even the Catholics of our time have allowed more women into their church leadership and have found a work around that allows their church members to annul their marriages a lot easier than in this era.

"Anytime you have a hard time reconciling what you've been taught, remember what Jesus said in Mathew 7:20, 'Wherefore by their fruits, ye shall know them.'

"You think of it that way, and you won't go far wrong."

* * *

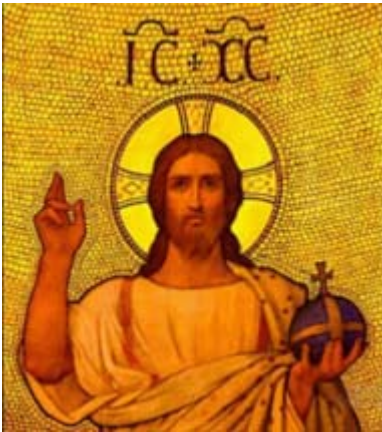
What a book it was! The adventures of this woman of faith from that other future read like an up-time adventure novel.

But it wasn't until she left her second husband that the book started to reveal to Fischer a model for how he could advance the faith in this time. In very long, scientific words that he would have to look up, the book seemed to say that a scientifically creditable reason might lie beneath faith healing. That there may

be a link to the chemicals the body produces when in the throes of hysteria, and physical changes.

Fischer wasn't so sure that he believed that St. John the Baptist should be lumped in with whoever this "Sister Teresa" was or if it was right to question how God decided to accomplish his miracles. Still, however imperfect the explanation, perhaps it could help him recognize the congregants who offer fertile ground to allow God's will to be accomplished in their life.

"Neuropeptides. Synovial membranes. What words are these?" Fischer read out loud. But it was clear that this author believed that even if the miracles had occurred using purely scientific means that made them no less miracles of the spirit. But profound belief still needed the physical touch of the healer to finish the job.



Fischer marked his place and laid the book on his lap. *So the power of faith depends on the collective belief of the members present.* He remembered that in the Bible it said, "Wherever two or more of you are gathered in His name . . ."

The more people believe miracles are going to happen, the more miracles do happen. Thinking back to the atmosphere of the revival that had brought him to the Pentecostal faith, he understood what happened. "I must learn to involve the congregation in a much more emotional way. More like Reverend Chalker would have if he were my age."

When Fischer tried to read on, he could hardly concentrate for all the thoughts that were running through his mind.

* * *

Marc Kronzberg was engaging in his favorite morning pastime—reading the local newspapers at Bridges Books and Coffeehouse. Not that Der Kronz cared two *Pfennigs* about any story that the local newspapers reported on. For that, he certainly could depend on the better and faster coverage of his own beloved radio station.

No. Der Kronz was again reading the advertisements.

"Oh no! They could have bought five more thirty second spots for what they wasted on this half page!" He grimaced. Another sip of the house espresso followed by a scribbled note to record a new concept. It would be ready for his pitch for the next he saw the shop owner who had placed this poorly conceived waste of money. Only then did he turn the page to feast on the delectable agony of more missed advertising dollars. Not to mention their resulting commissions.

"Mr. Kronzburg?"

Marc looked up at the unexpected interruption. "Mrs. Kurger! What a wonderful surprise to see you here this morning. I was just thinking about you.

"See . . ." Marc bolted to his feet and flipped the newspaper back a few pages to point at a half page ad. "Great stuff for the Kurger Emporium!"

"I was just thinking how much better it would work for you if we put a series of thirties on the station to instruct all our listeners to run out and buy a paper to look at it!"

"Yes, I'm sure we can talk about that soon, Mr. Kronzburg," Maria said, cutting Marc off. "Right now, however, I'd like to talk with you about buying an hour."

Maria could practically see the wheels rolling in Marc's eyes. "An *hour* ? Why, that's one hundred and twenty thirty second spots! That's wonderful! How long of a period would you like to space out this spot buy? May I suggest . . ."

"I'm sorry, Mr. Kronzburg." Maria knew that it was Marc's nature to take charge of any conversation and lead it to buying spot ads on VOA. "That's not what I meant. What we'd like is to buy a whole hour on your radio station every Saturday night."

For once, Der Kronz was quiet. Without moving one muscle in his face, he sat back down, reached out with his left hand, found the cup of espresso sitting before him and brought it up to his lips. After gulping it down, he finally replied, "Let me see if I have this straight, Mrs. Kurger. You and Mr. Kurger want to buy a full one hour block of time to advertise Kurger's Emporium on The Voice of America every Saturday night for . . ."

The concept was boggling. Even to Marc's well-crafted sales imagination.

". . . how long?"

"I'm sorry, Mr. Kronzburg," Maria replied. She sat in the chair next to Marc and began again. "Let's start from the beginning."

Chapter Eight

". . . So until next time, this is Brother Fischer of the Grantville Pentecostal Church inviting you to listen to our closing hymn sung by Sister Jennifer Copenhaver and the children's choir of our church. You have a blessed day!"

*"Come and listen in to a radio station
Where the mighty host of heaven sing
Turn your radio on (Turn your radio on)"*

*December 1633, Grantville,
State of Thuringia,
United States of Europe*

John Grover arrived at the station early, but everyone else was in the office waiting on him. "Good morning, everyone! Gosh, and I thought I'd get here in time to have a cup of coffee before our meeting."

After shaking hands and exchanging pleasantries, he looked toward his receptionist, "Helga, could you please get me and anyone else who would like a refill some coffee? And ask Franz to join us in the conference room when he's free, please."

John took his seat at the head of the table. Roy and Jennifer Copenhaver sat to his left and were joined there by Maria Kurger. Brother Fischer took the chair opposite his, while the other representatives of the station management, Deanna Dee and Marc Kronzburg took their seats to his right.

John smiled. "Roy, good to see you and Jennifer. How are things going in Franconia? Hope we didn't have to drag you away from government business."

"No. It turned out that I had to be in Grantville this afternoon for a conference with the Federal Reserve." Shaking his head, Roy added, "We're real shorthanded over there in Fulda. Most of the powers that be still suspect that we're Swedish lapdogs and are leery of anything we propose. Right now this new State of Thuringia is in name only. It's going to take time."

John now turned his attention to Fischer. "I got up early this morning to listen into your devotional, Brother Fischer. I can see why your church is so excited about this proposal. I especially liked the song Jennifer closed with. I remember listening to Ray Stevens sing that, years ago. It was always one of my favorites."

"Thank you, Mr. Grover." Fischer smiled and gestured to Jennifer. "Sister Copenhaver suggested the use of that song before our second devotional. Something that I said my first time on the radio made her think of it. We've had a lot of people come up to us and compliment her version of it."

"Well, that sure goes a long way to explaining all the fan mail we've had to handle for you since you started sitting in for Reverend Chalker."

Jennifer glanced at her husband as Roy broke in. "I guess that brings us to our offer. John. Marc, have you told John what we want to do?"

Marc Kronzburg snapped to attention and began his pitch, "Yes sir, Mr. Copenhaver. I think it's very good . . . for a starting position."

John added, "It definitely is that. That's another reason I wanted to schedule this meeting after Reverend Fischer's appearance this morning. I wanted to be sure that he wasn't soliciting our listeners for commercial gain. I was pleased to hear . . ."

Just then Franz Peck walked into the room. "Franz. You know Reverend Fischer and Jennifer Copenhaver. Have you ever noticed anyone from their group asking for donations or money over the air?"

At this unexpected question, all the church people immediately swung their bodies around to see what Franz was going to say.

"No, Herr Grover. Reverend Fischer has never actually mentioned how to write him at any address. He hasn't even given out the station address either."

"That's great. Thanks for your time." Franz turned and headed back to his basement studio.

Roy swung back to put his full attention on John. He leaned over the table and glared. "Exactly what are you implying, John?"

John leaned back in his chair as he responded, "No offense, Roy. I just wanted to make sure that nothing was going on at my station that the General Electronics board would consider to be a bad business practice. After all, after just three devotionals, we're dealing with more fan mail for Reverend Fischer than any other program on our airwaves. Even the ones that run daily and our most popular weekly shows like *Robin of the Committees of Correspondence* .

"Now that I've been assured that we're working on a level playing field . . ." Grover took a sip of his coffee and picked up the file in front of him. "Let me tell you what my first thoughts are on your proposal.

"First of all, there is no way we can sell you programming rights to an entire hour. We must keep at least five minutes at the top and bottom of every hour for our news staff."

Roy, Maria, and Marc smiled, realizing that this negotiation was going to work. If John was thinking of ways to modify and improve the church offer, he had already agreed to it in principle.

"The second problem I have is that it's an open-ended agreement. We need to add some language that allows both your church and my station to terminate the agreement under specific circumstances. If you don't pay or you harm the other programming we put on the air, we want to retain the right to cut you off."

Roy smiled. "Neither of those terms poses a problem, John. Jennifer here has been working on what kind of program we're planning to put on."

Jennifer piped up, "John, you're going to be very pleased with our program. First of all, we're not planning to be 'preachy' on the show itself or solicit donations directly.

"Our plan is to produce *The Grand Ole Opry meets Star Search* . We'll have a good Christian message, lots of good music and try to bring in whatever musical talent that responds to our talent contest auditions during the week." She paused a moment and decided the fact that the Elders of the church had scheduled the auditions to take place immediately before the regularly scheduled Bible study wasn't important to the issue at hand. "We'll mix that in with a show band and some of the talent from the church performing some up-time country, some gospel music, and some bluegrass. Maybe we can get the Old Folks band to come in for a guest appearance. Or Benny Pierce and Minnie—they're popular already, so we can mix them with the new talent. Of course, Brother Fischer will be the show host and he'll have a segment where he tells the children a morally positive story. If you've listened to the devotional, you know how good he is with children."

After Jennifer finished laying out the proposed show format, they discussed some questions on specific details with Deanna Dee and John. When everyone ran out of questions, John tapped his pencil on the

tablet for a moment and turned to his program manager, "Well, Deanna Dee, what do you think?"

All this time, Deanna Dee had been jotting down notes of the specifics of the church proposal as it applied to her. "I've got to tell you, John, I like it. I used to watch Ed McMahon all the time on *Star Search*. It really pulled in the audience. I even used to watch the repeats of the old *Ted Mack Show* on that cable channel that showed all the really old TV repeats. It was one of the most successful shows of its era as well. I think it might have actually started up on radio. Then it moved to the early TV broadcasts."

"We'll have to add some man hours for station personnel to make the show work technically. I'll probably want to add on an additional janitor on Sunday morning to clean up after everyone's left."

Deanna Dee flipped through her notes, continuing, "The biggest thing we've got to look at is how do we keep the show in the critical hours. I'd suggest we set the schedule so the show starts on the first top or bottom of the hour following dusk. That way as the day gets longer, we don't have to keep moving the show around the fixed newscasts. It will start at 6:00 now, then move to 6:30 and so on as sunset changes."

After another round of questions, the discussion finally got to money.

"Marc," John looked to his sales manager. "How much do you think we should charge for this block of time?"

Finally Der Kronz could do his thing. "Mr. Grover, since we're keeping the two five minute newsbreaks, we could just charge them for fifty minutes at the one minute rate."

Roy responded to that suggestion with a laugh. "That would be nice, Marc. But we've come up with a different concept for fairly valuing the time. Maria, could you explain our thoughts?"

Maria opened the file in front of her and brought out a VOA Rate Card. "I've gone over this and the previous rate cards that Marc furnished us at Kurger's Emporium, and it's clear to me that the time slot we're looking at is set up as a fixed percentage of the cost of weekday spots at the same time. What that tells me is that you don't consider Saturday night a high listenership period."

Marc broke in, "Yes, but this isn't just the set aside commercial time we're talking about here, Mrs. Kurger. You want to promote your business . . . I mean your church the whole hour."

"That's not quite right, Marc," Jennifer interrupted. "We're buying the sponsorship of an hour entertainment program that has commercials built into it!"

"Precisely." Maria nodded and continued. "What we propose is to buy every commercial slot during the show for the length of the contract. We'll also agree to rate increases based on the same percentage that you change the rest of your rate card as you've currently established. What's more, we'll pick up any additional costs Deanna considers necessary to run the show properly."

"But to my mind, the best part of our offer is that you will be able to resell those same spots as special programming for whatever Marc thinks he can get at or above the rate we're guaranteeing. If he sells them all, we'll get credited back our guarantee costs, and you keep the rest."

Marc's eyes glazed momentarily as he calculated the profit to the station. "Yes, but we've got a certain percentage amount of overhead allocated to each commercial spot we sell. I don't know . . ."

At this point, Roy added, "Marc, we'll even guarantee upfront a full month of shows in cash. Any spot you aren't able to sell, we'll use ourselves. You just sell what you can and allow our new church treasurer access to your books so we can verify your numbers."

"I can live with that, Roy." John pulled himself close to the table and picked up his pencil to write the terms agreed so far on his copy of the proposal.

Roy thought for a moment and then asked, "John, we're getting a lot of different currencies in the collection plate as well. Since the station doesn't have to pay an exchange fee, would it be alright for us to pay in those other currencies?"

"I don't see any problem with that," John replied. "We get the official exchange rate at the time we make our deposits. I'll pass that right back to the church. Then, once a month we'll settle up the difference in USE dollars."

As John began writing, Marc once again turned his eyes upward and seemed to lose focus as he thought through the deal. *There is something I'm missing. Why are they so willing to commit this amount of money and agree not to solicit donations on the air? We're leaving some money on the table. But how?*

First, he studied Fischer's face, and then looked at Mrs. Kurger.

No clues there. She always did know how to get the best rate and the best times out of that Rate Card.

Then he turned to examine Roy Copenhaver. *No. Anyone who's doing the kind of work he's been doing will know better than to give anything away.*

Finally, Marc turned his attention to Roy's wife Jennifer. His eyes went wide and he practically yelled, "That's it. They *are* getting money in the fan mail!"

Jennifer turned white. Everyone in the room turned their full attention to Der Kronz and his explanation of his deduction.

"You've been receiving more than fan mail, you've been getting cash! We were thinking it might just be from increased church attendance. But, no." Turning to Fischer, Marc laid out his case. "I know you haven't been asking for it, Reverend. I know you haven't even given out an address to send it to, but for some reason listeners are being compelled to send you donations."

Marc was amazed at the thought. Here he had spent his life learning the secret of using words to get people to give him money. Now this preacher just gets on the air for five minutes every second week and has money cascading over him like Schwarza Falls. Marc was in awe!

"Is that true, Roy?" John asked.

"Yeah. We certainly didn't expect it. We for sure didn't ask for it. But for some reason the Holy Spirit saw fit to have an awful lot of conversations with an awful lot of people out there about supporting Reverend Fischer's word."

Turning to his wife, whose eyes were beginning to fill with tears, Roy added, "Don't worry, dear. I

should have realized that this would happen. We should have let you leave after you finished up the programming issues."

Still holding his wife's hand, Roy looked back to John. "We got every currency we've ever heard of and some even Maria hadn't. But they are all denominations of that new paper money the area governments have begun issuing, and some stock shares, neatly sealed inside the folded letters. A lot of people sent small, light, silver coins completely covered by the wax seal.

Then, Roy addressed Marc. "So, how did you figure it out, Marc?"

Beaming, Marc explained. "It's something up-timers call a 'tell.' Gamblers watch their opponents for ticks or gestures that indicate they are bluffing. I'd noticed Jennifer freezing when the issue of your fan mail came up. But, when she was talking about her programming ideas, she was enthusiastic, inspired even. Then when money was mentioned again, her face froze.

"At first, I thought she wasn't comfortable dealing with money, but it dawned on me. Mrs. Covenhaver is not just any up-timer, but the wife of a man who built his career dealing with money. Surely, she's been in these situations before. It should be second nature, unless . . ."

"Unless we had a hole card." Roy finished. "Very good indeed, Marc. Maybe I need to get you drafted to come and help me with my negotiations over in Fulda."

After some laughter, Roy got back to the subject. "We're still committed to no solicitations on the air. What we plan to do is to steal your idea of sending out flyers to teach listeners how to build crystal sets. Our flyer will be the song sheet of the featured song of each program. On the back we'll include a little Bible lesson and let the recipient know that if they enjoyed the song and wanted to support our work, they could send us any donation they felt it worth to them.

"We're prepared to give you a cut of all proceeds. We'll keep the VOA address only on those flyers. Each week Maria or someone representing her can come by and open all the mail in front of your people. What kind of percentage do you want?" With that, Roy shut up.

John grinned. "I suspected there was money in those envelopes. I just couldn't figure out how you were getting listeners to send it in. So Marc, what kind of split seems fair? Remember, this is a religious organization."

Marc had been ready with his answer until John brought that up. Marc recalled the kindness that had always been shown to him as a Jew in this community. He even had very clear memories of dealings with a good number of the members of this Pentecostal Church. With that in mind, he answered, "I think we should accept it as a tithe, Mr. Grover. Ten percent of all mailed in donations on top of all the financial conditions we've worked out before. That would be fair."

The people from the church seemed taken back at this act of generosity from the station sales manager. His reputation for increasing his pricing at the drop of a hat was well earned.

"That certainly is fair, Marc. Okay, Roy. We've got ourselves a deal."

"So when can we start, John?"

John asked, "How soon can we clear an hour on Saturday, Marc?"

Marc briefly thought through his ad commitments. "Think you can be ready this Saturday night, Mr. and Mrs. Copenhaver? That will give you three shows before Christmas."

Roy responded, "Absolutely! We'll be ready."

Fischer paid very little attention to the details. His mind was spinning over the size of the congregation he would be able to reach every week. *Surely The Holy Spirit is guiding me toward the mission that Reverend Chalker foresaw that first Bible study. Praise the Lord!*

Chapter Nine

"And now a programming note, be sure to join us this Saturday night at six thirty for the brand new show, The Ole Timey Radio Hour featuring live blue grass, country, and gospel music, singing, fun, and the best talent Europe has to offer. That's The Ole Timey Radio Hour, hosted by Reverend Dieter Fischer, this Saturday night at six thirty on Your Voice of America!"

Susannah Becker was busily emptying the contents of one almost-finished bowl into its replacement full bowl when she spotted the girls. Every week the Bible study had attracted more and more visitors who still attended their regular denomination churches on Sundays. Now with the word out about a big announcement about the church and the radio, it seemed like everyone who had ever attended was packed into Slater's barn tonight.

With the noise that the fiddle group up on stage was making, she couldn't start up a conversation yet, but Susannah made a mental note to do so at the earliest opportunity. Both girls were dressed very nicely. Not anything that she would wear, with her Mennonite background, but not dressier either. It was just something about the way they wore their clothes that made Susannah think there was something special about them.

After the last of the music, Brother Fischer walked on stage carrying the church rocking chair.

"As Brother Chalker would say," Fischer jiggled his jaw and puffed his cheeks before continuing in a scratchy voice, "Well, I guess it's time we got started."

After enjoying the laughter at the dead-on impression, Fischer continued, "First, let's thank Brother and Sister Slater and Phyllis Dobbs for hosting our Bible study in their barn throughout the winter. I also wanted to convey Reverend Chalker's best wishes and to let you know that he continues to improve and hopes that the doctor will let him sit here before you on Monday night real soon."

Fischer continued with a list of prayer requests for individuals associated with the church, and thanks for answered prayers. After briefly bowing his head and saying thanks for the Lord's work, he came to the big announcement about the radio program. There was a lot of applause at this. Fischer outlined how the church was going to handle it, how they would be holding auditions with the finalists featured on the program to be chosen right here before weekly Bible study. He finished by asking for volunteers to help get everything ready.

"I want you all to pray for Elder Jennifer Copenhaver. She's agreed to the chore of being in charge of all

the musical parts of this new venture. Since she's dropping her pre-nursing course, I guess that will leave the nursing duties in the Copenhaver family to her sister-in-law, Gloria. Let's all let Jennifer know how grateful we are for this sacrifice." After leading the prayer, Fischer continued with the Bible study passages for the night.

Susannah finished cleaning up the dinner plates and was walking back into the barn. Looking around, she again noticed the two girls she'd seen earlier sitting in back and eased into an open spot on the bench right beside them.

As they followed along in their own Bibles, Susannah studied the girls more carefully. They did not have the hands of commoners, they certainly weren't up-timers, and while those clothes looked in place, the stitching was much better than what could be seen in most clothing not produced by a sewing machine.

One innovation Fischer had brought to Bible study was to give time for those in attendance to discuss an occasional passage amongst themselves after he had given his thoughts. This allowed Susannah to introduce herself to these young women.

Their names were Constanzia Garb and Catharina Sulzer. Cousins on their mother's side, Constanzia had been visiting her cousin and her family in Badenburg. Constanzia had gotten a job teaching Italian and French at the high school through Constanzia's older half brother Johann Martin Sulzer who had been teaching science at the school for over a year. Catharina had gotten a job at the school library. Still no explanation of the clothing, but Susannah figured that if these girls could survive in a high school with a bunch of teenagers, they must be good girls. And they were single.

After Bible study, Susannah found it very easy to keep Constanzia and Catharina engaged in conversation as she subtly guided them to the front of the barn. Catching Fischer's eye, she waved him over. "Reverend Dieter Fischer, I'd like to introduce you to two guests. This is Constanzia Garb and her cousin Catharina Sulzer. They are teachers at the high school!"

Fischer smiled warmly as he shook hands with the women, "Thank you for coming, ladies. You're always welcome at our church."

"Thank you, Reverend. We heard you on the radio a few weeks ago and visited last Sunday. I've been trying to get my cousin here." Catharina grinned at her cousin. "She hasn't had as much time as I have to get used to the open approach to religion that the up-timers brought us."

"I understand completely." Fischer smiled. "Before coming to Grantville, I was a Lutheran pastor myself. The revelation that Reverend Chalker and this congregation have shown me is that God directly guides each of us. We must honor the guidance being given to all, even if it seems to contradict what He has in mind for us."

So it is true he had been a Lutheran pastor, Constanzia thought. Maybe my family won't object if I were to get to know this man better.

At the same time Catharina thought, No, not for me, but this man is fine husband material.

* * *

Back when Gayle Mason had been married, her truck-driving husband arranged for a few days off between loads in Memphis, Tennessee. Gayle flew down to join him and they did a whirlwind tour of that rockabilly Mecca. In addition to Graceland and rubbed barbecue, they paid homage to the place it all

began, 706 Union Avenue, the home of Sun Records.

So when Gayle decided to finish her new home's basement for her electronics workshop and ham station and saw the exact style of acoustic tile used in the recording studio where everyone from Johnny Cash to Jerry Lee Lewis to the King himself recorded their breakout hits, how could she turn it down? It took some more research to find the exact dimensions of the main recording studio at Sun Records, but down to the positions of the doors and windows and electrical plugs, Gayle's new basement was a complete clone.

She set up her control room in the area under the front porch, where the only deviation was in keeping the two diamond shaped windows that overlooked Buffalo Creek.

Now, on this Saturday night for the very first time since Gayle had finished her basement-remodeling project, the perfect studio was about to be used as it was meant to be. Microphones were set up in several corners of the room so one act could follow another seamlessly. People were sitting around tuning guitars and fiddles and adjusting their drums.

By the time Jennifer Copenhaver arrived to warm up the voices of her handpicked studio choir, even Sam Phillips wouldn't have known that he wasn't in Memphis.

* * *

"All right now," Jennifer said with five minutes to show time. "Everyone sounded great last night at the dress rehearsal and everyone will sound great tonight. Just remember that the trick to performing in front of an audience isn't to get rid of those butterflies in your stomach, but to get them all to fly in formation!"

When the old public speaking joke brought the intended laughter, Jennifer felt that her part of the show at least, would run smoothly.

Fischer's part was more complicated. After he was introduced, he pretty much had to orchestrate the rest of the show. He had written a script, which had sounded a little stiff to him last night, but the rest of the cast assured him it was fine.

In the control room, first night jitters were in full display as well. Jacob Blackman read his news like normal. But, Deanna Dee Matowski and Jennifer Hanson were present to oversee anything they might have forgotten in the run through. Jon Fredric, the normal Saturday night DJ was on his best behavior. In fact, all week he had been staying after the station went off the air, practicing up for this, the biggest production that VOA had attempted so far. Just to be sure, in the recording studio stood two other VOA employees ready to replace a faulty mike or to move a pesky cord.

All those present, cast and crew, seemed to look to one another for reassurance that everything was going to be okay when Jon flipped a switch starting up the VOA end of news sounder, held his hand up over his head and counted down, "Five, four, three, two . . ."

* * *

"Turn your radio on . . ." Jennifer held the note just a bit longer before she cued her choir to come in. "Turn your radio on. (Turn your radio on)."

Over the sound of the choir, Thomas Werner, another down-timer congregant who had been drafted due to his rich baritone voice, broke in, "Welcome to the first performance of *The Ole Timey Radio*

Hour on Your Voice of America! And now, your host, the Reverend Dieter Fischer!"

As Jon cut back the microphones to the choir, Fischer introduced the various members of the cast that would be performing tonight. He closed out by introducing the next act, which played "Guitars Pickin', Fiddles Wailin'!"

When they broke for the first set of commercials, everyone looked relieved. With their confidence restored, they were all excited to begin again. Song after song went smoothly.

During the children's story segment in the second fifteen-minute block, one child decided that he'd rather play with the drums than sit and listen to the story. Deanna had to pick him up and stick a piece of candy in his mouth to keep him quiet. They had decided not to use a lot of scripted humor on this first show. It was too risky, but the other segues they put between acts worked as they were written.

After the local newsbreak at the bottom of the hour, Fischer announced the contest for a chance to perform live on the air. The first three contestants would be featured on the show right before Christmas with listeners' mail determining the winner. Finally it was time to perform the featured song of the night.

"Welcome back my friends," Fischer began again. "At some time in the future that was, a small congregation in Oberndorf, near Salzburg, heard a song that became the favorite Christmas season song for centuries to come. Tonight, join us as Jennifer Copenhaver performs what we believe is going to become your favorite song of this season accompanied only by her choir. Here then is 'Silent Night.'"

Jennifer began slowly singing the first verse of that old standby. By the time the choir joined in with the chorus, listeners all over were absolutely quiet. Most were hearing this remarkable composition for the very first time. By the final verse, in family rooms and public places all over the coverage area of VOA, you could hear voices joining in singing the chorus on their own.



*"Stille Nacht! Heilige Nacht!
Hirten erst kundgemacht
Durch der Engel Alleluja,
Tönt es laut bei Ferne und Nah:*

*Jesus der Retter ist da!
Jesus der Retter ist da!"*

When Jennifer finished up the last line, Fischer stepped up to the microphone, "Wouldn't you love to have a copy of that beautiful song for you and your family to share? That's the featured song of tonight's show and we'll send it to you. Free and without any postage costs either way, if you'll just write into us asking for Featured Song, Show One, Care of Voice of America, One Mountaineer Lane, Grantville, United States of Europe. It's our gift to you this special season."

After repeating the address and offer a second time, Fischer cued Jennifer and her choir to sing the closing song as he bade goodbye to the listeners.

* * *

To be continued . . .

Stretching Out, Part Six: King of the Jungle

Written by Iver P. Cooper



***Paramaribo (Gustavus), Suriname
Short Dry Season (February-March, 1635)***

"My children. Help find?" The Dutch words were painfully enunciated, clearly learned by rote.

Maria Vorst put down the chalk with which she had been drawing, and studied the questioner. The tall black man, by his markings, was Coromantee. They were the people living in what the up-timers called Ghana. He was one of the two hundred or so slaves who the Gustavans had freed from the distressed

slave ship *Tritón* when it had come hunting for drinking water.

Perhaps half of the slaves knew some Portuguese, either because their tribes had traded with the Portuguese, or because they learned it after their capture. Only a few knew Dutch, the Dutch presence in Africa being more recent and more limited.

Unfortunately, the Gustavans were mostly Dutch and German, and hardly any of them knew Portuguese. Maria, despite being far better educated than the rest of the colonists, didn't know much herself, although she was trying to fit language lessons into her schedule.

Fortunately, her teacher was nearby. "Mauricio, come here please!" Mauricio, a freed *mulatto*, born in Portuguese Brazil, had been trained there as a scribe and interpreter. Because of the large slave population in Brazil, he knew African, as well as European, languages. Once, he and Henrique had lived in Recife, and Mauricio had gone time after time to the dock to meet and greet, in his capacity as interpreter, the "wild" slaves, just delivered there to work on the sugar plantations. Most came from Angola, but there were slaves from all over Africa.

Maria remembered that there had been a few children among the slaves they had freed. She explained the situation to Mauricio and had him translate. "What are your children's names? How old are they? What do they look like?"

Mauricio turned to the Coromantee. They spoke rapidly together, first in Portuguese, and then in the Twi dialect of Akan.

"I am Kojo of the Asante. My boy Manu has seen thirteen summers, and his sister Mansa, eleven." Kojo described them.

"Where did you see them last?"

The answer was not what Maria expected.

"In Edina."

"Edina?" interjected her companion, Mauricio. "You mean São Jorge da Mina?" The man nodded.

Mauricio turned to Maria. "He was separated from his children back in Africa, in the Portuguese fortress you Dutch call Elmina."

"Elmina? My husband, may God rest his soul, spoke of it once, as a place of great trade. Somewhat enviously, I must say."

Mauricio nodded. "Enviously? That's for sure. The Dutch tried to take Elmina in 1625." He paused. "Where is this husband of yours, by the way?"

"He was lost at sea," Maria said.

"I'm sorry."

"Thank you. It was years ago. And to be honest, I didn't know him all that well."

"Anyway," Mauricio continued, "Elmina was the first Portuguese base in Africa. On what we call the

'Gold Coast.' A century ago, it accounted for a tenth of the entire gold trade. There's still gold mined in that area, but nowadays Elmina is mostly a slave depot. Dozens of slave ships visit every year."

"Does he know which ship they were put on? Not the name, of course, but can he describe it? The number of masts? Or of its gunports? The figurehead?"

"I'll ask." He questioned Cojo further, then shook his head.

"Sorry, Maria. They don't give the captives the run of the fort you know. The children were taken first. He saw them at one point, in a different pen, so they were there when he arrived, but the guards didn't let him join them and they were sold off before he was. When he was put on the *Tritón*, he hoped that it would take him to the same place."

"So, is it hopeless? What do we tell him, Mauricio?"

Mauricio suddenly looked much older than usual. "I don't know. It does seem hopeless. If I think of something, I will let you know. In the meantime, all I can do is say that we will pray that they are safe, and that if we learn anything about their whereabouts, we will tell him right away."

"That seems so . . . ineffectual."

Mauricio shrugged.

"Wait," said Maria. "If he can provide a good enough description, I can draw them. Then you and he can show the drawings around, see if anyone knows more. And at worst, perhaps the drawings will give him some comfort."



Mauricio explained what Maria wanted to do. Maria didn't want to waste her precious paper, so she drew on a piece of slate. It was easier to erase that way, too. She decided to try to draw the boy first, guessing that his features would be similar to, but younger than, his father's. She erased a line here and added a curve there until the father seem satisfied.

Then she pulled out a second slate, duplicated the boy's picture, and then had Mauricio find out what needed to be changed for it to represent the girl. That took quite a bit more give and take, but at last it

was done.

Then she made a copy to paper of the images of the boy and girl, for Mauricio, and gave the slates to the Coromantee. She had plenty of slate from one of her expeditions upriver.

"I hope this helps," said Maria.

* * *

The Coromantee reverently set down the slates. He had been pleasantly surprised to discover that one of the whites was a *tindana*, a priestess of the Earth Goddess. Who else would place a magical incantation on a rock?

Now she had blessed him with a talisman by which he could speak to his children. Perhaps even call them back to him.

He had almost lost hope, had contemplated walking into the Great Sea.

He wondered how he could possibly repay her.

* * *

"Blue or red?" said Johann Mueller, spreading his hands, each pointing at a different pile of beads.

The young Eboe woman reached slowly toward a blue bead, then jerked her hand back. Two Eboe matrons, baskets on top of their heads, watched the interplay. Johann had no idea what they were saying, but he fancied they were placing bets on which color his customer would settle on.

Business had been good. The Eboe were very fond of beads. Both men and women were accustomed to wearing beaded necklaces. Since they had come to the New World as slaves, they had only whatever they had been wearing when they were sold to European slavers. And once they were freed, they wanted to adorn themselves, to distinguish themselves from their companions.

To buy beads, or anything else, they needed something to trade. And that meant that they needed to fish, hunt, grow crops, mine, or craft artifacts. Either on their own account, or as contract labor. Samuel Johnson's epigram—about liberty being the choice of working or starving—was known only in countries exposed to up-time literature, but the Africans were quick to appreciate the limits of the liberty the Gustavans had conferred upon them.

Of course, thought Johann, they were no worse off than the Gustavans in that regard. It was fortunate that the slave ship still had several months supply of food. Better yet, they had seeds to plant. Mauricio had told Johann that there was an Eboe insult, "I bet you even eat your yam seeds." The colonists had supplied water, and they had made and sold farm implements to the Africans, but they were expecting a return.

"Hello, Johann, how's business?" asked Mauricio.

Johann jumped. If Johann were a superstitious man, he might worry that his thoughts had summoned Mauricio.

"Fine, fine. Would you ask this young lady whether she has made up her mind?" Mauricio did so. She

ended up trading for an equal number of both colors.

Mauricio walked over to the watching women. He held up the drawings Maria had made. "Did you see these Coromantee children before you boarded the giant canoe with the white wings?" That was, more or less, the proper way to describe a European sailing ship.

They shook their heads.

He heard a cough behind him. He turned, and saw Heinrich Bender. "Teach me some Portuguese, Mauricio. I need to be able to bargain with the blacks."

"What do you want to know?"

Heinrich smiled. "You can start with 'How much?' and 'Too much.'"

Mauricio laughed. "I should start a school."

"You should, Mauricio. You've been teaching Portuguese to Maria, I know, so why not teach a bunch of people at once?"

"I could, I suppose. Although Maria knows Latin, which makes it much easier for her than it would be for you German peasants." Mauricio smiled to show he was joking.

"I mean it, Mauricio. Teach Portuguese to us, and English or German to Africans. Earn some money."

"Perhaps I will. I can teach the Mandinka trade talk, too. The problem isn't just us talking to the Africans, it's getting them talking to each other."

* * *

The Eboe stood up, shading his eyes with one hand and hefting his fishing spear in the other. He kept his balance in the canoe with the ease of long practice. He had often gone fishing on the Niger and its tributaries. The dugout canoe, made by one of the local Surinamese Indians, was made from a strange tree, but he had learned to handle it quickly enough.

It was a good time to fish; early on a Sunday morning, when the colonists of Gustavus, across the river, were at prayer, or enjoying their day of rest.

There. A dark shape in the water. He threw.

Missed. The float bobbed in the water, as if it were laughing at him. He shrugged philosophically, and pulled on the retrieval line. He took in a few feet and then it resisted. Clearly, the spear was caught in something.

Back home, he might have chosen to abandon the spear. Here, he couldn't afford to do so. The Gustavans had freed the blacks, but that didn't mean that they felt obliged to give them much in the way of goods. For anything more than water, and a bit of food, they expected the blacks to work. The

hospitality of the Indian tribes also had its limits.

He didn't care about the spear shaft—there was plenty of wood around—but a metal spear point, made by the Gustavan smith . . . that was another matter.

He tied the near end of the rope about the canoe, as best he could, and then dived into the water.

When, he emerged, his teeth were chattering. Not with cold, but with fright. There was a boat, with dead men, resting on the shallow river bottom. And not just any men, but the terrible white men who had taken them across the Great Sea. Had they turned into river demons?

He clambered into the canoe and just lay there, trying to calm down. The pleasant warmth of the sun had a lulling effect. He drew a knife, and was about to cut the rope away and head back to shore, when he had a change of heart.

If the bad men turned into river demons, surely they would have drowned someone weeks ago. And there would have been talk.

So these were just dead men. Dead men still holding their weapons, and with other valuable goods on their persons.

Who needs a spear shaft, if one has a sword? he thought. And with that, he paddled the boat closer to the sunken longboat, and then jumped back into the water.

Some time later, he beached the canoe, and gazed with satisfaction at the pile of goods heaped beside him. A half dozen cutlasses, a gold bracelet, and other odds and ends. He was rich now, by the standards of the ex-slaves. Rich beyond his wildest dreams.

With this, he would be an *ozo*, a big man. A giver of great gifts. And when he ran out, he could slip back here, and collect more goods. He would have a round stool, with three legs, and a stool carrier. He would have the town smith make him an iron staff, with bells attached. He would wear a red hat.

As he mused over these attractive possibilities, he was grabbed from behind. He tried to reach for one of the weapons so close to his feet, but the attackers pulled him back, away from the canoe, and tapped the side of his head with a war club.

When he came to, he was hanging, head down. One of his fellow ex-slaves, from an unfamiliar tribe, was studying him. Three others, who seemed from their markings to be of the same tribe, lounged nearby.

"Ah," the warrior said to his fellows, "our fish is squirming. Should we toss him back into the water, or throw him into the pot?" His filed teeth suggested that this was not a metaphor.

The Eboe had no idea what they were saying, but was pretty sure it didn't bode well for him. He began pleading for his life, first in his native tongue, then in Mandinka trade talk.

The warrior held up one of the weapons. "Where did you get these?"

"Spare me, and I will show where to find more."

Near modern Paranam, Suriname

Heinrich Bender held up the chunk of rock. "This is what we are looking for." Kojo had asked Mauricio whether the Gustavans had any mines, and one thing had led to another.

Kojo, and the two Coromantee he had brought with him, studied the specimen. Kojo took it in his hand, then returned it with a moue of distaste.

"Worthless clay. We gold miners, not dirt farmers."

"This is bauxite," said Henrich. "Very useful. Back home they can make it into a metal which looks like silver but is as almost as light as wood. The Americans call it 'aluminum.'"

"You smelt it?" The Coromantees had been smithing for centuries.

"Not exactly. Uh—Maria, could you explain?"

Maria had researched the possible products of Suriname before the expedition was launched. She knew more about aluminum than anyone else west of the Line of Tordesillas.

"We wash the bauxite with hot lye to make alumina, and then we run electricity through a mixture of alumina and cryolite to melt it down and transform it."

"What is cryolite?"

"It is a stone that it is found in Greenland—that is a land far to the north, where it is so cold that the water is hard like rock. "

The Coromantees digested this information. *Magic stone* , they thought.

"And electricity?"

"That is like lightning."

Any doubts which Kojo's fellow Coromantees had, as to whether Maria was as powerful a priestess as Kojo had told them, were now dispelled.

"Anyway," said Heinrich, "don't worry too much about the color—it can be white, yellow, red or brown. It is soft, so soft I can scratch like this, see? " He scratched with his fingernail. "But the real proof is that it has this funny 'raisin pie' texture." He pointed at one of the little pea-sized concretions.

"And where do we find it?"

"It is usually easiest to dig it up from the sides of stream banks."

Kojo flashed his teeth. "Fine. Now let's talk price."

The Gustavans didn't care for digging in the constant heat and humidity; it was worse than farming. So they were happy to give the Coromantee the opportunity to mine the bauxite.

Of course, that meant that the Coromantee had to be allowed to shift their village to the west side of the river, the Gustavus side, since that's where the known deposits were. The colonists debated this a bit, but Carsten Claus, the acting governor of the colony, pointed out that the deposits were still more than a day's march south of Gustavus, and so the Gustavans didn't have to worry about casual thievery on the part of their new neighbors.

What really clinched the deal was when Heyndrick de Liefde, who was the cousin of the colony's founder, David de Vries, suggested that the Coromantee would act as a buffer if the English colony further south, at Marshall's Creek, got restive. There were many Dutch among the colonists, and given the treacherous attack by the English on the Dutch fleet at the Battle of Ostend, they weren't happy about the proximity of the English, who had come before them to Suriname.

Only some of the Coromantees made the move. As Mauricio told the Gustavans, the word "Coromantee" just meant any slave who was sold out of the port of Kormantin. So it included Asante, Denkyira, Fante, Akwamu, and of course slaves from further north. Kojo was Asante. It was his people, and the Denkyira, who controlled the gold fields of Ghana. The Akwamu were to the east, but they were very friendly with the Asante, so they came, too, albeit as farmers, not miners. The Fante were fisher folk, somewhat hostile to the Asante, and decided to stay near Fort Lincoln.

* * *

Borguri, who had been the highest ranking of all the Imbangala on board the *Tritón*, had declared himself their chief when they were freed by the Gustavans. He fought two duels to secure his position, but in view of their small number, had declined to kill either challenger. To make sure that they didn't consider this a sign of weakness, he beat them to within an inch of their lives. They now obeyed him with seemingly doglike devotion.

It was a pity, he thought, that the guns recovered from the longboat were unusable. But he kept them. If his warriors carried them openly, their opponents would think that they worked, and would respond accordingly. They might flee, instead of charging, perhaps. And, if they weren't fooled, well, the guns were reasonably good war clubs.

The freed slaves had divided into groups along tribal lines, and spread out in the area east of the Suriname River. The Imbangala had raided the weakest of the nearby groups, for provisions and tools that might be used as weapons, but since the Africans started with the little in the way of possessions, they weren't very productive targets. Not yet, at least.

For the moment, while the Imbangala regained their strength, they concentrated on stealing, not killing. The only exception was if they encountered any of the Ndongo, who they had fought back in what an up-timer would call Angola. 'Ngola was the title of the Ndongo king, Nzinga. Who actually was a queen.

The white traders who circulated among the African settlements were more tempting prey. But Borguri wasn't ready to attack the whites yet. Not even those traders, let alone the white colony west of the river. The whites were too well armed, he didn't want to draw their attention yet. His warriors could steal from the whites, if they could avoid being spotted, but no more. If spotted, they must just flee. No killing. Yet.

The Indians, now. . . . At first, the Imbangala had avoided confrontations with them. After all, this was their land. Who knew what spirit protections they had? And of course they had missile weapons, which the Imbangala had to make for themselves. But the Imbangala's contempt for the Indians grew. They were clearly primitives, like the upriver Africans the Imbangala captured for sale to the Portuguese.

The Imbangala chief studied the Indian villages nearest to the Imbangala camp. When did they hunt, what weapons did they carry, did they make war on other villages, did they set sentries when they held festivals. After some time, he picked the Imbangala's first native target.

The Indians had been drinking *piwari* all day and night. They were ripe for the plucking. There was just one more matter to attend to.

Borguri looked at the Eboe fisherman. His head had been shaved, and ashes from the Imbangala hearth fire sprinkled over it, to erase his old identity, to remove him from the protection of his ancestral spirits. Assuming that they cared what happened to him across the Great Sea. In the ordinary course of things, in a few weeks he would go through a binding ritual which would make him property of Imbangala's lineage, and drive thoughts of escape from his mind.

But no war party could set forth without at least one human sacrifice, to please the gods and feed the warriors.

* * *

Mauricio spoke to the sentry. "I need to talk to him." The guard shrugged. "Watch your step."

Mauricio took a deep breath and entered the hut. The change in illumination, from the high tropical sun to the indoor gloom, was stunning. It was several minutes before he could see much beyond the tip of his nose, and he said nothing until his eyes adjusted. At last he could make out the dark figure sleeping, or pretending to sleep, at the far end of the hut, his arms and legs both shackled, and the leg shackles in turn fastened to a chain which circled the great tree trunk that rose from the ground, piercing the roof of the hut.

"I have a few questions for you."

"Do you now? Come a little closer, so I can hear you better." The erstwhile slaver captain rattled his chain. "It's not as though I can come closer to you."

"I'll just speak louder, thanks," said Mauricio. The first day after his capture, the captain had half-strangled the man who brought him food. The captain was then punished, by being given nothing to eat for several days, and was fed only after he apologized properly. Mauricio was not especially reassured by this expression of contrition.

The captain laughed and laughed, then stopped abruptly. "Well, well, I am a busy man, as you can see. So be quick about it."

"It's a small matter. One of the Coromantee said that his two children were kidnapped and taken to Elmina for sale. He pursued the kidnappers and was captured in turn."

The captain snickered.

"He spotted the children in a pen, but that was all."

"How old were they?"

"The boy thirteen, the girl eleven."

"Ah, a good age. They can be trained as domestic servants, or be taught a trade and hired out. Of course, they are long-term investments. "

Mauricio suppressed the urge to strangle the captain. "So, do you know what happened to them?"

"I can make a educated guess. But what's in it for me?"

Mauricio hesitated. He had already read the ship's log, and quizzed all of the other survivors of the slaver's crew. The captain, damn his soul, was Mauricio's last hope.

"I suppose I could do something about your rations, if I thought your answer was sufficiently helpful."

"My rations, eh? Well, that's not good enough. I want my freedom."

Mauricio turned and started to walk out.

"Wait, young fellow." Mauricio stopped.

"They can put a ball on this chain and let me walk about a bit, outside. Where would I run to, after all? If the Africans didn't get me, the Indians would."

"I promise that if you give me the information I need, I will speak to the governor, and request this boon."

"Not on *my* behalf. As a favor to you for all the . . . assistance . . . you have given him. To redeem your word."

"Yes, as a favor to me! Now talk, damn you!"

* * *

The attack took the Indians by surprise. The men were too drunk to put up a fight at all. The women weren't in much better state.



The men of warrior age were slain and eaten, to the horror of their kin. Not that cannibalism was unknown in South America, but of course the Africans had different rituals and so far as the Indians were

concerned, what the Imbangala were doing was completely wrong!

The younger boys were gathered together. They would be taught, brutally, that they were now Imbangala. The young women would become wives of the senior Imbangala warriors, and the older men and women would be put to work, as slaves, in the fields. If the old men thought that farming was beneath their dignity they would be beaten until they rethought the matter.

A week or so after the assault, one of the young women managed to escape. Tetube hid in an old hunter's shelter that her brother had once pointed out, until the Imbangala tired of searching for her. Then she slipped down river.

Long Rainy Season (April to July, 1635)

Carsten raised his hands. "All right, I can't hear anyone if you all talk at once."

"We've had goods stolen, time and again," one colonist, who frequently made trading forays across the river, complained.

"Anyone killed?"

"Not yet," the trader admitted.

"That's not all," said a second colonist. "The Africans are already killing each other."

"Are you surprised?" asked Henrique, Mauricio's white half-brother. "It's not as though they were all that friendly back in Africa, you know. That's how at least half of them ended up as slaves in the first place. They fight these little wars, and the prisoners get sold."

"So the villages are armed camps, now," added the trader. "It makes it tough to do business. The Africans are thinking more about fighting than about farming, I assure you. They have less to trade and sooner or later some nervous sentry is going to shoot an arrow or throw a spear into one of us."

"We just find out who started it, and teach them a lesson," said Heyndrick. "That's what cousin David did with the Indians in America."

"You mean kill them?" asked Michael Krueger. "I have a better idea. If a tribe can't keep its people from stealing or killing, then I think it should be considered lawful to re-enslave them all."

"Ah, lawful war," said Mauricio. "The Portuguese did that in Brazil, with the Indians. Funny thing was, there always seemed to be a lawful reason to enslave any tribe which was too weak to resist."

Henrique held up his hand. "There's worse news."

Carsten gave Henrique his full attention. He knew that Henrique was a woodsman, and he and Mauricio's Manao Indian brother-in-law, Coqui, moved freely among the Indians in the affected region. "What?"

"We've had reports that some of the Africans have real weapons. Steel swords. Guns even. Some

Indian villages have been attacked."

"Where could they get them from?" Carsten wondered, aloud.

"The Spanish. Or the Portuguese," Denys Zager suggested. He scowled at Henrique and Mauricio.

Henrique scowled right back. "We are wanted men in Brazil. And Maria and Heyndrick transported us here, from hundreds of miles away. They can vouch for the fact that we brought only our personal weapons with us."

Zager folded his arms across his beer barrel chest. "You say you're refugees, but how do we know? Perhaps your Indian friends are helping you smuggle weapons here from your friends in Brazil."

"Enough," said Carsten firmly. "The accusation is ridiculous. Please don't distract us from the real problem."

"Perhaps," Maria offered tentatively, "we should help the good Africans, the ones who are just trying to defend themselves, deal with the troublemakers themselves."

"You mean, give arms to the 'good' Africans? That's crazy."

Carsten clapped his hands. "We will try to figure out which Africans are the source of the problem, and deal with them. With or without African allies, as seems best at the time.

"For the moment, the Africans who wish to trade will have to come to us, not us to them. We'll set up a trading post just outside Fort Lincoln. We'll strengthen the inland defenses there, too. And I think we better institute river patrols. Hopefully, the blacks'll all calm down after a while."

* * *

Borguri held out his favorite whetstone, and one of his new Arawak wives dutifully poured water over it, letting the liquid cascade down into a waiting basin. A tied-up African watched in fear, not knowing what would happen next.

He pointed to the basin. "Drink," he ordered. The cowering captive complied.

Borguri then hit him over the head with the stone. "My sword serves me, my stone serves my sword, my water washes my stone, you have drunk my water. Your ancestors have forgotten you; mine watch your every move, your every thought. You are mine."

He gave the slave a playful cuff, and ordered, "Back to work."

The slave should be thankful. Now that he was officially part of Borguri's lineage—albeit at the lowest level—he was unlikely to be picked as a pre-battle sacrifice.

Borguri frowned. The process of assimilation just wasn't fast enough. Borguri needed a cadre of true Imbangala to serve as role-models for the coerced recruits, and to discipline those who didn't comply with the rules. There were only so many new recruits he could absorb within a period of a few months.

But if he took too long to build up his strength, the Ndonggo would make or buy themselves decent weapons, and counterattack.

So Borguri had made a decision. Just as the Imbangala of old had allied themselves to the Portuguese, Borguri would ally his tribe to one of the Carib Indian tribes. One which, he had learned, was not happy about the white presence in their vicinity. Borguri felt confident that they would be delighted by the prospect of revenge and plunder which Borguri would hold out to them.

Of course, once the whites were driven out, the Caribs would no doubt turn upon the Imbangala.

Except that the Imbangala would turn on them first.

* * *

Mauricio walked up beside Maria, coughed. "About that Coromantee man."

Maria looked up. "Yes? You thought of something?"

"I questioned the crew. Even the captain. They didn't remember the children, of course. What're two slaves among hundreds? But they did know which ship left Elmina before they did. And where it was headed."

"Well?"

"The *Fenix*. Bound for Havana."

"Well, that's something. I imagine there would be records of who was sold out of which ship, to which plantation. And there can't have been that many children. But he certainly can't go there and ask, can he?"

"He would need to learn Spanish of course. And if he didn't want to be a slave within seconds after stepping onto the dock, he would need a letter of manumission. Preferably, from a Spanish source."

"Henrique could write the letter, couldn't he? Portugal being under the Spanish crown, they would honor a Portuguese document. And I wouldn't think a minor port official in Santo Domingo is going to have been informed that Henrique is a heretic."

"Probably not. But then there's the other problem. The financial one. He would have to buy his children. And he doesn't have any money."

"Well, it's going to take him months, if not years, to learn Spanish, and more important how he must act if he wants to be successful. The important thing is that we can give him a reason to hope."

A moment later she added, "A reason to live."

* * *

Carsten Claus looked out across the expanse of the Suriname. The river was perhaps half a mile across here. The vegetation on the far bank was dense; there could be an army of Africans hiding there, for all he knew. He wished he knew how the troublemakers were arming themselves. He suspected that the Portuguese in Belem do Para, or the Spanish in Santiago de León de Caracas, were involved, to harass the USE. But would they arm slaves who had been taken off a Portuguese-crewed, Spanish-licensed ship? Could any of the colonists have been so short-sighted as to sell arms to the ex-slaves without

permission?

To reassure the colonists, he had put the *Eikhoorn* on river patrol duty, and banned the Africans from fishing within a mile of the colony. He was waiting for the *Eikhoorn* to return from upriver; he had some questions for its skipper. But what he wanted most of all was for David de Vries to show up with a ship of force, and more colonists, so that they clearly outpowered and outnumbered the Africans. David should have been here a month ago.

At least, if their African informants were correct, he could now put a name to the problem: Imbangala. Mauricio, sitting beside Carsten, had just explained to him that since 1615, the Portuguese of Luanda had used the Imbangala as mercenaries in their wars with Ndongo. Ndongo warriors, if captured in battle, were exported to the New World to work on plantations and in the mines. But the Imbangala? Since they were allies of the Portuguese in Luanda, Mauricio hadn't expected to find them sold into slavery. Perhaps these had disobeyed orders? Or had the Portuguese beaten the Ndongo into submission, and decided the Imbangala had outlived their usefulness?

Carsten expressed the hope that the Gustavans' African friends were, indeed, friends. Mauricio nodded, but offered no reassurances on that score. They sat in silence for a few minutes, then both realized simultaneously that they were no longer alone, and turned their heads.

"Forgive the interruption," said Maria.

Carsten forced a smile. "How can a visit from you be considered an interruption?"

"You perhaps know that Mauricio and I have been researching the whereabouts of the children of one of the Coromantees? We think it very likely that they were shipped to Havana. I wondered—could the Anti-Slavery Society send someone there, to find and redeem them? I am sure it would be very good publicity, to reunite the children with their father."

Carsten swatted a mosquito. "The Society has discussed the possibility of redemption."

"And?"

"Decided against it. First, because our financial resources are limited. Second, because we fear that any concerted policy of that kind would just encourage the slavers to fetch more slaves so they could sell them to us for a quick profit. We would be, what's that American term, a 'revolving door.' Once naval resources can be spared to stop the slave trade at its source, and we have better funding, we may reconsider redemption."

"So what would you recommend?"

"Well—" Carsten was distracted by the appearance of the *Eikhoorn*, just coming around the upriver bend. It reminded him of the exciting day that they had seized the *Tritón*, and sunk its longboat, not many yards from where the *Eikhoorn* was plowing back downriver.

The longboat. He started cursing.

"Carsten, what's wrong?" asked Maria.

"We know from the reports that the Africans who have been causing trouble have weapons. I just figured out where they got them from." He pointed upriver.

"I don't understand . . . oh . . . the longboat? But wouldn't the weapons all be rusted?"

"By now they would be. But if they were found early enough, not irretrievably. The rust could have been scraped off."

"But how would they have known where to look? You don't suppose a colonist told them?"

"Perhaps. It might not have been evil in intent. A colonist might have bragged about the battle. Anyway, I will have the damn boat brought up. We'll take a count of how many bodies, guns and swords are still there, and that will let us make a good guess as to what was taken.

Carsten stood up. "The crew of the *Eikhoorn* is going to have to wait a little longer for their supper, I'm afraid. As for your problem, I think you are going to have to find a way for your Coromantee protégé to find the money himself. If he does, then the Society could perhaps find a trustworthy agent to send. A clergyman, perhaps."

* * *

The three Ndongo warriors, Mukala, Aka, and Miguel, studied the body of their fallen comrades. Both bore diagonal gashes on their foreheads, but their death wounds were elsewhere.

"Imbangala," Mukala said. The Imbangala were in the habit of distinctively marking their kills so that each warrior could claim the bodies of the enemies he had slain, have them carried back to the camp by his slaves, and then eat them with the proper formalities so that their ghosts couldn't haunt the slayer.

Miguel, pointed to the death wound. "That wasn't made by a spear."

"No," Mukala agreed. "It's a slash, not a thrust."

"And look how clean the edges are," said Aka. "That wasn't made with sharpened wood, or flint. It was a cut from a steel blade."

"This is very bad news," said Miguel. "The whites are arming the Imbangala with cutlasses. That is the only possible explanation."

"We should have wiped out the filthy Kasanje Imbangala right after we landed," said Mukala. "We had the advantage of numbers then." Many Ndongo, warriors and farmers alike, had been captured and shipped to the New World, to work Portuguese sugar plantations and Spanish silver mines. There were relatively few Imbangala on the slave ship because most were Portuguese allies. But Kasanje, who led one of the Imbangala bands, had set up an independent state in 1620, and so his people were fair game.

"That is easy to say now," reproved Aka. "But we were so thirsty we could barely move our limbs when we were freed." The slave ship had gone first to Angola, and tried its luck. It ventured further north, among the Coromantee, Eboe and Mandinka, only because it hadn't been able to fill its hold. So the Angolans had endured the privations of middle passage longer than any of their brothers in suffering.

Mukala made a gesture of propitiation to the gods. "Powers forbid we suffer so again!"

Miguel added thoughtfully, "If we had attacked the Imbangala immediately, the whites might have feared that we would attack them next, and turned their swivel guns on us."

"Do you think the Imbangala have guns, too?" asked Mukala. "If so, we are in big trouble."

"Don't know, but we better tell the elders what we found." Aka pointed at the bodies. "In the meantime let's rig a sled for these bodies. I'll not leave them for the Imbangala. And be quick about it; we don't know when they'll be back."

A few days later, the Ndongo moved their encampment some miles further east, away from the Gustavans and, they hoped, the Imbangala.

* * *

The Gustavans' spirits were lifted by the somewhat belated arrival of the four hundred ton, eighteen gun *Walvis*, their lifeline to the USE. It was commanded by Captain David Pieterszoon De Vries, President of the USE-chartered United Equatorial Company—their employer. It was accompanied by a *jacht*, the six gun *Siren*.

He brought news which was both welcome and unsettling. Welcome, in that peace had finally come to the Low Countries. Unsettling, in that there was now a Catholic King in the Netherlands, Don Fernando. The colonists, many of whom came from the Netherlands, were mostly Protestants, and therefore not inclined to trust the ex-Cardinal Infante's promise of religious tolerance—even if Fredrik Hendrik was now a "trusted advisor."

On a personal level, Maria was overjoyed when David brought word that her brother Adolph and his wife Catharina had survived the Spanish invasion. Her cup of happiness overflowed when David gave her a letter from Adolph.

This reaction was somewhat tempered once she had read the letter. Adolph was a professor of medicine, and the curator of the Leiden Botanical Gardens. Just as their father had been, before him.

He complained about the damage the Spanish troops had done to the garden. He complained that the students weren't paying attention in class. And he complained that the administration had unfairly reprimanded him for not showing more activity.

It was, he pointed out, all Maria's fault. He would have sent his *Catalogus plantarum* to Elzevier for publication two years ago if Maria hadn't sent him all those new plants from Grantville, thus throwing him off schedule. And then made matters worse by sending him exotic specimens from Suriname.

To add insult to injury, since she was gallivanting around the New World, without the slightest regard for her reputation (and for the damage she was doing, by association, to his dignity as a professor), that meant she wasn't back home drawing the plant illustrations for him.

At the end of this litany, he closed by hoping she was well.

Maria crumpled up the letter and tossed it into the Suriname River. "If it isn't one thing, it's a brother," she announced.

* * *

David digested the news without any more change of expression than an up-timer might have seen on the faces carved upon Mount Rushmore. But he knew that the Imbangala couldn't be allowed to get away

with killing colonists, even ones who foolishly ventured into their territory.

"All right, this is what we'll do. First, we need to fortify the town and Fort Lincoln. Fortunately, I brought cement, and instructions on how to use it to make concrete. Concrete is stronger than wood, and doesn't need to be carved like stone. Besides cement, we need sand, gravel and water, but I believe this country has those materials in abundance.

"I also have the materials for a proper gatehouse, that is, I brought a portcullis and the like. And I have cannon in ballast. They are *pedreros* that were being sold off and replaced by newer designs, but they should be fine for fighting these Imbangala.

"We will need the Africans or the Indians, or both, for fighting in the forests. While the colonists are seeing to the defenses, we will send out emissaries. Heyndrick and Maria, you'll take the *Eikhoorn* up river to talk to the Coromantee. And see if Captain Marshall, or his Indians, are willing to offer any assistance.

"Henrique and Mauricio, you'll go to the Mandinka and the Eboes."

"The Ndongo are much more numerous, and they are already at war with the Imbangala," interjected Mauricio. "Wouldn't I be more use talking to them?"

"Perhaps, but we know that they are also more hostile to Europeans, thanks to what the Portuguese have been doing in Luanda the last hundred years. I can speak Portuguese—I was Jan Pieterszoon Coen's right hand man in Asia. But I can tell them honestly that I am Dutch, and the Portuguese are my enemies. Present company excepted, of course.

"Also, we hear that they've moved pretty far to the east. We'll need a big ship like the *Walvis* to force its way back to windward, find them, and move them some place more useful. And I'd be needed to skipper the *Walvis* in any event.

"Coqui will come with me, to talk to the local Indians. And also—what's her name?"

"Tetube?"

"Right. The lass who witnessed Imbangala atrocities first hand. Anyway, we'll organize a Grand Alliance, and put down the Imbangala for good."

* * *

"He's coming, he's coming!" the Mandinka children shrieked, running up the path to their village.

"Who's coming, children?" said the adult on guard duty.

"He Who Talks!"

The Mandinka had quickly realized that Mauricio was one of the select few who had more than the usual mortal allotment of *nyamo*, the secret energy that allowed one to practice sorcery. It was held by great hunters, skilled blacksmiths, *gree gree* men, and of course the *nyancho*, the hereditary warrior aristocracy from whom they drew their rulers.

Had not Mauricio presided over the ceremony in which their shackles were removed? No doubt his

nyamo had subdued the cruel whites who had crewed the slave ship, forcing them to yield up the key and accept the loss of their property.

When they learned that Mauricio spoke the languages of all the Europeans, and seemingly all the Africans, that was further proof of his power. The Mandinka did argue as to whether this was a natural, spontaneous manifestation of his *nyamo*, or whether he actually cast a spell when he wanted to learn a new language. But either way, he was a man to be respected, even feared.

Henrique, watching the fuss made over Mauricio, was privately amused. He knew of the epithet, "He Who Talks," which had been given to Mauricio, and had told Maria that once the Africans knew Mauricio better, they would no doubt change it to "He Who Talks Too Much."

But for the moment, it worked to the Gustavans' advantage. Henrique and Mauricio were ceremoniously ushered into the hut of Faye, the leader of the Mandinka.

* * *

"So," concluded Heyndrick, "the people who freed you now call upon you to fight with them against the Imbangala threat."

The reaction of the Coromantee miners wasn't quite what he had hoped for.

"What's in it for us?" asked Antoa.

"That's right," said Owusu. "We're here on the west side of the river, and the Imbangala are on the east. Let the Imbangala and the Ndonggo kill each other."

Heyndrick tugged nervously at his earlobe. "Mauricio tells me that the Imbangala have crossed rivers before."

Antoa shrugged. "They're afraid of your ships with the cannon, so they aren't going to cross."

"Perhaps not this month, or next, but they will cross once they have enough numbers. If only to get at our goods," Heyndrick warned.

"The good whites are helping me find my children," interjected Kujo. Heyndrick gave him a quick smile of thanks.

"Fine, when they bring the children to you, we can talk again," said Antoa.

Maria whispered to Heyndrick.

"Let us talk more after dinner," Heyndrick declared.

* * *

"That didn't go quite as well as I had hoped," Heyndrick muttered. "What makes you think that they will be more receptive after dinner?"

"Actually, it's tomorrow morning that they will be more receptive. So don't press too hard after dinner."

"I would think that tonight, when they're drunk, they'll feel more martial than tomorrow morning, when they're all nursing hangovers."

"Trust me, I know the Coromantees. And now you must excuse me." Maria rose.

"Where are you going?"

"I must be polite and help the Coromantee womenfolk prepare dinner."

* * *

Heyndrick followed Maria's advice. The next morning, Owusu and Antoa were the first to lay their spears at Heyndrick's feet.

Heyndrick was dumbfounded. *What had happened?*

Maria gave him a nudge. "Uh, thank you," said Heyndrick. "Take up your weapons, warriors." He raised his pistol. "Victory!"

They brandished their spears. "Victory!"

* * *

"What just happened there?" asked Heyndrick, as the *Eikhoorn* made its way upstream toward the Marshall's Creek settlement.

"I had a word with the womenfolk, as I told you. And they made it clear to our valiant warriors that if they didn't go off to war, the ladies would make them *wish they were already dead.*"

* * *

The crew of the *Walvis* ' pinnace pulled at the oars. They picked their way through the mangroves, and stared into the verdant growth of the Suriname coast. Now and then the leaves were disturbed as a bird landed or took flight, but they saw no sign of the presence of man.

David de Vries, sitting beside the helmsman, wondered just how, exactly, he was going to find the Ndongo, let alone bring them into the alliance.

Coqui stood at the prow, and occasionally gestured to turn one way or another. David hoped that he, or the local Indian woman, Tetube, who sat behind him, had some idea of where to look.

Eventually, they beached the boat, and left a couple of guards behind. The rest followed Coqui and Tetube, who led them to a trail. Tetube, it seemed, knew of a friendly Indian village in the area.

Friendly to her tribe, at least.

But there wasn't cause to worry. The Indians were indeed friendly. And while they had no contact with the Ndongo, they knew another tribe which traded with them. David distributed a few presents, and acquired a new guide, who went back to the pinnace with them and directed them to the mouth of a nearby creek. Not far up it, they encountered a Ndongo fisherman.

When he spotted them, he immediately sat down and reached for a paddle. Clearly, his trust in the good intentions of a party of white men, even here in Suriname rather than in Africa, was minimal. However, after a moment he obviously decided that there was no way he could outpaddle the crew of the pinnace, even for the moments needed to reach the bank and disappear into the forest. He set down the paddle and slumped, head bowed.

David identified himself as the "Father" of the Gustavans. The fisherman recognized the name of the colony, and this seemed to soften his attitude toward them. At least fractionally. David rummaged in a chest and produced a metal fishhook, which he presented to their new acquaintance. That finally loosened the fisherman's tongue.

He told David that if he brought the visitors to the village unannounced, his people would assume he was acting under duress. He asked David to let him leave bring word of David's arrival to the villagers, and assured him that he would receive a proper welcome if he did this.

After a moment, David agreed. Although not without some anxiety as to what, precisely, was the Ndongo concept of a "proper welcome" for white men.

The fisherman headed upriver, and, once he was out of sight, David had Coqui and the other Indians in the party climb trees on either side of the creek, to warn David if the approaching party appeared to be hostile.

Perhaps an hour later, several dugout canoes came down the river. The first canoe had just a few men in it, unarmed. Behind them, but obviously holding back, were two more canoes, both carrying bowmen and spearmen. Clearly, the Ndongo were ready to either parley or fight, as the situation dictated.

David, an experienced explorer, managed to persuade the Ndongo of his good intentions, and the Ndongo invited the Gustavan party to follow them back to their settlement.

The Ndongo, of course, didn't need to be convinced to fight the Imbangala. Their concerns were over how did the Imbangala get European arms and was David willing to supply their equivalent to the Ndongo.

David explained Carsten's theory as to the Imbangala windfall, and assured the Ndongo that the Gustavans would give them weapons, provided they came back with him to his ship.

"No, not your ship," they cried. "You might be trying to put us back in shackles. "

David told them that they didn't have to come on board, they would be given the arms on the beach. But the arms could only be handed over where the crew of his ship could see the interchange and see that the Ndongo weren't up to any tricks.

The Ndongo saw the sense of this and agreed.

They came to the beach and admired their new cutlasses. "Guns?" one of them asked hopefully.

"Some other time, perhaps," said David.

Beginning of Long Dry Season (August to November, 1635)

With the Gustavans' support, the friendly African and Indian tribes built up their defenses, and set up patrols, curtailing the expansion of the Imbangala. But it was all a big distraction from more productive activities, and it wasn't long before the allies were debating how to bring the Imbangala to a decisive battle. Especially now that the rains had stopped, and it was easier and safer for the Europeans to enter the forest.

David summoned a grand council of the score or so of tribal leaders, African and Indian, large tribes and small ones.

"Can your scouts locate the Imbangala encampment?" David asked the Ndonggo leader, Lucala.

"Perhaps. But destroying the camp does not defeat the Imbangala. They are not a settled people, they are a mercenary troop. We would, at best, deprive them of their slaves and their women, and perhaps the children they are training for war. "

Faye, leader of the Mandinka stood up. "A thousand pardons for the interruption. But rather than search for the jungle for these pestilent Imbangala, why not bait them into a trap?"

"What kind of bait? And what kind of trap?"

* * *

Borguri trembled with rage. "Who has seen this, besides you?" he asked the warrior.

"Just a slave, oh great and wise leader."

"Kill him."

Borguri tore down the sign, and mutilated it with his sword. He then got out his tinder and flint, made a fire, and burnt it. Finally, he collected the ashes and tossed them into the nearby stream.

* * *

The next day, a second sign was found. Like the first, it featured a caricature of Borguri, wearing woman's clothes, and surrounded by various Ndonggo symbols of ridicule. Maria was good at drawing things other than plants and animals. And her Ndonggo informants had thought instructing her to be great fun.

A necessary skill for drawing wild animals, especially those of the rain forest, was the ability to draw from memory, from a fleeting glance. Maria had remembered Borguri from the deck of the slave ship—despite the ravages of thirst and imprisonment, he was formidable, and received deference from the other Imbangala—and, when the Ndonggo described Borguri to her, she realized who they were referring to, and could draw him. Especially with the Ndonggo by her side as she drew, quick to point out errors to her.

This sign was seen by a large party of warriors and slaves. Borguri had it chopped to pieces, and burnt, and then he peed on it. He then ordered an immediate raid on the nearest African village, and the sacrifice of six slaves to achieve success.

They arrived at the village only to find that it had been deserted, with all the inhabitants and their moveable possessions gone, and the crops destroyed. They did leave behind a lot of signs, however.

Borguri had to kill one of his warriors that night, who, in his cups, made derogatory remarks about Borguri's leadership. It was clear that Borguri had to take quick action, but it wasn't so clear what his target should be. The source of the signs was clearly Gustavus, but Borguri knew that a direct attack on Gustavus, or on Fort Lincoln, would be suicidal.

The answer came a few days later, from one of his spies. This fellow prudently remained in his dugout canoe as he conveyed his news. A few miles east of Fort Lincoln, in the strip of land between the Great Sea and the Cottica River, a fetish hut had been built, at a site which the European and African sorcerers deemed propitious for that purpose. Inside the hut, there was a wood statue of Borguri, surrounded by curse objects and more of the insulting signs. In exactly a week's time, there would be a ceremony at which the statue would be burnt, in a ritual which would assure the ignominious defeat of Borguri and the Imbangala.

Borguri asked him more questions, assuring himself that the fetish hut was out of cannon range of Fort Lincoln. Then he gave his orders.

Wait. Was that a smirk he saw on the face of his spy? He grabbed a spear and threw it.

The insufficiently prudent agent toppled into the water.

* * *

The Imbangala and their Indian allies crossed the Cottica river in a swarm of dugout canoes. Borguri left behind the children trainees, with a few wounded regulars to supervise them, as a rear guard.

Borguri led the rest of his war party in the direction of the reported fetish hut. His Caribs scouted ahead and to the flanks, watching for an ambush. They found no one.

At last, the war party entered the clearing which held the fetish hut. They milled about it, singing war songs and building up their courage. At last, one of the Imbangala strode into the hut, and triumphantly grabbed the infamous statue.

His triumph didn't last long. With the statue dislodged, a spring-loaded pan rose. Inside the pedestal, a concealed trigger mechanism, protected from the tropical damp by rubber and tar, struck a spark, igniting priming powder inside. This lit a safety fuse, which in turn set off the barrels of gunpowder arrayed beneath the floor of the hut. The wood planks fractured, and the shards hurtled upward.

The bold Imbangala, still peering curiously at the statue in his hand, was impaled. So, too, were several of his companions. Others simply fell into the pit.

Borguri wasn't one of the victims of the trap. He immediately ordered the Imbangala back to the boats (and didn't trouble himself as to whether his Indian allies were doing the same). They got there, only to discover that their escape had been cut off. The river Cottica was narrow, but very deep. Deep enough so that a ship of force could sail a hundred miles upriver, if it wanted to.

The fluyt *Walvis*, the captured caravel *Vreedom* and the *jachtEikhoorn* were already patrolling the river, and firing their cannon and swivel guns at any likely targets.

Borguri briefly considered attacking the ships. It was true that his warriors only had to cross some fifty feet of water, from the north bank of the Cottica to the sides of the ships, to attack them, but the high tumblehome hulls of the *Walvis* and *Vreedom* would be difficult to assault from the low-slung canoes. The *Eikhoorn* was a more manageable target, but it, like the larger ships, had boarding nets out. For that matter, their decks were packed with Coromantee, Eboe, Mandinka and Arawak warriors, and there were musketeers in the rigging.

Where are the Ndongo? he wondered.

He got his answer. The Atlantic Ocean, the Paramaribo River, and the Cottica River formed a horizontally stretched C, facing east. The Ndongo had been hidden, screened by friendly Indians, far enough to the east to escape detection by the Imbangala's scouts. Once the Imbangala attacked the fetish hut, they surged westward, driving the Imbangala against the reinforced defenses of Fort Lincoln at the confluence of the Paramaribo and the Cottica.

Borguri was one of the last to fall. He had his back to a great tree trunk, and several Ndongo approached him. Borguri dared them to pick a champion to fight him, one on one. The Ndongo backed off slightly, and heatedly argued whether this challenge should be accepted and, if so, which had them had precedence.

At last Faye arrived, a Dutch cutlass in hand. "What is the problem here?" They explained.

"Young idiots," he muttered. They stiffened.

"Bowmen!"

At that, Borguri charged. To no avail. The Ndongo danced back, taunting him and pricking him with their spears, and first one arrow and then another plunged into his body.

Borguri sank to the ground. Faye moved forward, and swung his cutlass, finishing him off. "This is real life, not a song," he admonished the spearmen. "Defeat your enemy at the least cost to yourself." He made a final sweep, beheading Borguri.

Akan village, Paranam

"Kojo, months ago, we spoke of what must be done to recover your children."

"I remember, Maria. At home, I had gold. I was an *obirempon*, a holder of an elephant's tail." It was the Akan way of saying that he was a gold mining tycoon. "Here, I am but a leaf in the forest. How will I ever be able to buy back my children?"



"There is a way of getting gold from streams, rather than by digging holes in the ground. My friend from America, Lolly, calls it 'panning.' You take a shallow dish—"

"You need not explain this 'panning,' Maria. All the women and children of the Asante know how to gather the flecks of gold which the River God has scattered amidst the gravel."

"And do you know how to do this?"

"Of course. I was a child once. And I watched my wife teach our children, and saw my Mansa find her first nugget."

"Well, I wish I could just give you the gold you need, but I can't. But I have consulted our oracles"—that was how the Africans interpreted her references to encyclopedia articles—"and learned that there is river gold in this land." She started drawing in the sand. "This is our river, the Suriname. " She added two more sinuous curves. "And the Saramacca to our west, and the Marowijne to the east.

"Upriver, the Marowijne forks like so." She drew in the Tapanahoni and the Lawa, and then added an "X" at the location of the up-time town of Cottica. She twirled her finger around it. "Here, somewhere, there is gold."

Maria then swept her hand over the upper Suriname and Saramacca. "Here, too, but I can't be more specific."

"How do I get to these places? How long is the journey? How friendly are the Indians?"

"You will need to go by canoe. Tetube said that she can guide you. And Coqui said he will go, too, he is bored." Maria suspected that Coqui's offer had less to do with boredom than with the chance to get to know Tetube better.

"We Akan usually don't mine gold alone. It's most often a family enterprise. I will see if any of my people want to come along."

Maria grimaced. "I must ask you not to. I want this kept a secret. I don't want all the Gustavans running off to look for gold when they should be farming to keep themselves fed."

He cocked his head. "Then aren't you worried about what will happen if I come back with gold?"

"A little. But I thought I could cover it up. Henrique is an honest man, and knows how to keep a secret. He goes to Havana, he finds and buys your children, and comes back here with them. All the Spanish need know is that he has gold, not how he got it."

Fort Lincoln, Suriname

"Getting the colonists to follow orders without griping was hard enough. But if every plan you make has to be presented to every kinglet in this Little Africa you have created, in some kind of grand palaver, you will go insane before the rains return," said David.

"What do you suggest I do?" asked Carsten.

"Get the chiefs together and tell them that you want them to meet and pick a paramount chief. Someone to represent them on all save the most important matters."

"Right, I'll do that."

* * *

The chiefs had been huddled in the great ceremonial hut for twelve hours straight. Carsten had told them a few hours earlier that none of them would be leaving it until they picked the chief of chiefs.

Now and then, Mauricio was called in to clarify some point or other that they were arguing about. No one wanted an error in translation to get a blood feud started. Finally, after a long waiting period, he decided to snatch some sleep while he could.

Perhaps an hour later, the curtain which had been hung over the hut opening to keep mosquitoes out was pushed back once again, and Faye stuck his head out. "Mauricio, please," he said.

Carsten sighed. "Mauricio!" he called.

"He's asleep," said Henrique.

"Well, wake him up. We want them to finish one of these days."

Still rubbing his eyes, Mauricio arrived, and entered the hut.

He emerged a few minutes later, looking wide awake, even a little wild-eyed.

"Well? Have they picked a paramount chief, yet?"

"Yes," said Mauricio. "For the love of God . . . Me."

Maria gave a whoop. "All Hail Mauricio, King of the Jungle!"

* * *

NONFICTION:

Home On the Grange

Written by Kevin H. Evans



Take Europe . . .

The state of agriculture in the 1600s is unique. Nothing approaching the modern standardization of methods existed. One can find farming practices ranging from the ancient to the modern. This is mostly because of the large number of diverse political systems in existence, with the result that agriculture was not practiced in quite the same way anywhere in Europe.

In the seventeenth-century we have a fairly interesting problem. Really phenomenal things were going on, chief among them the Reformation. Also we have competition between different groups of nobility over the control of Europe. This competition not only existed between nation states but also between family members who are the leaders of these various nation states. All of this offers a great deal of information available on the really interesting political and socio-economic stuff, but it buries information about the more prosaic activities of the time.

This is a lot like trying to find a bread recipe from the Middle Ages. Because everybody knew how to make bread, nobody thought it was important to write down just exactly how bread was really made. So modern scholars have to make educated guesses based on secondary material.

Much like baking, farming can be classed as a prosaic activity. A lot of data about farming is not available without the type of research archaeologists do when they extrapolate records, recreate sites, and experiment on differing techniques. As a result, information about how farming was accomplished at this time has to be ferreted out from the data available. Close study of articles, paintings, journals, tax reports, land records, archaeological information, and family histories must be made in order to recreate just how people were going about gaining products from the land.



As far as I can tell, almost every system of farming that had been developed throughout history was still in use in one form or another in seventeenth-century Germany. Evidence exists that everything from large estates worked by serfs, individual family farms, collective corporate villages, command-driven tenant farmers, to monastic orders was in use in the 1630s.

The type of agricultural production used at any farm was largely a function of the political leadership and tradition of a given area. Adding more confusion were the enormous entanglements in regard to land ownership. It was not uncommon for land to be owned by one person, managed by another person, rented by a third person, and farmed by a fourth. Added into this mess of ownership were various feudal and religious duties that were owed by the various numbers of people somehow related to a particular parcel of land. As a result, almost anything we can imagine existed somewhere in one form or another.

Slightly off topic, but this mishmash of ownership and entailment is what drove my family to immigrate to the United States in the 1800s. Basically they just wanted to own their own land without strings from anyone else.

* * *

According to canon, the area immediately around Grantville has the majority of the farmers living in small villages, usually of six to twelve extended families who rent their land and pay the rent mostly in goods and services. Lease durations were usually ninety-nine years or three generations, whichever was shorter. New leases were arranged between owners, tenants, and prospective buyers, normally with professional legal help.

The techniques used in this area of Europe are not as primitive as they could be, but there would be a lot of room for improvement, especially with the advances in hybrid strains, new farm equipment, and methods of enriching the soil that have been developed in the last one hundred years of our time line.

Also, I infer from my research that the local farmers are intensely interested in improving the production of their land. This interest is generated by the fact that farmers tend to benefit directly from increases in their production.

* * *

Historically, the Patrons of Husbandry (the Grange) promoted organized buying and selling by the farming community, as well as the development of new and more effective farming techniques and processes. The combination of a Grange organization and a county agent-style Agricultural Information Office could greatly speed the spreading of new agricultural techniques and information throughout the farming population. This new organization, in combination with other organizations like the Committees of Correspondence, will be a powerful tool in the effort to shape public opinion and provide higher standards of living throughout the entire population.

So the question becomes: "How will the Grange organization affect society in 1632?"

Add in the Grange . . .

In the United States, the Grange is a long-term, stable organization of individuals concerned with farming and production of agricultural products. In actuality the term "Grange" is modern shorthand for the actual name of the organization, which is:

The Order of Patrons of Husbandry, the National Grange.

This organization was formed shortly after the American Civil War in order to enable farmers to organize as a group. Their goal was to improve prices and working conditions on their farms. While not specifically started as a labor organization, the effect of the Grange was that the organization led to the virtual elimination of buying from middlemen, improved farming techniques, and coordinated marketing in order to obtain the best prices for their products.



Founded in 1866 by Oliver Hudson Kelley and several others, the Grange was formed as a fraternal organization. The majority of the seven founders of the order were also members of the Masonic Order. Perhaps because of this, the Grange developed as a formal, fraternal, ritualistic organization. It was

formed into a society with degrees and rituals denoting a member's position within the group.

Key among the founding principles, was that the Grange was an organization for both men and women, and men and women enjoyed equal status within the organization. Another precept was that while the organization was Christian, it was not sectarian and was very egalitarian in its approach. They very clearly supported farmers without respect to sex, age, religion or race.

In 1874 at a national meeting of the Grange, a declaration of purposes for the National Grange was created. Chief among these were two general objects:

1. United by the strong and faithful tie of Agriculture, and the usual result to labor for the good of our order, our country, and mankind.
2. We heartily endorse the motto: "In Essentials, Unity; in Nonessentials, Liberty; in all things, Charity."

Another significant attribute of most Grange organizations was the existence of the Grange Hall, commonly called "The Grange." This was where meetings and activities took place. A manual, titled *Manual of Subordinate Granges of the Patrons of Husbandry*, was published in 1878 wherein all the activities of the Grange were detailed. The basic forms and purposes of meetings were set forth in this manual.

The organization is administrated as follows: on the local level, you have what are called Subordinate Granges. On the county level, Subordinate Granges are organized into groups called Pomona Granges. The Pomona Granges are collected into the organization called the National Grange. An interesting side note is that a Pomona Grange did not refer to one specific Grange, but was a general title given to any Grange that governed a county size area and had Subordinate Granges reporting to it. It seems that the founders of the Patrons of Husbandry did not want to say County Grange as it reflected ties to a royal system not in favor.

Enter Grantville . . .

Into the mix in 1600s Europe, we drop our Americans. Grantville brings with it an enormous amount of wealth and prosperity, at least within the limits of the town itself. One of the big problems for the up-timers is to reduce the resentment and jealousy of the surrounding countryside in regards to this apparent wealth and prosperity.

Also, the new government, created for the up-timers by the up-timers, is intensely interested in avoiding the appearance of being an elitist group. Therefore, one of the most important priorities of the new government is to spread wealth, prosperity and technological information throughout the down-time population.



Among the many possible means of sharing and teaching, the Grange can be one of the most effective. When most people think of the Grange, they think of the Co-Op common in the western United States. Such cooperative organizations provide farming families and villages with the ability to make major purchases, such as large agricultural equipment, and share the use of that equipment.

There is however, a small problem. There is no Grange organization either in Grantville, or our prototype town of Mannington, West Virginia. This means that the establishment of the Patrons of Husbandry will have to start from scratch.

Fortunately for Grantville, Willie Ray Hudson is an old-time farmer and associate with the Grange system in West Virginia. His library likely includes several documents, including the 1878 Grange manual, and the declaration of purpose formulated the same year by the National Grange of the Patrons of Husbandry. This information will be extremely useful in the creation of a Grange organization down-time.

And we get . . .

Because it is desirable for the Grange organization to expand rapidly throughout Europe, the organization will probably be formed as a fraternal organization with an open meeting policy. This means that the rituals and ceremonies of the organization will not be held in close secret. Voting for leadership will be in an open meeting which nonmembers of the Grange are allowed to attend.

In the book *1632*, at one of the earliest organizational meetings held in Grantville, the desirability of Grange as was pointed out to the emergency committee. From that moment, Willie Ray Hudson became the first of the point men in its establishment.

Willie Ray, presumably, was a member-at-large of the West Virginia Grange. And being such a member, he should be assumed to have many of the materials and resources that the Patrons of Husbandry provide to their membership.

Perhaps the most useful of this information, will be the 1878 Grange manual, and the *National Declaration of Purpose*. The principles and concepts set forth in these two pamphlets will be immediately useful and comprehensible to the agricultural community in 1632. My speculation is that the first action of Willie Ray Hudson and his assistants will be to translate and print numerous copies of these two documents.

As we've seen in other stories from the early years after the Ring of Fire, cooperation between local farmers and up-time farmers happens almost from the very beginning. A fraternal organization of farmers

should appeal greatly to the farmers surrounding the Ring of Fire. Again this is my speculation, but I surmise that the first Grange founded will be the local Grantville Grange, and that it will include Grantville and the surrounding villages within half a day's easy travel.

This Grange will have the distinction of being the first Grange, but probably will not end up as being the National Grange for the USE. The National Grange will eventually be set up as the overall coordination and scheduling office and be located in the capital.

I further expect that the Grange will spread almost organically. Villages neighboring the established Granges will rapidly see the advantages of the organization and desire to have such an organization for themselves.

The biggest single expense in spreading the Grange will be the cost of printing the requisite pamphlets for the organization and operation of the Grange. And in all probability, the cost for these will be handled as each local Grange chooses.

Another thing to be remembered is that Granges will not be established with a locked-in hierarchy of organizations. Each subordinate Grange will have close ties with the Pomona Grange established to coordinate their area, but with the exception of something along the lines of a credentialing committee, there will be very little in the way of direct control by the National Grange over the subordinate Granges.

The financing of the Pomona and National Grange will probably be along the lines of donations from the subordinate Grange. A formalized set of membership fees or assessments will probably not come into existence. By the very nature of the agricultural community and the large area that will be covered, such subscription and membership fees would be at best difficult to collect, and at worst cause animosity.



The concept of unity of purpose and strength in numbers will appeal to the agricultural population, and the benefits provided by organization will become rapidly obvious. Such an organization will provide each village Grange with the ability to bargain collectively for buying and selling, and groups of villages within their various Granges will form organizations to buy even larger sets of equipment or gain better prices. It should be noted that the type of villages close to Grantville tended to be cooperative even before the Ring of Fire, so the cooperation among all levels of the Grange will seem to be a natural extension of what they already do. All of this could well provide a higher standard of living for participants in the Grange system.

Another effect will be that the typical farmer will gain a larger voice in the political system. Local Granges can express their concerns to the Pomona Granges who can forward those concerns to the National Grange which can then present the concerns of the membership to the government. Historically, the

Grange organization has not been partisan but has promoted the interests of the agricultural community to the government at large.

Because the agricultural community will see that organizing into a Grange is desirable, it is possible that some of the political organizations in Europe will seek to suppress the Grange. Many of the political systems that currently exist down-time will see the Granges as inconvenient. Some will see the Grange organization as a direct threat to their existence. And a few of the governments in down-time Europe will see the Grange organization as an opportunity to solve immense problems in feeding the population.

It should also be noted that just because the Grange concept came from an up-time source, does not mean that the Grange organizations will always be in agreement with the government formed around the USE. The agricultural population, especially as personified by the Grange organizations, could be in frequent conflict with the policies and purposes of the government. Conflict could also arise in regard to large business organizations like the railroads and the heavy industries that are coming into existence.

In a nutshell, the Grange organization formed around the principles of the Patrons of Husbandry will provide rapid dissemination of agricultural knowledge, organization for agricultural commerce, and will empower the people working the land. We should also remember that just because the concept of the Grange came from an up-time source, this does not automatically place all the Granges in agreement with the up-timers.

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Hyperinflation: Who Is Going To Do It?

Written by Gorg Huff



The 16th century was a period of massive inflation. European silver production increased as gold and silver came from the Americas. The growing importance of credit transactions plus population growth and the expansion of European economies and trade were all factors. In the Danube region the price of grain increased 170%; meat prices soared by 110%. Wages did not keep up with the precipitous rise in agricultural prices: A Viennese bricklayer's apprentice had received daily wages equivalent to eight pounds of beef in 1500; in 1600 his daily earnings netted him only five pounds of beef.

At the beginning of the 17th century, inflation accelerated, finally leading to a bout of hyperinflation known as "Kipper und Wipperzeit" in 1621–22. It should be noted that coin scales to check the Wippen were illegal. You weren't supposed to check the weight of the coins.

Timeline of events in a bit more detail:

1559—The Augsburg Imperial mint ordinance of the Holy Roman Empire was implemented. Per this ordinance, only a selected group of princes had the right to mint. Mints could not be sold. Export of coins and silver was prohibited and import of foreign coins limited. The metal content of coins was set and debasement punishable by death. Standardized denominations such as 9.5 gulden to the mark were defined. Bimetallic standard largest coins were gold; all others silver. Except it didn't work. People started breaking the rules before the ink was dry, starting with the lowest denomination coins where the cost of minting was greatest for a given amount of silver.

1576—Spain declares bankruptcy

1582—1 reichstaller = 68 kreuzer

1587—Venetian *Banko della Piazza di Realto* founded in response to the bankruptcy of the private deposit banks.

1596—Spain declares bankruptcy

1607—Spain declares bankruptcy

1609—1 reichstaller = 84 kreuzer

1609—Amsterdam Deposit Bank founded. Coins could be deposited and the respective amount would be credited in bank money. The quality of the coins would be assayed at the time of deposit. Bank money could be transferred to someone else's account by assignment, avoiding the cost and pain of transferring the coins directly.

1614—Lending bank established in Amsterdam, to make loans to the government and against collateral, mostly coins and bullion. This led to the creation of money through writing of bills of exchange. Any account holder could write bills in terms of bank money. In effect, the two banks together become a fractional reserve bank without being thought of as one.

1617—Duke of Braunschweig-Wolfenbuttel ordered the coining of 210 groschen from one mark of silver compared to 110 required by the ordinance.

1616—Middelburg Deposit bank founded.

1619—Hamburg deposit bank founded.

1621—330 groschen to the mark. 46 gulden to the mark

1621—*Nuernburg Banko Publico* founded. Note: the *Nuernburg Banko Publico* never did all that well because its bank money wasn't a consistent amount of silver and because it started loaning money to the government of Nuernburg from the get go.



1622—Hans de Witte, Albrecht von Wallenstein and Karl von Liechtenstein lease all mints in Bohemia, Moravia and Lower Austria from Ferdinand II and are granted a monopoly for silver purchases and coin production in those areas. Silver was to be minted at 79 gulden per mark. But they diluted it even more. Ferdinand II got six million gulden from the lease. The value of the thaler rose from an original equivalent of 1 gulden, 8 kreuzer to 11 gulden, 15 kreuzer. Yet that change could not have been because of an overwhelming increase in the money supply simply because they could not melt and remint all the coins in the Holy Roman Empire in the space of a couple of years. There would be coins of varying silver content from older mintings. How many coins could they manage to mint in just under two years when they had to buy the silver? Assume that they mint 90 gulden to the mark and assume that they managed to mint

coins equal to twenty percent of those already in circulation. The total increase in the money supply is somewhere between ten and fifteen percent. That's not hyperinflation territory if you're dealing with credit money.

1623—Near the end of the year Ferdinand II decreed the withdrawal and exchange of the kipper money. 100 thaler of kipper coins were exchanged for only 13.3 thaler imperial coins—an 87% loss of value tantamount to national bankruptcy. Note that the people who had been stuck with the kipper coins took the loss, not Ferdinand II.

1624—Most of the exchange of Kipper and Wipper money for new imperial coins. Legal copper coins were first minted in Sweden.

1627—The Castilian economy collapsed. The Spanish had been debasing their currency to pay for the war in the Netherlands and prices exploded in Spain.

At the same time, the average German peasant saw cash money only occasionally for most of the sixteenth and seventeenth centuries. Per Govind P. Sreenivasan's *The Peasants of Ottobeuren, 1487-1726*, they used "money" but not cash. As in: Hans has a debt of 4 Guilders on which he pays two and one half Guilders by taking five horses to market. There are lots of examples that indicate that though actual coins were occasionally used, more often than not it was small-scale money of account, because neither side of the deal actually had any coins. It was debt money, full faith and credit money, but not issued by the government. It was issued by the borrower when he promised to pay later for something that he needed and accepted by the lender he was getting the goods from.

In today's world there are tight-money economies, and cash-strapped economies, but the situation in early-seventeenth century went beyond that . . . to the border of a barter economy. At least for the poor and up to the lower middle class.

This way of doing things compensated some for the lack of money. However, it had its drawbacks. It meant that people were tied into a market where they were known. Their credit wasn't, for the most part, portable. They couldn't go after a better job because they didn't have a reputation in the next town and they had no money to get them by till they got established.

So, how can you have hyperinflation when there isn't enough money to support the economy? Simple: base your money on a commodity, in this case silver, then don't put the full amount of silver in the coins. Credit money and commodity can coexist and trade one against the other, but they don't mix well. You can't have a solid currency that is part one and part the other. If you try, the lack of the commodity in your coins causes the value of the coins to drop. Or, if the commodity price goes up, people start buying your coins for the commodity and taking them out of circulation.

That was the general state of affairs in Europe when the Ring of Fire happened in 1631. The Ring of Fire brought with it some—but by no means all—of the knowledge of economic theory that had been accumulating over the ensuing centuries. Spain's economy was in collapse; Germany's was worse; France's was held together by the power of the central government. The economic bright spots were the United Netherlands and Venice.

People were making do, making their own money, simply by deciding it was there. By accepting each other's promise to pay them later and then accepting goods and services for the debt owed.

After the Ring of Fire

The Ring of Fire happens and things start to diverge. What follows is deduction combined with canon from the books and stories in the 1632 series.

There is going to be pressure on the Finance Subcommittee from the beginning to introduce silver coinage. The Finance Subcommittee will fight the pressure as long as it can, but may be forced to a compromise. The compromise is the issuing of silver coins that are not American dollars or any multiple of dollars. It won't be a silver dollar or a silver ten-dollar coin or twenty-dollar coin. If anyone tries to call it a dollar, Coleman Walker will have a conniption fit and so will the rest of the Finance Subcommittee. An Amsterdam bank money gulden represents a bit over three-quarters of a troy ounce of silver in a vault in Amsterdam. 24.616 grams or 0.791 troy ounces. So, sterling silver is going to start trading in the Grantville exchange at about \$250.00 a troy ounce. By the time that the Dutch gulden is down to \$42 to the dollar, sterling silver is trading at around \$53 dollars an ounce. The Pfennig, which is generally the smallest denomination available before the Ring of Fire, starts at about \$7.50 and ends up around \$1.50. Even a brass farthing in England starts out at \$3.12 and is still worth \$0.66 when the American dollar reaches \$42 to the guilder.

There is a transaction cost in having a currency that is hard to subdivide below the dollar level. It's not just that little Penny can't save her pennies and little Hans isn't going to get his hands on any hard money no matter how many chores he does. Little Hans' mom is affected when she goes to the bakery for the family's daily bread as well. The baker can charge one pfennig for a loaf of bread or he can charge two. He can adjust the size of the loaf a bit if the price of flour changes, but he can't drop his price nor raise it in small increments. So the family ends up with extra three-day-old bread but can't put aside a little at a time to buy a new cheese grater. Not having currency in smaller than dollar amounts limits competition because the baker down the way can't lower his prices.

One of the hidden benefits of the introduction of the American dollar will be the ability to make incremental price adjustments. The baker can offer the widow Schmidt a three-quarter size loaf for less than the full-size loaf, since she has only little Hans to feed and a full-size loaf would get moldy before it got eaten. And if the first baker won't do that, well, the one down the lane will and get more customers for his trouble. This hidden benefit will show up gradually as increased production and sales of low cost items and in minor price adjustments on larger purchases. This will be followed by a gradual decrease in the "in kind" arrangements that were so prevalent.

The acceptance of paper money that isn't based on silver isn't that much of a stretch, not for a farmer who has been trading his labor for goods and services based on the local merchants' account books. It takes a bit of explaining and a bit of salesmanship. Some of the farmers need some silver, enough to pay off debts, or at least pay them down. So, just at first, there is quite a silver crunch. The Roth's stock of precious metals is vitally important in the first couple of months. So is the silver that Captain Mackay deposits in the first national Bank of Grantville. And while a couple of trunks full of silver may not seem like that much to run an economy on, the local economy has been running on not much more. What it hasn't been doing—couldn't do—was be flexible enough to expand.

With the small denomination coins being the ones that have been most adulterated during Kipper and Wipper and time leading up to it, there are a lot of small denomination silver coins that are mostly copper. Some up-timers will end up selling stuff for silver that turns out to be copper. This makes the up-timers, at least most of them, hesitant to take down-time silver coins. The First National Bank of Grantville accepts silver coins but only after assaying them.

The value of a large number of coins as judged by their metal content is difficult to determine with precision. Coins can be devalued by clipping, shrinking or adulteration. If you have a hundred coins and a few of them are clipped or shrunk and you put them all on a scale, you will get the same weight as if you have a hundred coins and half of them are adulterated with copper. So, if you go by weight, you're going to end up paying silver prices for a weight of copper.

That is, however, much less of a problem for the up-timers than it would be for the down-timers. Starting with a coin-operated vending machine—or perhaps two or three of them—you can readily develop a device that will sort coins individually by size and weight. Uriel Abrabanel, as a banker, has a stock of local silver coins from various mintings. Without costing Uriel much, if anything, those coins can be used as a base line to test the equipment. A few representative samples can be further tested to determine with precision their metallic content.

From very early on the Bank of Grantville and the Credit Union are in a position to judge down-time coins. Private individuals and merchants mostly aren't.

There was a fairly consistent "company store" mentality in the towns and cities of Germany at the time, a concerted and consistent attempt to restrict where the villages could buy and sell. Various authorities in various places would write laws requiring that villagers within a certain distance buy and sell only from the town. From the first trade that is made, the up-timers in the Ring of Fire are net exporters, simply because they have so much and their machines make their labor so much more productive. The up-timers are unwilling to be restricted in who they can sell to or buy from. From the very beginning of Grantville's arrival, the towns of Germany are in no position to enforce such restrictions outside of their own walls.

Before the Battle of the Crapper there would have been some consideration given to the possibility of using force to get the up-timers to follow the rules—or at least to punish the villagers for buying from within the Ring of Fire. After the Battle of the Crapper, that is no longer a consideration.

In the summer of 1631, the only reason that the towns can still enforce their trade restrictions in town is that the up-timers decline to force them to stop. As a result, during the summer and fall of 1631 the towns around the Ring of Fire are walking a very fine line, trying to maintain their control of the surrounding countryside while not taking any action that the up-timers would consider justification for the use of force. Looked at in this light, the little incident with Gretchen and Jeff after the battle of Jena has some additional connotations in terms of what sort of restrictions the city governments can get away with placing on their citizens. So does Mike Stearns' discussion of printing cooperation.

This doesn't endear the up-timers to the towns and cities of Thuringia, but it sure makes them popular with the farming villages. Advanced sales of some or all of a village's food crops helps with the food shortage in the winter of 1631-2. However, most of the people living in farming villages are in a state of perpetual debt. Much of the crop is already contracted to local towns. It's hard-to-impossible for the farmers to sell where they want until debts are paid off.

These political factors have an effect on how towns and farming villages react to up-timer money. The towns would prefer not to take the up-timer money and the farming villages would prefer to have it accepted. However, the towns are in a bind. They are losing their market to the up-timers. Not just the villagers, but also the merchants—who the towns have less control over in the first place. The towns need to be able to sell their goods to the up-timers. If they can't, their situation is going to go from economically precarious to out-and-out disaster.

Badenburg, Rudolstadt and Saalfeld, being closest, are affected first and most strongly. Uriel Abrabanel takes some heat in the early days for his acceptance of the American dollar. The fact that his niece sits on

the Emergency Committee of the up-timers prevents that resentment from taking the sort of concrete form it might have otherwise.

Faced with little in the way of other options, Badenburg, Rudolstadt and Saalfeld took an "If you can't beat them join them" approach. The American dollar became acceptable currency in those towns and the villages near them while production started moving from inside the Ring of Fire to all three towns, HSMC in Badenburg, USE Steel in or near Saalfeld, Krause Furniture in Rudolstadt, and many more. By the spring of 1632, the three towns around the Ring of Fire and the surrounding farming villages had effectively merged in terms of trade. You could buy products produced in any of them, in all of them, without special restrictions. You could buy little things, like buttons. Things that cost less than even an American dollar. A whole new market opened up for the manufacturers of the Greater Grantville Area. Retail was born. And since the market was there, it became suddenly worth the effort and cost to make labor-saving devices that let you make lots of little things more quickly and cheaply.

Buttons and latches and files! Oh, my!

All of which the spies and other visitors to the area talked about when they got home, generally taking examples with them.

Spring planting in the region took full advantage of tractors, hastily constructed greenhouses and other up-time innovations, so that yields were generally improved and the yield of vegetables drastically improved. The use of greenhouses to sprout vegetables before the last frost of winter for planting outdoors later was labor-intensive, but—thanks to the tractors—the labor was available. Not that everyone, or even most, in the area were interested in such innovations, but enough were so that the tractors were kept busy and the greenhouses full. This produced a noticeable increase in food and other agricultural products. Prices for agricultural products that had been high in the first winter went down.

On the downside, by the summer of 1632 what they could do with just what had come with them was mostly already being done. The rate of economic expansion slowed as they had to wait for new tools-to-build-tools to come on line. Expansion didn't stop; it just slowed to something closer to what one might consider a sane rate of expansion. Roads were still being built as fast as they had been before, but there were more to build. New businesses were still starting but they were having to wait for their production machines to come out of the machine shops, whereas most, but not all, of the new businesses in 1631 had been able to use modified up-time equipment.

Also, by 1632 the majority of people who have dealings involving American dollars have not seen the Ring of Fire. This is a change from 1631, when checking it out only took a couple of days walk. There is a noticeable difference in the response to American dollars between those who have seen the Ring of Fire and those who haven't. Those who haven't seen it but have just heard about it, even from a reliable source, may believe but still take with a grain of salt the miraculous event. So they look on the pieces of paper that the up-timers use as money with considerably more skepticism.

Somewhat countering this is the increasing availability of crystal sets and the increasing range of the Voice Of America. The money market that developed in Grantville in 1631 and the exchange reports that give weekly or daily reports on the relative value of American dollars, plus the extended Abrabanel family's acceptances of American dollars and stated willingness to buy them with silver provides more than just a floor. It also provides an endorsement. "If the Abrabanel, canny merchants that they are, are willing to buy American dollars, there must be something to American dollars."

By 1632 the economic advisors of various nations of Europe are getting information on how up-timer money works. Or, rather, how it worked up-time. Depending on the advisor and the government being

advised, they may look at this as a way of scamming the hoi polloi, or as a valid economic system. Most fall somewhere in between. Monetary metals have a lot of inertia on their side, in terms of people's belief that silver and gold have innate value. There will be quite a bit of head-shaking about how even peasants can be so gullible.

However, as the advisors and governments look at it, the more observant of them will see the trend of silver and gold flowing into the New US and out of the surrounding areas. It will take observation, because at that point the New US is still small enough that it's barely a blip in the overall economy of Europe. It will be visible because the economy of Europe is a forest that can't be seen for the trees. A few items will have reached places like Vienna, Rome, London and Madrid, but they will be curiosity cases. Agents will have reported on the phenomenal productivity of the area right around the Ring of Fire and the increase in general trade in the area as the roads get better. But it will as yet be fairly difficult for most to see it affecting them in any major way. It's too small and far away. Like a campfire three valleys over, you might get a whiff of smoke, but that's about all. The whiff of smoke in this case is rumors in the merchant circles that "This New US might be an interesting place to invest a few bob. If it survives that is. If it doesn't get run over by one of the marauding armies."

By mid 1633 it's still a distant flame, but more of a bonfire than a campfire. It's starting to get really noticeable. Merchants have started putting their few bob into manufactories along the Saale River, most of which are using small one-to-five horsepower steam engines. Magdeburg is being rebuilt with Simpson's naval base and starting to look like a bonfire, too. But as fast as they are turning out goods in both places and innumerable places in between, they are not even close to keeping up with demand. Another fire is starting along the Werra River in and near Eisenach, where the improved roads connect it to the Ring of Fire and the Saale corridor. With good roads to Eisenach and the rail line rapidly approaching the navigable part of the Saale River, it's cheaper to ship goods produced in Bremen to Halle by way of the railroad and roads than by river. The up-timers and their down-time partners aren't just making money by manufacturing but by transporting goods as well. In the process, the price of even down-time produced goods is going down while the variety goes up.

More important to the foreign powers looking on is the increasing souvenir market. People are going to go look at the Ring of Fire and while there are buying souvenirs. An important souvenir will be photographic prints of the Ring of Fire. Which means that even those down-timers who aren't able to go to the Ring of Fire themselves are able to see clear photorealistic images of it. Plus all sorts of knickknacks, some few of which were actually produced up-time. So, belief in the Ring of Fire increases and so does tourism and along with it comfort with up-timer credit money.

Also by 1633 Gustav Adolph, who introduced large copper coins in 1624 because he was short of silver, is very interested in American dollars and what he can do in a similar vein. One thing that he can do is introduce the Copper Dollar, a paper money that is based on a given weight of copper. Note that this is not canon that I am aware of but is likely. What he won't be able to do—or at least will be advised against—is the introduction of credit or fiat money. This mostly because he overvalued the copper coins when he introduced them in 1624, so his credit isn't any too good.

That changes with the creation of the USE in the fall of 1634. The New US Federal Reserve becomes the USE Federal Reserve and the right of princes and cities to mint their own coins is drastically curtailed, though probably not totally eliminated. This noticeably displeases any number of German princes, including John George of Saxony and George William of Brandenburg and is one factor—but only one—in their declining to accept the USE. It also produces resentment against the up-timers and the Stearns government among those who made all or part of their income through seigniorage. It's not really a step the USE government can avoid, because failure to curtail private minting would pretty much amount to having government-sanctioned counterfeiting operations running.

Meanwhile, silver is arriving through trade and through increased mining operations allowed by up-time pumps and other up-time equipment. Improved refining techniques allow for more silver to be gotten from poorer ore and, for that matter, from copper through electrical refining. Taken together these things have the effect of a major silver and minor gold strike in the State of Thuringia-Franconia

By 1635, large amounts of information on industrial processes have poured out of the Ring of Fire into the rest of Europe. And to a great extent that knowledge of improved production techniques has gone directly into the hands of the courtiers closest to the crowns. This noble bud of his Majesty gets the right to make internal combustion engines. That old friend gets the right to manufacture toilets and plumbing systems. This imperial city gets the right to make typewriters, that one the right to make sewing machines. And, of course, it becomes a crime for anyone else to do it. Not everything, of course, nor in every country. But have no doubt that the powers that be will want to restrict by law who is and who is not allowed to get in on the new gravy train. And the kings will write and sign the laws with one hand while the other takes their gold in exchange.

But these would-be monopolists quickly run into a difficulty. Who can buy all these new products? They have just given a fortune—another fortune—to the king. The peasants have even less money than they had before. More of the middle class, small as it already was, was looted to get the money for the bribes. In the New US and now the USE, the problem has been sort of solved by giving credit to the poor and middle class. Which, in turn, is made possible by the controlled increase in the money supply.

So how are the other nations of Europe going to respond to this?

In our timeline it's the Weimar Republic in the 1920s that is the cautionary tale of hyperinflation. Complete with pictures of people burning bundles of bills to keep warm. Though there are numerous examples of hyperinflation both before and after, the Weimar Republic is the one people point to. The causes for hyperinflation are the subject of economic debate, but in general it's a debate of "which model" rather than "what's happening." What's happening is that the minter/printer needs money and minting/printing more seems the easiest, best, or only way to get it.

Okay, hold it right there for a minute. We have a naming problem. The problem is that in the modern world there are two sorts of people that produce specie, whether coins or notes. Those are: employees of national governments and forgers. In the seventeenth century there were several shadings we don't have. Sometimes governments issued currency directly. Sometimes they sold or rented the right to issue currency. The people who had that right, whether government or individuals, contracted with private mints for the coining. And the private mints often added a little more base metal to the mix and pocketed the extra coin. Also, it wasn't just national governments that issued money. Lots of cities had the right to issue their own money, so did many and varied members of the nobility and who knows who else. So when it came time to weigh the coins there were lots of folks to blame.

There were also mints minting coins in one country with the full legal recognition of their governments for distribution in other countries. Often these were coins that looked quite a bit like a more valuable coin from the country of distribution. It was all mints then. There was paper money and the Bank of Amsterdam bank notes were preferred over coins, but it was, in today's terms, more like checks or bearer bonds than what we would recognize as paper money. There were also accounts with the local merchant, often paid off in kind with no coins ever changing hands. Almost modern money . . . but not

quite. Close enough so the concept isn't hard for the down-timers to get their heads around, whether that particular down-timer is a financier or farmer.

I can't just talk about governments and their monetary policy because it was often not the government making the decision as to how many coins, how much silver, and how much copper went into the mix. Nor is there any particular reason to believe that the same people who got the minting franchise won't get the printing franchise. So the person deciding how many guilder or pound notes might be the king, a member of his privy council, or it might be a printer in Cornwall. It might be the city council of Vienna or an imperial knight who owns a print shop and has a friend who has a friend in Ferdinand's court.

So what I am going to do is use the word "Issuer" as a sort of catchall, including governments and people authorized to one extent or another to act for the governments in introducing cash money into the system.

The economic situation in seventeenth-century Europe was borderline hyperinflation territory before the Ring of Fire. That is to say that it had all the factors that encourage Issuers to try solving their financial problems by creating loads of new money. With the addition of the Ring of Fire, the stresses that cause hyperinflation will be multiplied. If you're a major merchant or wealthy noble looking at the situation, you're probably going to feel that your money is safer in the USE than it is in your own country. It's almost certainly going to bring a better return. At the same time there are all those goodies to buy. So you're not only investing in the USE, you're buying fancy goods from there.

As money flows into the New US and later the USE, it's flowing out of the other nations of Europe in a time when the money supply was not adequate to the needs of the economy. It's hard to start competing industries when you don't have the money to invest in them. But that's nothing compared to the virtual impossibility of having those industries be successful when no one has the money to buy what they produce.

Then there are all those armies to pay, powder and shot to buy. The Thirty Years' War went a long way toward bankrupting Europe in our timeline.

And finally there is simple greed. Since the right to mint money was bought and sold in the Europe of the time, how much money was in the economy was limited pretty much exclusively by the amount of monetary metals available.

Time for a short break to look at what hyperinflation is. It's a positive feedback cycle. More money, to less confidence, to still more money, to still less confidence, to still more money. . . . On and on until something drastic happens to put the brakes on.



Kipper and Wipper was an example of hyperinflation which acted as a cautionary tale in our timeline and

kept the Holy Roman Empire money stable for a hundred years or so. But the money stayed stable at the cost of a depression which was hidden by the Thirty Years' War. Hidden or not, that depression—as much as the war—was a cause of the second serfdom. The poor are hurt by depression much more than the rich and their bargaining position is hurt even more. In the case of Kipper and Wipper, it wasn't the amount of extra money so much as the perceived loss of value because of a lower silver content. The increase in the money supply was certainly inflationary but not really hyperinflationary. Which gives some credence to the Neoliberalism notion that hyperinflation is the result of a crisis of confidence.

Whether hyperinflation starts with more money or less confidence, it's the positive feedback that kills you. Now we add in the "American dollar" that has no silver or gold in it and doesn't even pretend to represent silver or gold. Yet people have confidence in it. At first this is because of the Ring of Fire itself, then because of the stuff you can buy with it from the Ring of Fire, then because the neighbors trust it. At first the Issuers of the CPE and the rest of Europe will scratch their heads in wonder at how the up-timers are getting people to accept money that isn't based on monetary metals. Then at some point they, or at least some of them, will say to themselves, "If the New US can do it, so can I!"

With any luck at all they will start slowly. I suspect that the first groups to print money outside the New US will print silver certificates of one sort or another. The Dutch were already, sort of, doing this. What will be new is that they will print more money than they have the silver to exchange it for. The *Amsterdamsche Wisselbank* or Bank of Amsterdam was a reserve bank. There was silver or gold in the vault for every guilder it issued. Silver certificates will work fine as long as everyone has confidence that they can exchange the paper for silver or gold should they want to. The Issuers won't necessarily want to show that sort of restraint, but for the most part they are going to find it a bit harder to sell credit money than the up-timers do.

It's important to note here that the first effects of increasing the money supply will be good. New businesses will start, people will have a little money in their pockets. They will make more goods and provide more services because they will be able to sell them easier.

Some of modern economic theory has quite a bit in common with Mercantilism but one important later realization is that it's not a zero-sum game. That economies grow without necessarily causing their neighbor's economies to shrink. Improved production means more goods and the money supply needs to reflect that fact. Almost as obvious is that it is, over the short term, a limited-sum game. You can't just make an infinite amount of new money and have infinite goods and services appear magically to absorb it. The question is: How much money can you add and have an overall positive effect on the economy?

With the Weimar Republic in mind, and the natural fear about how "the peasants from the middle ages will react to paper money," plus the fact that the only news they have heard in their lifetime is news of inflation, the New US Fed is going to take a conservative, "safe" approach to the question. Other Issuers will not feel the same level of restraint.

When Wallenstein, Lichtenstein and their partners acquired the right to issue currency in the sixteen-teens they did so by paying the Holy Roman Emperor an annual fee, which was standard practice at the time. It was then up to them to buy the silver, mint the coins, and distribute them by using them to buy stuff. After paying the emperor for the privilege, buying the silver and paying for the minting, the money produced was theirs to do with as they pleased. The more they produced, the greater their profit. There is no particular reason to think that printing money will be treated all that differently. Some differently, yes. There will probably be limits set on how much money an Issuer can produce, perhaps requirements that he keep so much silver on hand to exchange for paper currency on demand or, more likely, he will be required to pay the crown in silver. That kings, emperors and city councils will suddenly stop thinking of the right to issue money as an income source is not at all likely.

In fact, it's probably not possible in terms of income stream. Seignorage was a significant part of the royal income which was not fully distinct from government income. In effect, it was a flat tax on everyone who used money. So, as the governments are losing other income streams in the form of provinces lost to Wallenstein, Don Fernando, the USE and so on, they are unlikely to be able to afford the loss of revenue that a federal reserve system would entail, whether the governments get that money by issuing it themselves or selling the rights to issue it.

That probably needs a bit of explanation. In the good old days the Issuer just minted money and bought stuff. Good for the Issuers, but not for the rest of us. In a modern federal reserve system, the new money is loaned to banks and in turn to the rest of us. Seignorage is mostly paid to borrowers in the form of lower interest rates. This allows not only for the adding of money to the system but for its removal as the loans are paid back.

Where were we? Right. The kings and potentates are losing territories and the income those territories generate, but not necessarily losing the expenses along with the income. Wallenstein's army in the Thirty Years' War was paid for by Wallenstein, not Ferdinand II. He financed the army he commanded and was to receive territory in return. He wasn't intended to receive as much territory as he did in the 1632 universe, even if Ferdinand II hadn't had him assassinated in our timeline. Still, the assassination of Wallenstein and the seizure of his lands was the only thing that put the Holy Roman Empire in the black, even temporarily, in our timeline. I don't know what the arrangement was for the payment of Don Fernando's troops in his campaign in the Netherlands, because that didn't happen that way in our timeline, but fairly standard practice would have been to make him (that is, the Spanish Netherlands) pay for at least part of it.

The New US, at first, isn't paying taxes to anyone but the New US government, so those towns, cities and lands are being taken out of the income stream starting in 1631. When the New US joins the CPE, it helps Gustavus Adolphus' income stream tremendously but most of the territory he gives them is territory that at least nominally belongs to the Holy Roman Empire—still more of the HRE tax base gone. When the USE comes into existence, it includes a really big chunk of what used to be the Holy Roman Empire and which directly or indirectly paid taxes or fees to that body. The HRE actually owned a lot of that land as the government, so when the USE came into being the HRE not only lost taxes, it lost rent income as well. And the same is true of Wallenstein's Bohemia. Since the Ring of Fire, the HRE has lost something like two-thirds of its territory and three-quarters to four-fifths of its income. Because Bohemia was a real cash cow.

France, at first glance, seems to be in pretty good shape, but it has been sending money to the various parties involved right along and debasing its currency to do it. It has just bought North America from England and paid King Charles a fortune for it. Which Charles needed, because he hasn't called Parliament into session in a decade or so.

The northern Italian states like the Venetian Republic are in a relatively decent financial state. "Relatively" being the operative word. The southern Italian states are, at the moment, a drain on the Spanish economy. As are, by now, the central Italian states.

Spain is spending more money in Italy than it did in our timeline, and has lost the resources of the Spanish Netherlands. But that isn't Spain's real problem. Spain's real problem is "Rule Espainia." In the sixteenth century, Spain got rich from its conquests in the New World. It won the lottery—then spent more than even that provided. "Pissed it all away at the track." "Blew it on fast women and fast cars." So that Spain by now has champagne taste on a beer budget. The Spanish government is convinced that it is the natural ruler of the world. After all, the pope has said so. He divided the world between Spain and

Portugal and Portugal is now part of Spain. The fact that the rest of the world, including Portugal, doesn't agree is irritating but not significant. It would require a major change in direction and Spain isn't set up for changing course. There are way too many vested interests who have too much to lose. Spain has not been kind to its possessions. It can't afford to loosen its grip lest they rebel. It needs an army, a large one, to avoid disintegrating.

The Polish Lithuanian Commonwealth money was in the hands of the Grand Treasurers and a series of lesser officials. None of them were paid. Corruption wasn't just rampant, it was standard practice. Which really isn't all that different from the rest of Europe. When you add being able to just print money without having to actually acquire silver to the acceptability of corruption . . . well, let's just say things can get out of hand.

Russia was reduced to paying for most of what it got in goods of one sort or another because it simply didn't have any money to speak of.

The Ottoman Empire was huge but regimented. I haven't found out much about their monetary policy except for the fact that they, like everyone else, seemed to be monetary-metal based. Their guilds were government controlled and prices for goods produced in the empire were set by that government. Their merchants weren't so controlled, and set their own prices. And the whole focus of governmental policy was stability centered. Economic growth was limited to territorial expansion. However, the central government had, at best, limited control over what went on in the provinces. I don't know who minted the money, but it was decreasing in silver and gold content.

Let us not forget the USE. A change in administration can lead to a change in policy. Should Wettin win the election, he is going to have favors to pay back and someone is going to want the treasury, someone is going to want to take over the USE Fed or abolish it. Having the keys to the mint is a plum post if you're looking to get rich. And it will be argued that the income from seignorage is properly the king's income to distribute as the government wishes. It will also be pointed out that that income would pay for a couple of good-sized armies.

Don Fernando is going to have expenses, too, what with the new wife and buying an airline. These things add up. Besides, the new wife's family is a bit short of funds at the moment and will probably be hitting him up for a loan. A bit of bad advice and the Dutch guilder could take a nose dive.

Any monetary system requires restraint and in Europe in the seventeenth century, the lack of large quantities of silver and gold was the only restraint that they had. Everything else was designed and focused on producing the most coins and getting the most profit out of the system.

Sigh.



It's a disaster waiting to happen, ain't it, folks? All over Europe, all the evil, corrupt money men printing paper money by the cart load. The restraint of silver scarcity gone. Nothing at all to restrain their monstrous greed. Except . . . for the most part they weren't evil, corrupt men. Really, they weren't. Even the Polish Grand Treasurer who complained "Who's this son of a bitch that I failed to pay off?" probably wasn't a particularly evil man. Paying and accepting bribes was a standard part of business and politics. Nor were they stupid men; they got to the top in a very rough game.

For the most part, these are men who will risk their lives, fortunes and sacred honor in defense of king and country. Yes, they take bribes and pay bribes. Yes, they mint as much money as they can and pocket as much as they can of it. But they are doing it that way because that's the way business is done. The large majority of these men are going to realize that some form of restraint on the money supply is needed. Granted, they are going to be a lot more concerned with restraining "that corrupt bastard in the next county" than in restraining themselves.

Of course, it doesn't take all of them screwing up. All it will take to bring about hyperinflation in a given country or province is a couple of corrupt individuals or a prince in desperate need of money . . . and there are plenty of both in Europe. Politics will certainly trump economics. So the good news for the 1632 writers and bad news for Europe is that the field is wide open. By 1633 the American dollar started to give the notion of paper money credibility. Partly this is true because the Bank of Amsterdam already had it, or at least something very close to it, so it wasn't a wholly new concept. Whatever the reason, by 1633 paper money is starting to look like a really viable alternative to coins. We know that the HRE has introduced silver certificates that are, at least in theory, matched by silver in the HRE vaults. And that paper money is at least in the planning stages in Russia.

It's up to you writers out there to determine what they are doing in France, Spain, Poland, and even in provinces of the CPE and USE. In England the king can't start printing money without the consent of Parliament and he hasn't called Parliament into session. So pound notes are going to take some finagling. Considering Charles, it's not impossible that he will start printing pounds without the consent of Parliament.

There are a couple of things to remember. Almost universally, monetary systems are slow to react. It takes a while for people to decide not to trust money. And it will take longer for paper money than silver coins because the value of paper money can't be measured directly, only in terms of buying power. Which is all that really matters anyway. The first results of introducing new money into the economic systems of Europe will be improvements in those economies because pretty much all the economies of Europe are cash-strapped. That was true of Kipper and Wipper and will be even more true of paper money.

So go forth and write money stories . . . or stories that mention coins, paper and inflation. Enjoy.

The Wind is Free: Sailing Ship Design, Part 1:

Propulsion

Written by Iver P. Cooper



An early seventeenth-century explorer, Captain David Pieterszoon De Vries, told the Duc de Guise, "My ambition is to travel and see the whole world in all its four quarters." Three-fourths of the world is ocean, so it's not surprising that he became a seafarer.

In his day, sailing ships were the *sine qua non* of world commerce. Sailing ships brought colonists and goods to the New World, and gold, silver, tobacco and sugar back to Europe. They competed with the caravans of the Silk Road for the spices of the Orient, and ferried grain and timber across the Baltic.

However, the seventeenth century was not the pinnacle of the Age of Sail. The art of sailing ship design continued to advance, and the tall ships of the nineteenth century were bigger, faster and safer than their seventeenth-century counterparts. While the twentieth century marginalized commercial sailing, it witnessed great advances in the sciences of aerodynamics and hydrodynamics, and this found practical application in the design of racing and pleasure yachts.

The question before us is what will be the impact of the Ring of Fire on the maritime world. Will sailing ship design be revolutionized, or will the Age of Sail be cut short by the new Age of Steam?

I don't expect the immediate demise of the sailing ship thanks to steamship competition. Yes, the US Navy began building steamships in 1633, and uses them quite effectively in the Baltic War of 1634. But steam won't be competing with sail until the necessary steam engines and screw propellers are perfected. This will happen a lot faster than it did in the nineteenth century but it won't be instantaneous, either. (You also need to have a cheap source of coal, and preferably iron as well; the lack of these resources was one of the reasons that Dutch shipbuilders were late converts to steam power.)

Even then, the steamship routes will be limited by the steamers' coal capacity and by the distribution of coaling stations. Historically, steamships weren't able to compete on the Europe-Asia route until the Suez Canal was built, avoiding the long, lonely arc around Africa. Thereafter, sailships were still able to compete on the southern route around Cape Horn, where they could avail themselves of the reliable, strong winds of the Roaring Forties. At least until the Panama Canal made the Cape Horn passage unnecessary for steamers (sailing ships couldn't use the Panama Canal because of endemic calms).

I don't think Murad the Mad is going to permit the digging of a canal between the Mediterranean and the

Indian Ocean, and the Spanish are equally unlikely to want to make it easier for other Europeans to enter the Pacific Ocean. So I believe that there will be a demand for commercial sailing ships for at least several decades.

Sailing warships could remain at sea for as long as the fresh water, cooking fuel, and provisions lasted. A warship might carry two-and-a-half months of water and six months of food.

(Monceau 50). And a sailing ship didn't carry any fuel. In contrast, *HMS Warrior* (1861), steaming at 11 knots, consumed 3.5 tons coal/hour, and only carried 853 tons. At 14.5 knots, it consumed 9 tons/hour. (Hill) It was, perforce, a sailing ship with auxiliary steam.

One must also remember that there isn't a single book on shipbuilding history which fails to mention what is politely called the "innate conservatism" of sailors. And it is even alluded to in Flint, *1634: The Baltic War*, Chap. 31: "The transition from sail or oar power to paddlewheel steamers had required greater mental flexibility than most up-timers would have expected, for a lot of reasons, and some people—whether up-timer or seventeenth-century—simply lacked that flexibility."

For these reasons, it will be some years before steamships take over ocean shipping routes, even though it is clear from the up-time books that steamships are a viable long-term proposition.

Shipspeak

Ahoy, ye landlubbers! A "ship," in the seventeenth century, was a large seagoing vessel. In the nineteenth century, a "ship" came to mean either a vessel with three masts, or, more particularly, a "ship-rigged" vessel (explained below). Even then, it retained the more generic sense used in maritime law. Nowadays, when three-masted sailing ships are rare, it usually means just any large vessel and that is how the term will be used here.



Wind is important for sailing ships, and so the direction the wind is blowing from is "windward," and that

it is blowing toward, "leeward." A ship pushed unwilling in the latter direction is suffering "leeway," and must fear the "lee shore." If the ship is heading more or less downwind, it is "running," if the wind is more or less over the beam, it is "reaching," and if it is fighting its way upwind, it is "beating." A beam reach is a course such that the wind is coming right over the beam, a close reach is a bit closer to the wind, and a broad reach a bit further from it. A wind which is coming from a direction in-between beam and stern is called a quartering wind.

The term "rigging" refers to the vessel's entire sailing apparatus: sails, spars, and cordage. Ships may be classified according to their hull shape (flyboat, hoy, pink, zebec), rig (brig, ketch, schooner, sloop, snow), or a combination of the two (bark). (Svensson).

Spars are the relatively rigid vertical (masts) and horizontal (yards, gaffs, battens, booms, bowsprit) structures used to support the sails. On a three masted ship, the masts are (from bow to stern) the foremast, mainmast and mizzenmast.

The cordage, originally ropes, are the flexible lines which manipulate the sails and yards (the "running rigging") or stabilize the spars ("standing rigging"). The latter are typically in a fixed position, and run mostly between the mast and the deck.

The larger seventeenth-century ships carry square-rigged sails, so called not because of their shape (actually trapezoidal, with a bottom arc called the "roach"), but because in their neutral position they are "square" (perpendicular) to the keel of the ship. They are carried on horizontal supports (yards) which cross the masts, and the yards can be "braced" (turned) so the sails better catch the wind. The modern yachting equivalent of the square sail is the spinnaker (Gougeon 96).

All ships carry one or more fore-and-aft rigged sails, so called because in their neutral position, they run fore-and-aft, that is, parallel to the keel of the ship. Square-rigged sails trap the wind whereas the fore-and-afts act as airfoils.

There is some variety in the shape of fore-and-aft sails; typically they are either triangular (lateen, Marconi), or a right-angled trapezoid (sprit, lug or gaff). If mounted on a yard from a mast, the yard may either cross the mast (lateen, lug) or end at it (gaff, Marconi). The sprit hangs from the bowsprit, rather than a mast, and triangular staysails from a stay, a rope supporting a mast. Staysails hung in front of the foremast, and running down to the bowsprit, are called headsails or jibs. (Headsails were a sixteenth-century Dutch innovation, so the square sails on the foremast wouldn't shield them from a headwind, see Laing 46.)

A ship is referred to as square-rigged, full-rigged or ship-rigged if it has at least three masts and each of these masts bears at least one square-rigged sail. The fore-and-aft sails on a "square-rigged" ship will usually be staysails, or the lowest sail on the mizzenmast.

The Importance of Speed

In the seventeenth century, people were accustomed to taking a very long time to get anywhere. A round trip from Europe to Japan, with leisurely stopovers in Madagascar, India and Java, might take five years. The passage from Europe to America averaged two months, but no one was surprised if it took six instead. The twentieth-century preoccupation with speed is going to come as something of a surprise.

Big warships had big superstructures, carried lots of cannon, and tended to be on the slow side even when on their own. If in a fleet, they needed to maintain formation, and the bigger the fleet, the slower it traveled.

As for merchantmen, for most cargoes, getting to their destination and getting there with a lot of it, was more important than getting there fast. In time of war, most British merchant ships traveled in convoys and then speed was limited anyway by the speed of the slowest ship. (McCutchan 24; Laing 92).

The main reasons for speed were that the ship was carrying a perishable cargo (like slaves in the eighteenth century, or tea in the nineteenth) or that its cargo was contraband and it had to avoid the coast guard (and the cargo paid well enough so the shipowner could trade off cargo capacity for speed). Privateers also needed speed, so they could catch a merchant vessel when it showed them its stern.

While there was certainly smuggling and privateering in the seventeenth century, there wasn't much emphasis on speed in ship design then. (Gougeon 24). In fact, even in the early nineteenth century, capacity was more important.

Wind Propulsion

A sailing ship, by definition, is propelled by the wind. Its force (and energy) are transferred to the sails, and thence to the spars and hull.

The simplest situation to visualize is the one which the ship has square-rigged sails and is running directly downwind. Such sails act like parachutes, obstructing air flow. The wind strikes the sails perpendicularly, the air piles up against the canvas, and it pushes against the windward side of the sail. A fresh breeze, perhaps 12 knots, creates a pressure of one pound per square foot (White 494), and the force is the pressure times the effective area. The force is transmitted by the rigging to the hull, and the ship moves forward. (Because the "center of effort" of the wind force, determined by the distribution of the sail area, is well above the ship's center of gravity, the ship will also be rotated so as to dip its bow.)

The next possibility is that the wind isn't quite directly downwind, but the sails are turned ("braced") to face the wind. The wind still strikes the sails perpendicularly, but now the applied force is oblique to the direction that the bow points. One component of the applied force will drive the boat on the set course, but the other will drive it perpendicularly from that course. The resulting angular deviation is called "leeway." (Leeway is resisted by a hydrodynamic force, the drag excited by attempting to push the ship sideways through the water.) The leeway on Cook's *Endeavor* was 11-17° (Phillips-Birt 249). Moreover, that leeward force component also tends to rotate the ship laterally, causing it to "heel."

The third possibility is that the wind strikes the sails obliquely. Only part of the wind force is applied by collision to the sails, so the sail is less efficient in capturing the total wind force. However, the ratio of forward to lateral force is more favorable.

Obviously, the square sail is not suited to sailing upwind; the wind would strike the front side of the sail and try to push the ship backward. However, skippers sometimes took advantage of this weakness, deliberately positioning the square sails so that the ship was "taken aback." The ship could be made to stand still, despite a wind blowing, or to turn on the proverbial dime. (Svensson 48).

The ideal position for a fore-and-aft sail is at about a forty-five degree angle ("of attack") to the wind,

and they work by presenting an airfoil. A "lift" force is generated in the forward direction, only the sail's orientation to the wind is such that the lift is horizontal (rather than vertical as on an airplane wing), and at least partially in the direction that the ship wants to go. Thus, such sails can be used to claw upwind, because they can be angled so the ship is "sucked" forward, and the boom is freer to swing about. (The sail also experiences a lateral force, creating leeway. Gougeon 91).

Eddies form behind a square-rigged sail, and, if the edge flutters, in front of it, too. This wastes wind energy. Fore-and-aft sails are more efficient than square-rigged sails of the same area because they form fewer eddies (93).

Nonetheless, square sails are more efficient than fore-and-aft sails when moving downwind, especially in light air. That is because when the wind is closer to the stern than forty-five degrees, fore-and-afts can't maintain the ideal angle of attack, because the shrouds (lines) get in the way of the boom. (113). If the mast were free-standing (no shrouds), that wouldn't be a problem, but a free-standing mast would have to be thick (adding weight) and require more ballast (more weight)(156).

Windage. When the winds are of gale or hurricane force, the ship can move even with bare poles ("scudding"), because of the force of the wind upon the parts of the ship above water level ("windage"). This is particularly true if the wind is on the beam of the ship. Svensson mentions that seventeenth-century ships had high stems, and therefore were susceptible even to quartering winds.

Upwind Travel. No conventional sailing ship can sail directly upwind. In general, fore-and-aft rigged ships can sail closer to the wind than square-rigged ones can. Typically, a fore-and-aft rigged ship can sail within four points (45°) of the wind, whereas a square-rigger is limited to six points (68°). (Laing 72; Phillips-Birt 228).

Both can nonetheless make progress directly upwind by tacking, that is, zigzagging diagonally so the wind comes alternately over the port bow (port tack) and over the starboard bow (starboard tack). This is of course quite slow, as not only do you have to sail constantly close-hauled, which is hard on both crew and rigging, you are taking an indirect path, which takes extra time, and you lose more time whenever you change tack.

A square-rigged ship usually changes tack by turning its stern through the eye of the wind (jibing, wearing ship)(Gougeon 11). It might make a mile long arc in the process, wasting time and perhaps being blown downwind to boot. (Mountford). The alternative maneuver (tacking, coming about, boxhauling) was used only when absolutely necessary (too close to a lee shore?), because it required a skilled crew and precise timing.

On the other hand, in a fore-and-aft-rigged ship, tacking was preferred. Jibing is slower than tacking (you are turning the long way around) and you are blown further to leeward in the process.

Apparent Wind. The force of the wind on the sails is what drives the ship forward, whether that be a drag force on the square-rigged sails or a lift force on the fore-and-aft rigged ones. We can consider the force to be proportional to the effective sail area (which depends on both the porosity of the sails and their angle with respect to the wind), and to the **square** of the speed of the wind.

The wind that the sail reacts to isn't the true wind (what would be measured by a stationary observer). Rather, it is what ship designers call the "apparent wind," the vector sum of the true wind and a "virtual wind" generated by the ship's own motion. If you are sailing directly downwind, the apparent wind is simply the true wind *minus* the ship speed.

If the ship is initially at rest, the apparent wind has the same direction and speed as the true wind. If the ship is running with the wind aft of the beam, then, as the ship picks up speed, the speed of the apparent wind declines, and the wind strikes the sails at a less favorable angle as a result of pitching and heeling of the ship. Together, these dictate that the wind is less effective at driving the ship forward. At the same time, the resistance of the water to the movement of the ship increases as at least the square of the ship speed. Clearly, with the effective wind force declining, and water resistance increasing, the ship eventually reaches an equilibrium speed at which the wind force and water resistance are equal.

Points of Sailing. The maximum speed is reached on the ship's best point of sailing. This usually isn't running straight downwind. That's partly because of the aft sails obstructing the foresails, but a more important point is that the wind felt by the sails is then at its weakest.

As the true wind shifts off your stern, the apparent wind increases and seems to come from a direction further forward of the true wind. Once the apparent wind is forward of the beam (i.e., you are effectively sailing upwind), it's *stronger* than the true wind.

Unfortunately, a square-rigged ship isn't efficient sailing upwind. Typically, a square-rigged ship sails best on a broad reach or a beam reach. The training ship *Jean Bart* made 40% of the true wind speed close-hauled (6 points off the wind, sails braced 32°), 60% on the beam reach (braced 45°), and 50% on a broad reach (2 points abaft; braced 22-30°). (White 512).

James Cook's *Endeavor* (550 tonnes displacement, waterline length 101'5", beam 29'2", depth 11'4", draft 11'10", ship-rigged, sail area 10,000 square feet) sailed best with the wind a point or two abaft the beam, making seven or eight knots, and that it made six knots in a "topsail gale" and five in a "topgallant gale." (Phillips-Birt 248-9; ANMS).

With fore-and-aft sails, it can actually be faster to tack upwind than to run downwind, because the increase in apparent speed more than compensates for the zigzagging. In fact, iceboats can travel at speeds up to six times real wind speed! (Gougeon 157).

Speed Achievable. The *Mayflower* reportedly could do 7 knots in 24 hours, but its long-distance good speed was 4.5 knots. (Phillips-Birt 230?). He says that 10 knots was the fastest speed achieved prior to the nineteenth-century clipper (236), but other historians contradict this.

The fastest 24 hour runs ever reported for a commercial sailing ship were 465 miles (*Champion of the Seas*, 1854), 430 (*Lightning*, 1857), 421 (*Donald MacKay*, 1855), 420 (*James Baines*, 1855), 413 (*Great Republic*, 1856), and 411 (*Sovereign of the Seas*, 1853). (Villiers 388-9).

In Karen Bergstralh's "Moonraker" (*Grantville Gazette*, Volume9), De Roche believes that his ship will be able to sail from Europe to China in three months. In OTL, the record commercial run from England to China was 80 days, set by the 197' composite tea clipper *Ariel* in 1866. The distance is about 16,000 miles by way of the Indian Ocean. The fastest return passage (1869) was the 89 days made by *Sir Lancelot* , returning the same way, despite an unfavorable monsoon. (Villiers 383). The record run on the New York to San Francisco run, a similar distance, was about the same (Shaw xxv).

Modern racing craft can do better; the record holder is the 125' catamaran *Orange II* (24 hour run averaging 31.95 knots; trans-Atlantic, 28 knots; circumnavigated the world, 17.89 knots).(WSSRC).

The fundamental problem with the sailing ship was that it couldn't keep to a timetable.. In 1885-86, *Cutty Sark* made the wool run (Australia to London) in 72 days, but 12 of its 26 competitors, all fast ships, took more than 100 days. (Villiers 59). The steel five-master *Preussen* (1902)'s ten passages from

the Channel to 50°S averaged 59.5 days, but the range was 51.9-75.7. (394).

The maximum speed is, of course, dependent on the strength and direction of the prevailing winds. An early nineteenth-century man-o-war might expect to make 1-2 knots in a light breeze, 3-4 in a gentle breeze, and 5-6 in a moderate breeze (wind 13-17 knots). (Raper 133). The average speed for the *Preussen* (1902) in a favoring gale (Force 8, 34-40 knots) was 13.7 knots, but if was sailing close hauled, only 8.2. A four-master might achieve 11 and 6.3; an iron three-master 10.1 and 6.1, and a wood three-master, 9.5 and 5. (Villiers 389).

The captain will attempt to choose courses which let the ship take advantage of strong, reliable winds such as the trade winds, the monsoons, and the westerlies. Of course, there can be too much of a good thing; if a gale is encountered, the sails have to be reduced to avoid losing sails or even getting dismasted. According to nineteenth-century data, the average wind speed in the trade wind region of the Atlantic is about 5 meters/second (9.7 knots, Force 3), but in the Atlantic and Indian Oceans below 40°S, it is perhaps three times as fast, Force 7 (White 205; cp. CMS) . Brouwer discovered the Roaring Forties in 1610.

Rig Power. A standard measure of the sailing power of a ship when winds are light or moderate is the dimensionless ratio ("SADR") of the sail area (square feet) to the **two-thirds power** of the ship's displacement (cubic feet). The displacement is the volume of water displaced as a result of the weight of the ship (35 ft³/long ton) and the "two-thirds power" makes it a surrogate for the wetted surface area. The frictional resistance, the dominant resistance at low speeds, is proportional to that area.

The extreme clipper *Lightning* (1854) had a sail area of about 56,000 ft²(Lubbock 76), and displacement about 57,000 ft³(ChapelleSSUS 421), so the SADR was 37.8. An English "74" (1832) might have 22,325 ft²sail (Fincham 271) and displacement 106,505 ft³, for a 9.9 SADR. A nineteenth-century merchantman would probably be 6.5-10. (Fincham 499). For modern yachts, cruisers are 10-15, racers above 20, and high performance racers above 24.(USSailing). The *Orange II* is 92! (Staff).

If the winds strengthen, stability becomes an issue, especially if the wind is on the beam. The wind may cause the ship to heel over so much that it must reduce sail rather than capsize. This is particularly a problem for ships carrying excessive sail ("overhatted"); it has an advantage in light air, but its crew must respond rapidly to a change in the weather. (ChapelleBC 104). Stability is dependent on hull breadth, depth, and shape, and weight magnitude and distribution, as will be discussed in part 2. However, for nineteenth-century ships of similar form, the wind speed at which the ship must reduce sail was roughly proportional to the square root of the breadth.

If stability isn't a problem, the resistance created by the waves made by the ship will still increase dramatically as the winds propel the ship faster, and the maximum practical speed will be proportional to the **square root of the waterline length** of the hull. Indeed, the usually limiting speed in knots ("hull speed") is ~1.34 times that value: 22.2 for *Lightning* . It probably never reached hull speed for any significant length of time.

Rigging

Rigging Classification. A variety of rigs existed in the seventeenth century. However, back then ships

were named on the basis of their hull shape, and function, not their rigging. The following is a typical *nineteenth-* century English classification of *rigs* :

At least one square-rigged sail on...	Masts		
	1	2	3+
all masts	Nordland; Humber keel	Brig brigantine (fore-and-aft mainsail)	ship
all but aftmost mast	—	—	bark
foremost mast only	—	hermaphrodite brig; topsail schooner (only upper sails)	barkentine
mainmast only	—	—	"mainmast barkentine"
none	cutter; sloop	schooner; yawl; ketch	schooner

All ships required fore-and-aft sails for upwind performance. But all regular warships also needed some square-rigged sails for stopping and backing, and for increased speed (ChapellHASS 47). For eighteenth-century privateers, the topsail schooner was popular. The schooner rig made it weatherly and the square topsail on the foremast gave it a bit of extra drive. (132).

Each rig is most suitable for a particular range of ship lengths: sloop (14-50'), brig or brigantine (70-120'), two-masted schooner (36-130') , three-masted schooner (70-150'), and ship or bark (90-200' or more). (ChapelleYDP 118).

A fore-and-aft rigged ship needs just half (Rogers 132) or even a quarter (Gougeon 28) the crew of a square-rigged vessel, in part because it can sail closer to the wind and thus is less frequently required to change tack. Also, when it changes tack, only the headsails need to be handled. Baker (142) estimates that the necessary crew is one man for every 4-6 tons burden for a square-rigger and for every 13 tons for a fore-and-aft.

However, fore-and-aft rigged sails can be difficult to hoist, lower and reef (Gougeon 11). They are also don't scale up well, and the large ones are more vulnerable than their square counterparts to damage in vigorous wind and sea conditions. (28).

For the large ships which went on long voyages, square-rigging tended to dominate, since the skipper could pick a route to minimize upwind travel, but there was more likelihood of encountering unavoidable heavy weather. (Philips-Birt 129).

Seventeenth-Century Rigging. Prior to the seventeenth century, large ships had as many as four masts, with the two aft masts carrying single lateen sails. In the 1620s, the fourth mast (bonaventure) disappeared, and a square topsail was added above the fore-and-aft sail on the third (mizzen) mast,

creating the classic three-masted, predominantly square-rigged "ship rig" ("full rig"). (Svensson 21; AndersonRS 8). In addition, the large ships added a headsail, in the form of a small square sail (the "spritsail topsail") hanging from a spar lashed to the bowsprit. Despite its shape, it was a fore-and-aft sail (Phillips-Birt 158).

The presence of a spritsail topsail screams "seventeenth century" to a naval historian, but the seventeenth-century designers are mute when it comes to explaining why they bothered with one. Phillips-Birt (185) said that it balanced the mizzen sail. Or perhaps it balanced the effect of wind on the high stern when the latter was no longer balanced by a forecastle (Anderson 141). Or it reduced leeway created by the high side of the ship when it received a quartering wind (Svensson, 22). (I believe its purpose was to irritate naval historians.)

Staysails were first used on small craft, well before the Ring of Fire (Anderson 147). Staysails gradually appeared on large ships, beginning in the mid-seventeenth century. My sources conflict as to the order of appearance of the fore, main, foretop, maintop and mizzen staysails but I would guess they were all present by the end of the century, and the main staysail was used as a storm sail. Triangular headsails appeared in the late seventeenth century and largely replaced the spritsail by the early eighteenth. (Svensson 29; Phillips-Birt 225).

Spar Materials. The wood for masts must be straight, cylindrical, and free of knots. It also should be strong yet flexible and light. That meant the royal forester wanted conifers, preferably from a region with a short growing season. And only trees of a great length were suitable for making the main masts of the larger ships.

At the time of the Ring of Fire, the seventeenth-century European navies obtained most of their masts from Scotland, Norway and the Baltic (Williams 176). For example, "Amsterdammers are known to have exported Russian masts to Portugal in 1615." (Kotilaine 252). There was just a trickle of timber from North America to England. (Davies 194)

The traditional European mast-timber was *Pinus silvestris* (Scotch Pine; Riga Fir, Dantzic Fir, Red Deal), but the *Pinus abies* (Spruce; White Deal) and *Pinus larix* (Larch) were also available. The pines of the Eastern seaboard, notably *Pinus strobus* (Eastern White Pine; Weymouth Pine) and *Pinus palustris* (Virginia Pine), were first exported to England a few decades before the Ring of Fire. (Murray 157; Schlich 580). *Pseudotsuga menziesii* (Douglas Fir, Oregon Pine) was first encountered in western North America, and therefore didn't come into shipbuilding use until the nineteenth century.

Mast Assembly. The heels of the lower masts are "stepped" onto the keelson, a longitudinal timber above the keel, or occasionally onto a lower deck. Yes, that means that a considerable part ("howsing") of the length of the lower mast is actually out of sight.

Wooden masts could be reinforced. Prior to 1800, they were "wooldded"; wrapped with a rope nailed down on each turn. Later, iron bands were driven on while hot. (Longridge 164).

"Divided" masts are "doubled"; the heel of the mast above overlaps the head of the mast below. Originally the two were just lashed together. As the upper masts grew, a stronger scheme was needed. The mast below, at the "hounds," has side projections (cheeks) on which the butt end of the mast above rests. Also above there is the "fid," which is a bar which passes through the heel of the mast above and interlocks with the trestle trees and cross trees which support the "top" (a platform). And then above that is the cap, which has holes for both the mast above and the mast below. The body of the mast runs from the "partners" (at deck level) to the hounds, and the masthead is the part above the hounds.

A "pole mast" is one made from a single tree, whereas a "made mast" ("built" mast) is composed of several pieces of timber joined together, to increase the effective length or diameter of the mast. (While that definition would seemingly apply to a divided mast, whose sections collectively increase the length, the term "made" mast is most often used when the pieces are joined in parallel, to increase the girth.) It was not unusual for the lower topmast to be a "made" mast and the topmast and topgallant mast to be pole masts. "Made" yards were also known.

Traditional "made" masts are dovetailed, bolted, cemented (with resin), banded, and roped together to form a durable solid structure. Better glues will of course make it possible to make stronger "made" masts. (Kingston 87).

Even if there was large enough tree available to make a pole mast, its "made" mast equivalent had the advantage that one could use just the strongest parts of several trees. The disadvantage, of course, was that it required greater skill to make a "made" mast so it would resist the wind as if it were a single tree. (Douglas 140).

If the purpose were to build up the diameter, perhaps for a lower mainmast, there would be a central spindle, surrounded by side pieces, without any significant gaps. However, hollow "made" masts (or yards) are also possible.

Hollow spars. In a compressed cylinder, most of the resistance to buckling comes from the outer layers. So why not leave out the inner layers and reduce the weight? Hollow wooden spars (first yards, then masts) were introduced in the early 1800s. The first were made by carving troughs into two boards, gluing them together, and then rounding off. In the late 1800s, Herreshoff glued six staves, with trapezoidal cross-sections, to make a hexagonal cross-section. Another approach is the "box" spar, with four staves glued together. (Gougeon 65).

However, the advantage of hollow spars over natural (hence solid) spars is not as pronounced as a simple-minded application of "Euler buckling" theory would suggest. After all, trees are subject to winds, yet they don't blow down all that often. The reason is that a tree grows so that its wood is "pre-stressed"; that is, when no wind is blowing, the outside is in tension (and the core in compression). The result is that if the wind builds up, the tree experiences greater tension on the windward side, but less compression on the leeward side, than if the wood hadn't been pre-stressed. And wood can resist tension much better than compression. (Gordon 278-83).

The nineteenth century also witnessed the introduction of hollow metal spars. The *Seaforth* (1863) is reportedly the first ship with steel (as opposed to wrought iron) spars. (Anderson 194). The *Thomas W Lawson* (1902) had steel lower (135') and pine upper (58') masts (Rogers 137). Because of the effect of weight aloft on stability, twentieth-century yachts may use hollow aluminum or carbon fiber spars. Unfortunately, both are going to be a scarce material for some years after the Ring of Fire. Metal spars weren't without their disadvantages; they couldn't be repaired at sea (Phillips-Birt 204).

Placement of Masts. In the 1630s, the mainmast was generally midships or slightly further aft. And there was greater distance between mainmast and foremast, than mainmast and mizzenmast. (AndersonRS 5-9). On Chapman's eighteenth-century ships, the relative positions of the masts along the waterline length are about 14%, 58% and 85%, respectively. (Creuze 41).

On most ships, the masts are single file. However, there have been exceptions. Phillips-Birt (129) describes a junk with two side-by-side foremasts, and the *Grangesberg* (1903) had seven pairs. More recently, there has been interest in catamarans with twin masts, one per hull)(WO2003/101822).

Spar dimensions. It appears that each seventeenth-century shipwright had a rule of thumb for sizing the masts and yards, based on the keel length, maximum breadth (B) and depth of the ship. For English ships, Manwaring (1623) said that the mainmast length should be 2.4B (measured outside planking), and Miller (1655) held out for 2.5B. It is also worth looking at the 1600 and 1640 "establishments" for British warships of various sizes. Spanish and Dutch ships appeared to have somewhat longer masts, perhaps 2.67B (inside planking). (AndersonRS 15). The other masts were sized relative to the mainmast. For example, the main topmast was then about half the length of the mainmast.

The mainyard was sized with respect to the keel length, but the length/beam ratio was such that this usually worked out as 85-100% the length of the mainmast (52). The other yards were sized relative to the mainyard. The 100-gun *Sovereign of the Seas* (1637), 137'KL and 46.5'B, has a 113' mainmast and a mainyard of equal size. (Lees 192). The diameters of masts and yards is proportionate to their lengths, and they are tapered.

There is much nineteenth-century data in Fincham, *On Mastings Ships and Mast Making* (1829). Fincham's schooner tables are reproduced by ChapelleBC (179-85) and thus are very likely to be available in Grantville.

According to a very extensive 1832 comparison of the English and French navies, an English 74 (176'LOD, 48'B) had a mainmast of 108', foremast 98.5', mizzenmast 73', mainyard 96', and main topmast 64'. Its French equivalent (183'L, 49'B) had mainmast 112', foremast 103.4', mizzenmast 77.8', mainyard 98', and main topmast 69.3'. In general, for a given warship class, the French favored longer masts than did the British. (Fincham 267ff).

Raking. When the mast is inclined slightly backward, it is said to be "raked aft." It is rather difficult to be sure how common raked masts were in the early seventeenth century. AndersonRS (13) says that in *HMS Sovereign of the Seas* (1637), the foremast is vertical, the mainmast raked slightly, and the mizzenmast raked somewhat more.

One reason for raking is so that the force of the wind, acting well above the center of gravity of the ship, doesn't cause the ship to pitch forward as much. Another is that it reduces the strain on the backstays. Unfortunately, while the rake makes the ship look faster (a bit like swept wings on a jet fighter), it actually reduces the driving force. (Alston, 67; ChapelleBC 169).

Mast and Sail Co-Evolution. In theory, each mast could bear one gigantic sail. In practice, that doesn't work out well. It is easier to handle several small sails rather than one large one (Svensson 47), and, by dividing the sail area into multiple sails, it becomes possible to better adjust the sail area to the wind level (see below). If a sail is damaged, whether by the wind or a cannonball, it will tear, and it is better that one small sail be lost, with others left intact.

The square sails are named according to the mast on which they are hoisted, and their position on the mast. From bottom to top, they are course, topsail, topgallant, royal, sky, and moon.

Originally, each mast was once a single tree trunk ("whole mast"). As mast heights were increased (to carry additional sail) and forests were depleted of the tallest trees, it became difficult to find trees of adequate straightness, length, diameter and strength. Hence, "divided masts" were introduced in the fifteenth century. Initially, this was a two section mast, with lower mast and topmast lashed "permanently" together, and each section carrying one sail. Later it was made possible to lower the topmast for increased stability in stormy weather.

Of course, the demand for more sail and more mast length didn't stop there. A large seventeenth-century

ship's "mainmast" might actually be three sections (the lower mainmast, the main topmast, and the main topgallant mast), each carrying a single square sail. There were as yet no sails above the topgallant.

The royal was added in the eighteenth century; OED's first citation was from 1769 (but the sail itself is older). For the skysail, OED has an 1829 entry, and for the moonsail, 1841. Gordon (227) calls the two "an affectation of the clipper era."

The upper sails have always substantially smaller than the lower ones, but the proportions have changed over the years. "In a sail plan of about 1600, . . . the area of the main topsail is not much more than half that of the mainsail [course], and the main topgallant sail is only about one-sixth of the topsail." By the nineteenth century, the upper sails were more prominent. "In 1832 the main topsail was about one-tenth bigger than the mainsail, and the topgallant was more than one-third of the topsail." (Anderson 194).

When the royal sail was introduced, in the early eighteenth century, it hung from an upper yard on the topgallant mast. By the mid-eighteenth century, the royal sail was large enough (at least on first-raters) that a royal mast was added atop the topgallant mast, resulting in a four section mast.

Beginning in the mid-nineteenth century, a new pattern emerged. Previously, it was the topmost sail which was divided, and then the mast was divided so the upper division could be made even larger. But the new pattern was to divide the course and the topsail even though there were sails above them. This was to have the benefit of increased speed while minimizing crew requirements. (Lardas). The corresponding mast was not divided.

Initially, a light spar was attached to the middle of the new divided topsail; the upper part could be released so it would be double over the spar, which would hold up the lower part. Forbes (1841) and Howes (1853) developed two different systems for hoisting and lowering the divided topsails (Svensson 48).

In the late nineteenth century, there was a new trend; mast heights were reduced, but sails were made broader, and the ships were made longer to accommodate additional masts. The extreme example of mast proliferation was probably the *Grangesberg* (1903), 440 feet long, with seven pairs of masts. (Rogers, 152).

Sail materials. The ideal sail material would be inexpensive, light, impermeable to air, smooth, and resistant to strong winds, enemy fire, ultraviolet radiation and rot.

In the seventeenth century, the traditional sailcloth is linen, made from flax. Unfortunately, linen is stretchy (which impairs the aerodynamic performance of fore-and-aft sails) and leaky (Gougeon 31, 94). That leakage was especially problematic when the wind was weak, and the sailors would dampen the sails so they would shrink and tighten.

Hand-woven cotton sails were first used in the early nineteenth century. While they were less stretchy and leaky than linen, they were expensive. The economics changed when the power loom was introduced in the 1830s, and there was also the bonus that machine-woven cloth was tighter.

Canvas sails are perhaps 20% permeable. (GEC). Beginning in the early 1900s, sails were singed or varnished to reduce their resistance to airflow. (Gougeon 98). Twentieth-century sail fibers, which offer greater strength, and less weight and permeability, include polyester (Dacron®), nylon, aramids (Kevlar®), polyethylenes (Spectra®), and carbon fiber.

Sail Construction. Sails aren't made of a single cloth. In the late seventeenth century, William Penn (of

Pennsylvania fame) and William Bolton persuaded the British Admiralty that it was better to use narrow cloths, and hence many seams, to minimize stretch. (Phillips-Birt 267).

The sails actually varied in weight; you used a heavy sail in a storm and a light sail when the air was barely moving. The Admiralty #4 canvas, which would be used for topgallant sails (Kipping 68), weighed 36 pounds per bolt (2' x 117') (EB11/Sailcloth).

Look closely at sailcloth and you see that it is a grid, with the warp threads being those which originally ran with the roll, and the weft threads crossing them perpendicularly. It resists a pull parallel to the warp or weft threads, but yields when the pull is on the diagonal.

Unfortunately, prior to the nineteenth century, sails were constructed so that the sails were pulled obliquely to the grid, and therefore stretched . . . reducing their crosswind and upwind performance because they couldn't be given the right shape. (Gordon 251-5).

"Ripstops"—reinforcement threads, arranged in a cross-hatch pattern spaced 5-8 mm apart—came into common use in World War II, in nylon parachutes. The ripstop concept can be applied to other fabrics, including cotton.

Fore-and-Aft Sail Shape. Much ingenuity has been devoted in this century to improving and maintaining the airfoil shape. You want the sail to bulge near the leading edge, and flatten at the trailing edge. Short horizontal battens running inward from the trailing edge can be used to stiffen the latter, making it stay flatter. Or you can use full-length battens, which vary in thickness so that, when compressed at the ends, they form a good airfoil shape. (Gougeon 97).

Just to complicate matters, for smooth airflow, you want a deep airfoil at low wind speed and a shallow one at high speed. So you want to regulate the curvature of the sail. On yachts, the lower part of the sail can be flattened by an "outhaul" and the upper part by a bending mast (112-9).

Square Sail Shape. Seventeenth-century sails were "baggy," so the wind must be at least three compass points (34°) behind the sail for it to fill properly. The efficiency of the "flat cut" sail wasn't generally appreciated until the *America*'s 1851 triumph. (Harland 60).

Sail Area. There are great differences in sail area among ships, from small craft, like the 30-ton pinnace *Virginia* (1607) with 1130 ft² canvas (BakerCV 60), to the 11000-ton *Preussen*'s 60,000 (Villiers 1) and the ill-fated megaclipper *Great Republic*'s initial 144,000 (Rogers 124). A post-Napoleonic "first rate" warship would probably carry about 30,000 ft² (Fincham 251, 267ff).

The greater the sail area, the greater the amount of wind energy which can be captured and used to propel the ship. There are really only three ways to increase sail area:

- vertically, make the masts taller and have them carry either taller sails or more sails
- horizontally, make the yards and thus the sails wider, or stick additional sails out on booms
- longitudinally, add more masts, each carrying sails.

Vertical expansion had certain advantages. Because of wind shear, wind speed increases with height; at 100 feet it is likely to be about 40% stronger than at ten feet (Raskin). A French 120-gun warship (1832) had a mainmast 130' long (Fincham 267ff).

Unfortunately, the vertical expansion of sail area is limited by the strength of the available spars. It's also more difficult to handle (that is, raise, trim, reduce or lower) a sail that's 100 feet above the deck than one closer to the surface. It takes time to ascend to the sail's level, and the ship's pitch and roll will be more disturbing. Of course, machinery could alleviate this problem, but it would increase weight aloft.

Moreover, lengthening the masts delivers a triple punch to ship stability. First, the "center of effort" of the sails is higher, which means the wind is acting at the end of a longer lever arm, and increasing the tendency of the ship to pitch and heel in response. Typically, for a ship- or bark-rig, the height of the "center of effort" of the sails above the water was 1.5-2 times the vessel's breadth. (White77, 495). For the 110-gun *Queen* (1839), 59' breadth, the COE was 91' above the waves (Fincham 251).

Second, if the yards are unchanged, the sail area is presumably greater than if the mast were kept short.

Third, the more weight there is aloft, and the higher up it is located, the higher is the center of gravity of the ship, and the less the stability. If you add ballast to neutralize the effect on stability, then you have further increased the mass of the ship, and will probably also need to increase its displacement to compensate. The net result could be a lower maximum speed. Concerned with stability, Bougier (1746) urged that the mast be shortened "prodigiously," while making the yards longer to compensate. (Monceau Supplement 26).

Horizontal expansion is limited by the strength of the yards. Moreover, wide yards cause more "blanketing" of sails further forward, and are harder to turn quickly if the wind shifts.

The longitudinal expansion is limited by the same factors which limit the length of the hull (see part 2). In addition, for a given length of hull, there are limits to how many masts you can squeeze on without the yards fouling each other (Longridge 156), the aft sails shadowing those ahead, the hull hogging under the concentrated weight of the masts, etc.

In general, I believe that in the new time line, horizontal and longitudinal expansion (facilitated by iron) will be favored over vertical expansion.

The types of sail carried also affected the sail area available. Chappelle comments, "no rig of the fore-and-aft variety could be made to stand if it contained the same area of sail as the square rig." (ChappelleHASS 47).

Adjusting Sail. When in light air, the crew will hoist every scrap of canvas that might catch some wind. A peculiar seventeenth-century practice for increasing sail was bonneting. This was lacing an extra piece of canvas (the bonnet) to the foot of an existing sail, usually the fore and maincourses, the mizzen, and perhaps the spritsail. The bonnet was usually one third the area of the main body of the sail. A large ship might have another piece, a drabblor, lashed below the bonnet of the courses, and one third the bonnet's area. (BakerNM 114).

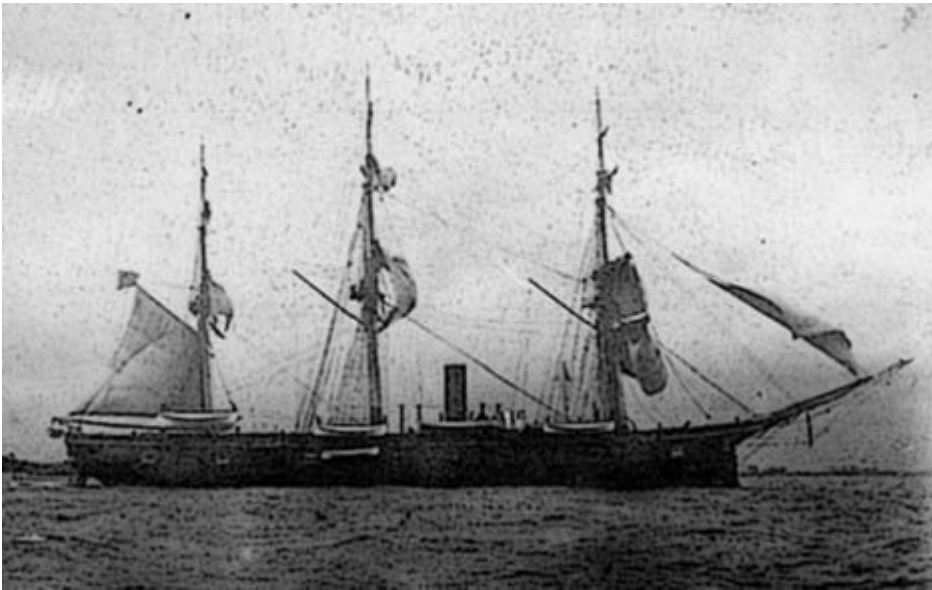
It was also possible to rig a spar onto an existing yard, to hang a sail over the side of the ship. These "studding sails" were introduced in the sixteenth century (Phillips-Birt 201), but weren't really common until the nineteenth. (Svensson 29, 43).

When winds increase in force it becomes dangerous to maintain full sail. The sail may be ripped or blown away, and the mast can be carried along with it. If the sails remain intact, the force of the wind could also force the ship to pitch or roll to a dangerous degree. Hence, it is necessary to be able to reduce sail quickly and efficiently.

Your basic choices were to take down the sail, furl the sail (roll or gather it up on its yard) or to reduce its area in some way.

In the early seventeenth century, you would first furl the topsails, which were considered light sails, then remove the drabblers and bonnets from the lower sails, and finally proceed under just the forecourse.

Reefing was another method of reducing the area of the sail. A square sail would carry one or more horizontal reef bands, essentially a strong strips of canvas sewn on both sides of the sail proper. Each reef band bore a row of reef points (cords) and corresponding eyelets. The reef points passed through the sail and were knotted so one end hung ahead and the other behind the sail. If a sail was to be reefed, the appropriate reef band was pulled up close to the yard, and the ends of each reef point were crossed over it, and knotted. There were a number of variations on the theme (Harland 139).



The history of reefing is a minor nautical mystery. We know that reef-points were in use from the thirteenth century to the beginning of the sixteenth century, but that they vanished for a century, reappearing around 1660. First topsails, and by the end of the seventeenth century, also the courses, could be reefed. (Anderson 146). Thereafter the bonnet fell into disuse (it being faster to tie reefs than to untie bonnets). (Id.). The 1631 Ring of Fire occurred during the Reefless Interregnum. However, in my story "Stretching Out, Part 4: Beyond the Line," reefing is installed on a ship which leaves Hamburg in December 1633. So the up-timers have already had an impact on sailing ship design.

Once reefing was rediscovered, it became customary to first furl the lower sails, then reef the topsails. (BakerNM 114; Phillips-Birt 227). The number of rows of reef points in the topsails increased from one (1650s) to two (1680s) and then to four (eighteenth century). When the divided topsail was introduced, the number of rows dropped down to one or two again. (Mondfeld 260).

Beaufort proposed, not only a wind scale, but a matching policy for adjusting sail: carrying full sail (including royals) in a fresh breeze (force 5, 16 knots), single-reefed topsails and topgallant sails in a strong breeze (force 6, 22 knots), double-reefed topsails in a moderate gale (force 7, 28 knots), triple-reefed topsails in a fresh gale (force 8, 34 knots), close-reefed topsails and courses in a strong gale (force 9, 41 knots), close-reefed maintopsail and reefed foresail in a whole gale (force 10, 48 knots), storm-staysails in a storm (force 11, knots), and no canvas at all in a hurricane (force 12, 64 knots). These guidelines were adopted by the Admiralty in 1838. (Raper 133).

Ships also reduced sail before going into battle, as most of the crew was needed to serve the guns. Typically, the courses would be clewed up (lower corners raised), and the principal "fighting sails" were the topsails and jib (Coggins 731). Smith's *Seaman's Grammar* (1627) refers to a chase stripping himself to "fighting sails."

The divided topsails of Forbes and Howes could be shortened quickly; in Howes' system, the upper sail fell in front of the lower sail when the halyards were released. In the nineteenth century, mechanical reefing and furling systems were developed. In Cunningham's roller reefing (1850), the yard rotated to wrap up (and thus shorten) the sail.

Sail Blanketing. One sail can prevent the wind from reaching another. Sail interference will be at its worst when the ship is running with the wind, and when reaching, it can be reduced by bracing more directly. But it's quite evident from the discussion of spar dimensions and mast placement that the masts are so close together, and the lower yards so wide, that the main course is surely going to "shadow" (block wind from) the fore course no matter what the brace angle, and that there will be a lesser degree of shadowing of other foresails by mainsails, and mainsails by mizzensails.

The shadow isn't absolute; the aft sails will let some air through, and the air can swirl around one sail and nudge against another. But the overall effect of permeability and shadowing is probably to reduce overall sail efficiency to something like 50% of the nominal sail area. (Lindmark).

Metal hulls will allow building longer ships, and thus increasing separation between masts.

Just to complicate matters, the interaction between two sails can be favorable; wind funneled in the "slot" between the sails and increasing lift.

Cordage. The cordage was hemp until the 1850s and 1860s, when it was gradually replaced with wire-rope (Anderson 193-4; Phillips-Birt 269). The problem with hemp was that it stretched, creating an unsteady rig. Phillips-Birt asserts that wire rigging was critical to the performance of the nineteenth-century tea clippers. Corrosion-resistant stainless steel wire was introduced in the early 1900s. Nelson's flagship, *HMS Victory*, had 26 miles of cordage. (Victory).

Rigging Strength. The wind presses on the sails, thereby applying a force to the yards and masts. Masts are tall and thin, and it wouldn't take a lot of wind to knock the masts over, or bend them to the breaking point, if they weren't stabilized by the standing rigging. The latter causes the sideward wind force to be redirected down the mast; masts are made to resist such compression.

Masts usually fail by buckling. The center of a mast does not contribute much to buckling resistance so you may want to replace solid masts with hollow ones. You can either use larger diameter hollow masts of the same weight (for more resistance) or the same diameter hollow masts (for less weight aloft). (Gougeon 63).

On a square-rigged mast, all the stays run behind, so they can pull to counter the forward push of the wind. If the wind swings about to strike the front of the sail, then an aerodynamic jujitsu ensues; the stays help the wind knock down the mast.

Standing Rigging. The purpose of standing rigging is to relieve the stress on the masts and yards created by wind force. The mast is stabilized by stays: forestays in front, backstays behind, and "shrouds" on either side. For a mast bearing square-rigged sails, the backstays are of particular importance, because the wind tries to bend the mast forward. Each mast bears at least one pair of backstays; these run aft and to the sides of the ship. The forestays run directly forward.

An unstayed mast will bend in response to the wind. When that happens, it compresses on the leeward side and stretches on the windward. Wood is weak in compression and hence an unstayed wooden mast must be pretty thick or it will rupture. (Doubling the diameter increases the maximum load eightfold. Carbon fiber is about 27 times stronger than Douglas Fir, so an unstayed carbon fiber mast can be one-third the diameter of a fir one.)

If stays are attached to the mast, then instead of the mast bending, the stay is stretched, and the mast is axially compressed. In effect, instead of the mast bearing the entire force of the wind, some is now borne by the stays.

The stays, ideally, are made of material with a high tensile strength (stretch resistance). The same tensile load can be withstood by, say, a 6 mm wire, a 14 mm modern rope, or a 40 mm natural rope. (Classic Marine)

You also try to have as big a "staying angle" (the angle between the stay and the mast) as possible, because that minimizes the tension on the stay. For forestays and backstays on a large ship, that isn't hard (the bowsprit in front and the bumpkin in back help). However, it is harder to attach the shrouds so as to achieve a favorable staying angle, especially on a narrow-beamed ship. The trick was to attach the lower end of the shrouds to projections (chainwales, channels) hanging outside the ship's hull. They are mentioned in John Smith's 1627 *Sea Grammar* (228). Modern yachts use spreaders.

A stayed mast, being axially compressed, tends to fail by buckling. Double the length of a column and the load required to buckle it is only one-quarter. So, even with stays, there is still incentive to reduce the length of masts.

The buckling load also depends on the "fixity" of the ends—that is, are the ends restrained from moving and from rotating. In the seventeenth century, it was customary to fix masts at both deck and keel, which creates a fixed end and increased the allowable buckling load. (The catch is that if the clamping is out of alignment, the mast is bent and the allowable load is reduced.)(Gordon 286-90).

For fore-and-aft sails, the standing rigging used to be attached to the top of the mast, because the sails were attached to loose-fitting hoops that slid up and down the mast. By 1910, yachts were using "sail track." The sails were equipped with slides that could engage a rail fastened to the aft side of the mast (or a groove integral to the mast). Sail track made it possible to attach stays to lower points on the mast, or to spreaders (crossarms) on the mast, and thereby distribute the wind load. And that meant that masts could be made lighter. (Gougeon 60-1; Lehar).

The introduction of metal spars will make possible a reversion to the pole mast. This could be combined with sail track so that some sails could be raised and lowered from the deck.

Running Rigging. This controls the shape, orientation, and size of the sails. The ropes used actually vary depending on the type of sail. Generally speaking, halyards ("haul yards") and downhauls are used to hoist up or lower the yards. Slings and trusses attach them to the mast. Braces turn the yards and lifts tilt them. The head (upper edge) of the sail is "bent" (hung) on a jackstay which runs along the top of the yard. Sheets attach the lower corners (clews) of the upper square sails to the yard below. Clewlines, leechlines and buntlines are used to pull the sail back up to the yard, preparatory to furling it. Bowlines hold tight the windward edge of the sail when the ship is sailing close-hauled.

Bear in mind that considerable force might be needed to manipulate the yards. The 82' long, 22" diameter main yard of the clipper *Flying Cloud*, when carrying sail, weighed over two tons. (Shaw 35,

180).

Machines could be used to assist with the arduous task of operating the running rigging. The capstan (vertical barrel) or windlass (horizontal barrel) was the principal machine on the ship. The *HMS Victory* could put a hundred men on the capstan bars, and pretty much lift anything that way (Longridge 63). The sailors pushed on the capstan bars (levers), and this drew a rope or chain wrapped around the barrel. The ship also had several winches, used for smaller jobs. A winch is really a windlass equipped with a crank in place of a bar.

In the nineteenth century, steam winches were introduced; the *Great Republic* (1853) had a fifteen-horsepower steam engine to hoist sails, etc. (McCutchan 38; Rogers 137).

Weight of Rigging. The thirty gun French frigate *Renommée* (1744) carried 40,000 pounds of masts; 6,444, of blocks; 24,444, of cables and hawsers; 7,998, of sails and cases; and 17,282, of cordage, totaling about 89,000 pounds rigging, including spares. In contrast, its hull weighed 701,388 pounds, and the load displacement was 1,571,556 pounds. (Monceau 50). An English "74" (1832) bore 260 tons rigging; its load displacement was 3043 tons. (Fincham 267, 272). So rigging is 5-10% displacement on warships.

Bracing. Bracing is turning a yard to more directly face the wind. Because of the standing rigging, the yards bearing the courses couldn't be turned closer to broadside than about 27-30° (White 509). Harlan says three points (34°); together with the three points needed to fill the sail, that explains why the square-rigged ship couldn't be sailed closer than six points of the wind.) The spread of the rigging for the upper sails was less, and hence they could be turned more sharply, each perhaps half a point more than the sail below it. A fore-and-aft rigged sail could brace its yard more sharply (White says 13-17°, Harland one point) of the keel line, and hence a fore-and-aft rigged ship could sail as close as four points to the wind.

It is possible to alter how the standing rigging is arranged in order to make sharper bracing possible. A ship in the "Experimental Squadron" (1827) could brace to 19°, and there is a modern "mainmast barkentine" (*Pelican*) which achieved a similar result by leading the backstays further aft, and lowering the attachment point of the main forestay. (Goode).

The bracing angle is actually a compromise between maximizing the force on the sail and minimizing leeway. "Modern" practice is that if you are sailing close-hauled, you brace as sharply as possible, but otherwise the yard is positioned so as to bisect the angle between the wind and the bow. Thus, for a beam wind, the yards would be braced to 45°. (Harland 62).

Bipod and Tripod Masts. The demand for standing rigging can be reduced by strengthening the mast. Simply increasing the diameter of the mast is one approach. However, the ancient Egyptians used an "A-frame" style bipod mast, which of course increased the lateral stability of the mast, without the need for shrouds (Philips-Birt 25). Of course, it also increased the weight aloft. A carbon fiber bipod mast has been used recently on a catamaran to support a fore-and-aft crab claw sail. (Seluga). An advantage of the bipod support is that the effect of the mast on wind flow over the sail is reduced.

Tripod masts are also ancient (41), and may well have been used by Asian seafarers in seventeenth century. What is certain is that in the early nineteenth century the Samal of Mindanao (Philippines) had oared gunboats (garays) with a single unstayed tripod mast carrying a large quadrilateral sail. These could sail much closer to the wind than a conventional square-rigger. (Francis 245-7). The *paduakans* of Indonesia were small merchant ships (up to fifty tons) with a tripod mast and a lateen sail. (St. John 184).

The British Navy equipped the ill-fated *HMS Captain* (1869) with revolving turrets, and since the ship carried 50,000 square feet of sail, it had three tripod masts. These minimized standing rigging, and thus maximized the arcs of fire. Unfortunately, they also would have increased the weight aloft, and this (and the large sail area) probably contributed to its capsizing in 1870. (Gordon 228-9; Wikipedia).

Junk (slatted lug) sails. The Chinese had a unique solution to the problems of dividing the sail area for easy handling, and of reducing sail. The junk sail was somewhat like a giant Venetian blind with rectangular fabric panels, connected along their long edges by wooden, slightly inclined slats (battens). Stays, if present at all, run only from the top, so they didn't interfere with the movement of the slats (The sail may therefore be turned almost ninety degrees). The sail was positioned across the mast (like a Western lug sail), with about one-quarter of the sail area forward of the mast, three-quarters behind.

The Chinese sails could be hung on stayless masts because the Chinese are willing to tolerate the bulging of the sail cloth between the battens when the wind is strong. Indeed, they may deliberately relax the canvas so that the mast isn't blown down. (Gordon 123-6). The mast is flexible.

On junk sails, the battens (which are functionally equivalent to Western yards) are made of bamboo. Western yachtsmen who have experimented with junk sails have tried fiberglass and ABS pipe. (Kasten).

The junksail could easily be shortened or even hauled in much like an upside-down Venetian blind, without sending topmen aloft. It is also self-tacking and self-jibing (the running rigging doesn't need to be adjusted). Thus, it is a very labor-efficient rig.

The junk has good performance in light air, and also has a high factor of safety in heavy weather because of the lack of stressed stays. It runs and reaches well. The junk's main disadvantage is that it's not as efficient as a modern Bermuda rig when clawing to windward. (Frankel 216).

Gougeon provocatively says, "one wonders if a clipper hull, had it been fitted with junk-type sails, could have been even faster. It almost certainly could have been manned by about a third of the crew required for the Western-type rig." (19).

Tops. The tops, which were just above the "hounds" of the lower masts, had three purposes; they were useful workplaces for the sailors aloft; they made it possible to increase the "staying angle" for the shrouds; and they were firing platforms for marine snipers. Tops existed in the seventeenth century; they are mentioned by John Smith.

The tops are surprisingly big. In the early nineteenth century, the main top's width was one third the length of the main topmast, and its length was three-quarters its width. For the *HMS Victory*, that worked out as 23'6" by 17'6". The fore top was almost as large, and the mizzen top about 70% the size of the main top. (Longridge 171).

Mast shape. In small fore-and-aft-rigged ships, the aerodynamic characteristics of the mast are important; a mast with a gaff sail is the leading edge of the airfoil. It is now customary for the masts to be streamlined. (Gougeon 66), and it is even possible on some ships to rotate the mast so the "teardrop" remains aligned with the sail. If the mast is elongated fore-and-aft, you get a "wing mast," which on some yachts is as much as 40% of the "sail" area. (98-9, 106).

Hard Sails

Periodically, alternatives to the traditional soft sail have been considered. Here, we will take a look at wing, kite and windmill sails.

Wing Sails. The classic fore-and-aft sail is flexible, and its shape is a function of how it is attached to the spars, and the speed and direction of the wind. It is possible to construct a sail which is rigid, so it has a fixed airfoil shape. Imagine an airplane wing stuck on deck so its tip points upward and the front of the wing faces forward. What would become vertical lift on an airplane wing is forward "lift" on a wing sail. The sail is rotatable to get the best angle of attack on the wind, and will also have a trailing flap which can be adjusted to produce more lift. The wing sail can be seen as the extreme development of the wing mast, in which the "cloth" sail is dispensed with.

Since tacking can put the wind on either side of the sail, either the wing sail must have a symmetrical profile (unlike an aircraft), or there must be a means, such as a movable batten structure (USP4624203), for reversing the profile after a tack.

The effective "airfoil thickness" of a classical sail is its "billow," and is small but variable. A thick wing sail gives more lift than a classical thin sail if the "Reynolds number" for the sail is higher than 60-120,000. The longer the sail (parallel to the wind), and the faster the wind, the higher the Reynolds number, and it's 140,000 for a 1 meter sail in a 2 meter/second wind. It's fairly typical for wing sails to have double the lift of a thin sail. (Raskin).

You wouldn't use a solid sail anymore than you would a solid mast; the interior doesn't have an aerodynamic effect and its contribution to bending resistance is small. But even if the wing sail were hollow, it would have a high ratio of weight to area if the surface were completely made of wood or metal. So, we have two choices. We can wait until glass- or carbon fiber-reinforced plastics are available, or we can compromise and stretch a fabric across a scaffolding which approximates the desired shape.

Most ships with wing sails are small racers; indeed, they dominate the international C-class catamaran (300sf sail area) championships (Killing). However, there have been a couple of recent commercial vessels built to test the concept: the 1980 *Shin Aitoku Maru* (236 foot tanker; 1600 deadweight tonnes; 40 by 26 foot sails; 12 knot maximum speed) (Time) and the 1985 *Usuki Pioneer* (26,000 deadweight tonnes). The latter actually has a hybrid sail; a rigid sail with a soft sail attached by a boom (Fujiwara). Despite lower fuel consumption, freight costs actually were higher than for a conventional powered ship, so these commercial wing sails didn't catch on (Cavendish 2013; O'Rourke).

Kite sails A kite sail is attached by cables to the ship, and pulls it along, most likely from the bow. The principal advantages of the kite sail over a conventional sail are 1) masts are eliminated, 2) heeling movement (the force acting to tilt the ship laterally) is reduced (because the kite is tethered at deck level), 3) the wind speed at kite altitude (150m) is significantly greater (~25%) and more stable than at ship level (10m), 4) interference of the kite control lines with cargo handling, or cannon fire, is minimal compared to the effect of a conventional sailing ship's rigging.

Chinese kites were brought to Europe in the late sixteenth century, and our buddy Athanasius Kircher showed some interest in them (Needham 281). There was a brief flurry of experimentation with kite sails by an early nineteenth-century preacher, George Pocock. He used kites to tow a carriage (1828), making a speed of 25 mph, and even a yacht in Bristol Channel. (Weldgren).



Kite sails are still quite experimental, but in 2008 the M/V Beluga Skysails made a 12,000 mile round trip using a computer-controlled 160 square meter towing kite, deployed at an altitude of 100-300 meters, to save about 10-15% in fuel cost. Its kite sail is supposed to operate at winds of Beaufort Force 3-8, and it can tow the ship as close as 50 degrees to the upwind direction. (Skysails).

To make use of kite sails, we would need to develop a kite, a tether, and means for launch, control and recovery. It's critical to minimize the weight per unit sail area and tether length. The lower that weight, the lighter the wind the kite can stay aloft in.

The parafoil kite (invented 1963) is a soft kite made of a strong, light, stiff material (e.g., nylon) and inflated into an airfoil shape by the wind. Unit weight for modern parafoils is 0.01 psf, so they can make do with 2 knots wind.

The semi-rigid kite is "fabric" (fiber-reinforced polyester film) stretched over ribs, and is inflated with a buoyant gas. In the old time line that was compressed helium, but in the 1632 universe it is more likely to be hydrogen. Unit weight is 0.1 psf and the necessary wind is 5 knots.

The rigid kite has a continuous hard surface similar to the wings of an unmanned aerial vehicle, like the Predator; the Golden Hawk UAV uses carbon composite. Unit weight is 1 psf; 15 knots wind is needed. However, the rigid kite offers the best lift-to-drag ratio.(Roesler).

I can also imagine balloon-kite combinations, in which a kite is suspended from a helium or hydrogen balloon, allowing the kite to be launched even when there is no ground wind.

We also have to worry about the weight of the tether and control lines, per unit length, and their tensile strength. Modern kite sails are tethered and controlled by lines made of high tech material such as KEVLAR aramid or SPECTRA ultra high molecular weight polyethylene fiber. These have tensile strengths perhaps ten times that of steel, and less than one-fifth the weight.

Of course, those materials won't be available for a long time. Silk is available, and compares respectably with steel, but it's a luxury fiber. It is possible that within a few years we could use copper or steel wire; we want steel wire for standing rigging anyway. Nylon is something our chemists are making progress toward. Some sort of crude carbon fiber is also possible.

In modern kite sail systems, deployment, control and retrieval are automated. The power developed by the kite can be increased (perhaps doubled) by "flying patterns," such as figure-8s, under the command of an autopilot. In the 1632 universe, we would probably have to make do with manual control. But of course conventional sailing ships need to adjust their sails in a variety of ways.

Windmill Ships. Why would you put a windmill on a ship? The general idea, at least initially, was so that

the ship could sail directly upwind. The windmill (more precisely, wind turbine) would face the wind, the wind would cause the blades to rotate about the hub, and through gearing, this would turn a propeller.



The idea is a fairly old one; I found an issue of *The Mechanic's Magazine* ridiculing an 1836 British patent as a "mere transposition of a common wind-mill from land to ship-board, and the substitution of paddle-wheels for millstones." It added that it was "not the first by some score, of such plans. . . ." Of course, the modern wind turbine is quite a bit more efficient than even an early nineteenth-century windmill.

The upwind sailing advantage is perhaps not very important. While a sailing ship can't sail directly against the wind, one zigzagging at 45 degree tacks off the wind is still probably going to make better speed to windward than a windmill ship. At least, that's been the experience with the few prototypes; Bose's *Falcon* (1986) made five knots in a fifteen knot wind; and Bates' *Te Waka* (1980) did seven in a fourteen knotter. (Sinclair).

The theoretical power developed by a wind turbine is proportional to the area swept out by the blades (not merely the total blade area) and the cube of the wind speed. The maximum efficiency is 59% (Betz' law). This is further reduced by friction at the hub, or in the transmission system, to 40-50% for a modern rotor.

There are several design parameters for the wind turbine: the number, length, width and shape of the blades, the pitch of the blades relative to the swept area, the angle of the blade axis relative to the hub mast, the angle of the hub mast relative to the deck, and the distance of the hub from the base along the mast. A two-bladed turbine is a bad idea as the forces vary sharply as the blades turn, so I would say that at least three blades is desirable. The main reason to increase the number of blades further is so that the turbine can catch a light wind, but the problem is that the maximum thrust will be reduced.

Twentieth-century materials technology (aluminum; glass or carbon fiber reinforced composites) has made possible longer, thinner and lighter blades, with less drag, but of course the 1632 universe options will initially be more limited.

It has been argued that the equivalent of reefing (taking in sail) in a wind turbine ship is easier and faster than on a conventional sailship; you can change the pitch of the blades. That presumes having some electromechanical linkage to accomplish this.

It's important to recognize that those seeking to exploit kite and windmill sail technologies in the 1632 universe will not have the usual advantage of knowing, at least in broad terms, what works and what doesn't. And they will have the usual disadvantage of a more primitive infrastructure; you can't just order a delivery of carbon fiber to your door. But a story could have these technologies touted by a crackpot or a con artist, and, who knows, perhaps some author will know how to make them work.

Hybrid Propulsion

From time to time, sailing ships have been equipped with an auxiliary propulsion system so they could make way even in a calm. In the sixteenth-century Mediterranean, there were "brigantines" with two masts and 30-34 oars, and "frigates" with single mast, and a smaller number of oars (Maxwell, 92). Oarsmen could be placed on the upper deck, above the gun deck, or on the gundeck in-between the cannon. The standard sail was the lateen.

The oar-sail hybrids survived longest in the Mediterranean, the Black Sea, and the Baltic. Peter the Great built them in 1694 to use against the Turks, and in 1703 to attack the Swedes. The Swedes returned the favor. Throughout the eighteenth century, both the Russians and the Swedes found them useful in shallow, heavily shoaled waters off the coast of Finland. (Anderson 175).

Unfortunately, oar power requires a large crew, and is short on stamina. A more modern form of auxiliary propulsion is the steam engine. The auxiliary steam engine could also be harnessed for purposes other than propulsion, i.e., operating rigging or moving cargo.

Of course, the engine and fuel add to construction and operating costs, they take up space which otherwise might be devoted to cargo or armament (although coal acts as a form of armor), they also add to the weight of the ship and therefore reduce its acceleration), and they alter the sailing qualities of the ship. In the latter regard, the screw propeller was usually deemed better than a paddle wheel.

At the other extreme we have steamships (or motorships) with auxiliary sail, such as the kite sails discussed above. There, the purpose of the sail is to reduce fuel consumption, wind power being free. Of course, the rigging has to be carried the whole voyage, whether used or not, and this has an energy cost. And if it couldn't be put in the hold during steam operations, then it would be increasing windage when heading upwind, and reducing stability (by virtue of the weight aloft) that a pure steamship could avoid.

* * *

I close this part with some suggestions as to when various innovations in rigging might be introduced. Please don't make the mistake of putting them all on one ship!

Proposed Rigging Timeline		
Prototype Introduction	Category	Innovations
1633-35	Uses Traditional Rigging Materials in New Way	<ul style="list-style-type: none"> —staysails on large ships —reefing sails —dividing sails (two yards on same mast unit) —royals —narrower <u>sailcloths</u>, better orientation —<u>ripstops</u> in sails —hollow wooden spars —<u>unstayed</u> tripod masts (maybe) —aerodynamically shaped spars —Chinese lug sails (see below)
1634-37	Requires Cheaper/More Abundant Supply of Down-Time Material; Consistent with 19c Practice	<ul style="list-style-type: none"> —machine-woven cotton sails —hollow wrought iron or steel spars —longer ships (iron or composite) with five or more relatively short masts —wire rope standing rigging —steam winches —steam/sail hybrids —sail handling mechanisms (roller reefing, sail track, etc.) —wing sails (fabric over wood scaffold) (within 19c capabilities)
late 1630s and beyond	Requires 20c Material	<ul style="list-style-type: none"> —artificial fabric sails (need organic chemical industry) —aluminum spars (need bauxite, <u>cryolite</u>, electricity) —carbon fiber spars —wing sails (GRP)
???	Speculative Tech	<ul style="list-style-type: none"> —windmill sails —kite sails

May the wind take you where you wish to go.

THE END

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