STEAMPUNK MAGAZINE

long live steampunk!

[Lifestyle, Mad Science, Theory & Fiction]

#5

I don't know the key to success, but the key to failure is trying to please everybody.

–Bill Cosby

You want steampunk to be a novelty, a LOLcat, a meme. I want it to be my life. Which of us is going to fight harder for it?

–Dimitri Markotin

The cover was illustrated by Fabiola Garza.

Dear Reader,

Long thought to be lost in the post, it is with great pleasure that I welcome you, dear reader, to the fifth issue of Steampunk Magazine.

Much has changed in the twelve months that have passed since our last issue, and it would be foolish of us not to attempt to address at least some of those changes. The last year has seen our culture exposed to an ever-increasing tide of scrutiny and popularity. With articles turning up everywhere from Newsweek to MTV, steampunk has attracted more and more attention from people who make it their business to keep up with the latest trends and fashions, as well as from those people who would seek to commercialise us – producing aviator caps and goggles for a few pennies far abroad and selling them back to us in high street stores.

It is unavoidable that many of us will see this increased popularity and attention as an incursion, a threat to those of us who dared to be airship pirates (or anarchist ink-devils, alchemists and spiritualists, adventurers and inventors of great and terrible machines) long before such things became commonplace.

Indeed, it would be easy for us to see the increased attention as something which compromises the unique set of beliefs and aesthetics by which we steampunks define ourselves. However, it is important for us to remember that many of the people who are now discovering our way of life may be attracted by our cogs and Tesla coils, but may find a home for themselves in the earnest dedication that we show to our values, whatever those values may be.

So it is true, then, that many things have changed since we released issue four, and Steampunk Magazine itself has not been immune from those changes. However, we would like to take the opportunity to reassure you, that we here at SPM fully intend to remain committed to putting the punk back into steampunk, while at the same time offering articles and stories to delight and entertain all.

That said, we could not do any of those things were it not for the continued support of you, our readers. So here's to each and every one of us in all our varied creeds and colours, and with all our beautifully conflicting beliefs and opinions. Long may it last! And long live steampunk!

–C. Allegra Hawksmoor

Contents

direct any letters to COLLECTIVE@STEAMPUNKMAGAZINE.COM
letters may be trimmed for space reasons and/or edited slightly for "proper" grammar.

Correspondence

on electrical safety

I WAS VERY PLEASED TO DISCOVER YOUR WEBSITE. I'm fascinated by the (sometimes) inefficient but marvelous creations of "steampunkery" ever since seeing the film "Brazil", albeit that may be a different flavor. I've even dabbled in Second Life to play around with the steampunk toys people make.

In the section labeled "Build your Own Jacob's Ladder", I would like to point out a possible FATAL encounter that your readers may experience. VAC was mentioned in looking for a capacitor. "VAC" when marked on a capacitor is usually "Volt-Amps Capacitance" and not "Volts AC"

HTTP://EN.WIKIPEDIA.ORG/WIKI/CAPACITANCE

HTTP://EN.WIKIPEDIA.ORG/WIKI/CAPACITORS

It should be noted that any current put to a capacitor can be stored for (what can be calculated) for a period of time. Touching a capacitor before that time can and may cause death by heart fibrillation.

HTTP://EN.WIKIPEDIA.ORG/WIKI/ELECTRIC_SHOCK

Warmest regards, and thank you for such a creation.

–X. Ordous

RESPONSE FROM PROF. OFFLOGIC, THE AUTHOR of the article in question: I will in no way argue against any electrical safety precautions. There are many good reasons the article featured a banner reading "You are warned! You are warned! You are warned!".

(Full disclosure: I am not a doctor, but electrical shocks do run in my family: my father was electrocuted via an aluminum ladder contacting a feeder line; my uncle was struck by lightning and had all his filling melt, and electronic watches still die when he wears them; my great-uncle was an electrician that routinely tested light sockets with his fingers).

The electrical "killing factor" is current density through the right atrium of the heart. Any flow of current through the body that causes a sufficient flow of current in that section of the heart could induce fatal ventricular fibrillation (or ViFib). As regards AC (alternating current, like from one of those sexy lamp sockets):

> "In general, for limb contact electrical shocks, accepted rules of thumb are: 1-5 mA is the level of perception; 10 mA is the level where pain is sensed; at 100 mA severe muscular contraction occurs, and at 100-300 mA electrocution occurs. Keep in mind that those figures are approximate, and are not to be taken as guidelines to approximate 'assumed risk'. Death can occur under certain circumstances with considerably lower levels of current. For example, when you have been sweating or are standing in salt water, all bets are off. In medical situations, the level of current that can kill is considered to be in the 20-150 microampere level, because the current is induced directly into the body".
>
> "Safety For Electronic Hobbyist", Joseph J. Carr, Popular Electronics, Oct. 1997
>
> HTTP://YARCHIVE.NET/MED/ELECTROCUTION.HTML

At 120 volts, the capacitor could carry (assuming you disconnected it from the circuit at the very peak of the AC sine wave) a total energy of approximately .338 x 10^{-1} Joule. For the UK and points east, it's closer to 1J, due to higher voltage (see HTTP://HYPERPHYSICS.PHY-ASTR.GSU.EDU/HBASE/ELECTRIC/CAPENG.HTML#C1). One joule is equal to 0.2391 calorie (defined as the amount of energy required to raise the temperature of one gram of water one degree Celsius at 20°C), so this is basically one metric dog fart (best case).

If discharged through the oft-cited 500-20,000Ω skin resistance, you'd get a single pulse (.00235 to.094 seconds) of between 6 and 240 mA. These are fairly optimistic figures, though: my own body's skin resistance between dry hands with firm skin contact measures about 500,000Ω; across my saliva moistened palm (the left one) it's closer to the 20,000Ω level. These figures would give a single pulse (between .094 and 2.35 seconds) of current between 0.24 to 6 mA, counter-respectively.

You might get a minor jolt (with wet hands, are ye daft?) or just be able to barely perceive it, but either way the discharge is no more likely to cause cardiac arrest than when Ripley the cat jumped out in "Alien".

> "The current world record for a healthy person is a seaman electrocuted standing in saltwater by a 32 volt DC submarine battery. And of course, it generally takes a lot more voltage than that".
>
> Steve Harris M.D.
>
> HTTP://YARCHIVE.NET/MED/ELECTROCUTION.HTML

The 4.5-ish uF capacitor cited, if charged to line voltage, might conceivably be fatal to a *Drosophila Melanogaster* [fruit fly –Ed.] but not to a human if applied externally. Certainly you wouldn't go poking bare conductors with your fingers, licking the terminals of any capacitor or impaling the walls of your chest cavity with the terminals of a charged capacitor, large battery, power lines, etc., lest you succeed in doing something really, stupidly "FATAL", though unless you try, you'll never know (there I go again with that results-oriented thinking!).

> "You can't reliably kill anybody with 20J of electricity. For example: your standard electric chair delivers 2000 Volts A.C. for about 10 sec, followed by 500 V for maybe 120 seconds. You figure a body resistance between two patches of moist broken down (fried) skin of 200 ohms (a realistic figure), and that gives you [(2000^2/200)* 10 sec] + [(500^2/200) * 120 sec] = 350,000 J. And it doesn't always work on the first charge, at that".
>
> Steve Harris M.D., op. cit.

Most telephones (the old fashioned "land line" types, with wires connected to them) use about 90 volts (at 20 Hz over here) to ring, yet I've read of exactly *zero* phone ringer electrocutions (not counting those involving lightning strikes, foul play, or similar strained credulity). It's because they just don't happen.

In regards to the meaning of VAC, Ordous is incorrect though perhaps well intentioned. "Volt-Amps" is used to specify the "apparent power" of reactive electricals in reference to the "power factor" of motors, transformers, UPS units, and capacitors. This is separate and not easily confused with the "rated working voltage" of non-polar (or AC) capacitors, which (in the case of a ceiling fan speed capacitor) is stated in "volts alternating current" or VAC (at least in the US-of friggin'-A). I've never heard of "volt-amps capacitance" or seen any such marking on any capacitor in 20-something years in the electronics industry.

Google "volt-amps capacitance" and you will get *zero* hits for good reason

As for the storage of electricity in a capicator, always with these negative vibes, Moriarty! Duly noted (fer sure!), but this is like saying "Whatever you do, *don't use the salt-water etching process!!! That makes chlorine and it may kill you!!!!*", which, though technically true, is totally irrelevant and a disproportionate level of alarm.

I am glad that someone read my article but wish this Gentle Reader would get real, pull his/her head out and quit finding justifications to go on doing nothing. S/he needs to get off the duff and do something amazing, astounding, or even tangible, instead of wallowing in fear, uncertainty, and doubt.

"Didja see that? That apple could have killed me!!! Good thing it missed!" (Isaac Newton, "My Life as a Hair-Model", 1721).

More fun, fewer suits.

–Prof. Offlogic

on facial hair

In the second issue of Steampunk Magazine is a very interesting article on facial hair, "The Steampunk's Guide to Body Hair." While I did enjoy reading this article, there were a couple of points that I would like to comment on.

The assorted facial hair styles illustrated by Nick Kole have their roots much further back into history than just the Victorian era. Many of these styles have been documented in the early Renaissance, while others seem to have come into popularity much later. The style that is of particular interest to me, perhaps because I'm currently sporting it, is the Friendly Mutton Chops.

The Friendly Mutton Chops is more correctly known in the competitive beard growing circles as the Franz Josef. Before I get much further; yes, there are clubs where men gather to compare beards and moustaches, exchange information on trimming, maintaining, and using wax, as well as holding contests on who has the most impressive facial fluff. Here in the northwest, there is the Whiskers Club in Bremerton, WA. Internationally, there is the World Beard and Moustache Association, known more commonly by their acronym, WBMA.

The Franz Josef beard takes its name from the style of facial hair worn by Franz Joseph I of Austria (1830-1916) [pictured]. This beard is essentially the combination of both Mutton Chops and an Imperial style moustache. Instead of trimming the mutton chops, as many men do, to stop just before the corner of the mouth, they are allowed to grow and blend with the moustache. Whiskers on the neck, up to and just over the edge of the jaw, are shaved away, leaving a well-defined lower edge to the mutton chops. The chin, between both corners of the mouth, is also clean shaven. The mutton chops are then allowed to grow out, and are trained to curl upwards.

This style of beard gained popularity in the mid 1800's and into the later Victorian era, as many men found it a convenient way to combine both a moustache and beard. In Victorian times, as it is today, a well-trimmed Franz Josef helps give the impression of the wearer having a square jaw, while allowing them to maintain a flamboyant military-style moustache, combined with a very populist look of well-trimmed mutton chops. This style of beard was very popular among European nobles, as well as with the common working-class craftsmen. In the United States, this look was commonly associated with the socially established—but politically progressive—merchant working class.

Today, the Franz Josef beard has been separated into two competition classes by the WMBA: the Imperial Partial Beard, and the Freestyle Sideburns categories. The difference being that the Freestyle Sideburns class requires that the neck be clean shaven up to and just over the jawline (as in the original style of the Franz Josef), whereas the Imperial Partial Beard class allows beard growth from below the jawline.

For the male steampunk, these classifications are offered only as a matter of course; each beard wearer is, of course, free to interpret beard and moustache styles for himself. Many gentlemen combine different aspects of beard and moustache growth, creating personalized looks that set them apart from their peers. This is a fundamental part of the steampunk culture: being who you really are, fanatical face fuzz or not.

Note: The next International WBMA Championships will be held in May 2009, in Anchorage, Alaska. As in past events, the vast majority of competitors sport their favorite costumes, from vintage clothes to, turn-of-the-century military uniforms. As for myself, I'd like to show up at this event in my steampunk finest—vest, pocket watch and goggles. I see no reason why our steampunk culture should not be represented on the International scene.

–Christopher delaMaison

The Handlebar Club
http://www.handlebar.co.uk

The World Beard and Moustache Association
http://wbma.whiskerclub.org

World Beard and Moustache Championships
http://www.anchorage.net/worldbeard

Thank you for the clarification, and I'm pretty certain I speak for most everyone in the Steampunk community when I wish you luck and success at the WBMA championship!

on other things entirely

I wanted to say thank you for your magazines. I found them useful, and nice to read. I was always left wanting more in the DIY department, but I don't need a zine to show me how to make everything I want. I am grateful enough, that you left me with such nice things to read.

What I really wanted to say, was I was struck by how much I liked the articles that were written within. It really struck a chord within me. In issue four, I was reading the back, and I noticed the mention of anarchists, and crimethinc. Suddenly, it was very clear why I had found so much in this little zine that I liked. I have always been a fan of crimethinc's endeavors. I should have noticed it before, but didn't.

I wanted to say, I especially liked the article by Johnny Payphone, in this issue. He managed to verbalize many of my own frustrations at modern technology. Between my husband and I, I am the builder, the tinker, and the fixer. I work on the cars, pull apart broken appliances, etc. I have for many years been frustrated at how difficult it is to repair the things I own. I hate throwing things away. I want to fix them. I just recently bought a solder gun, in the realization that I my mechanical skills won't fix circuits. I refuse to let the industry dictate that I can't fix my belongings. I will just have to learn how, and am purchasing several books on circuit bending to do just that. Corporate PR folks might prefer I chuck my old and broken things, but I will not be swayed by that. Instead, I will be fostering new skills, so that I can have the last laugh. I found Mr. Payphone's article heartening, in light my my recent activities.

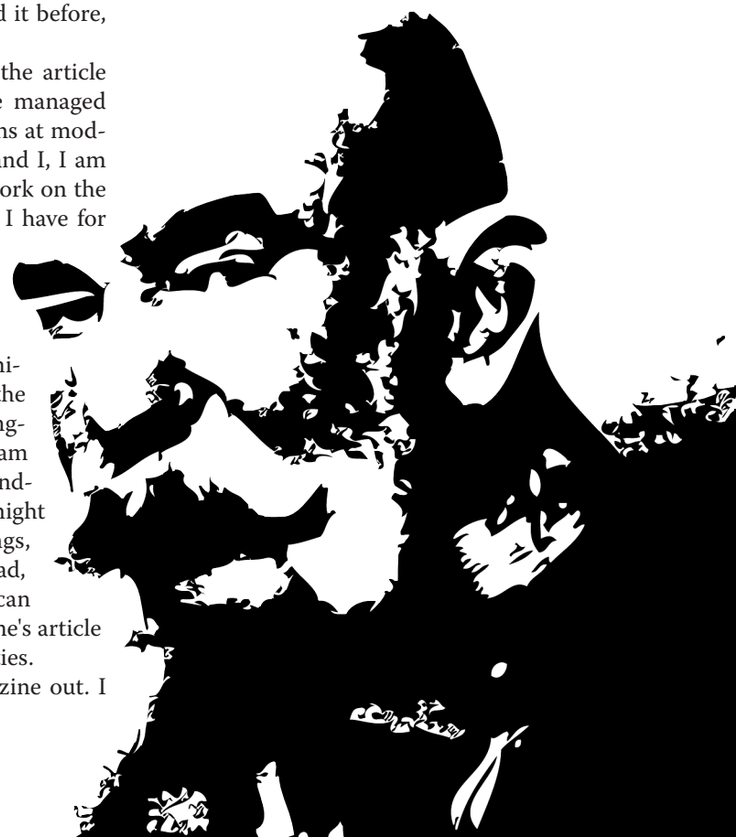
Thank you again, for putting your zine out. I appreciated it. I will miss the frequency with which they are published.

–Sage

I enjoyed reading *Mother of the Dispossessed* [SPM #1]. Though I didn't quite see the connection to the conclusion at the end that "truth is over rated", nor do I agree with it. I believe that a common vein in steampunk is about a search for knowledge, using the unconventional means to acquire the said knowledge. The mad scientist who works by gas-lamp light to gain the knowledge ahead of his time that others would label "devilry" and is cast aside from society. Truth to many is the highest ideal to be obtained and is far from over rated.

I have been enjoying the magazine so far, and look forword to issue 5.

–Mason



Knights of the Road

THE DAWN AND THE RISE OF THE TRAMP PRINTER

by Charles Eberhardt
illustrated by Colin Foran

Late in a sultry afternoon, a tremendous chugging contraption of steel and steam hauls a train of freight cars through fields of Indiana grain. The train slows as it approaches town, and its lone passenger drops from an empty grain car. His only baggage is the derby cap perched upon his head. He struts into town past windowpanes where horseflies buzz. He is not home, but he is no stranger here.

He stops at a shadowy doorway, over which a sign reads "Job Printing Neatly Done." He enters the tepid semi-gloom within. Towards the rear of the office, embowered in newspapers and scraps of paper, sits the editor at his small desk. His blunted pencil slurs as it races towards the end of the page, terminating its marks with a bold "30". Only after spiking the sheet on a spindle does the editor look up.

"Why, hello, Jim," says the editor.

"Hello, Mr. Tucker," answers the new arrival. "How about it?"

A tramp printer has come to town.

The tramp printer's only certain and indispensable possession was the International Typographic Union (ITU) journeyman's card, or "traveling card," a simple piece of yellow paper that entitled him to obtain work at any union shop. With nothing more than the ITU seal and the assurance "that the bearer was a union member in good standing," this little slip paper represented a hard-fought and victorious campaign of solidarity and resistance against the wicked forces of greed.

From the early years of moveable type up until the dawn of the computer age, tramp printers promulgated the craft of printing and knowledge of the written word as they wandered from shop to shop in search of work. At a time when most "country" people didn't move very far from home, the tramp printer was a well-traveled individual who carried with him far-flung and worldy experiences.

These hobo scholars, Hicks writes, "could discuss politics, religion, art, music, history, literature of the most modern and ancient cultural subjects with such erudition that frequently the editor would be found sitting at their round-table discussions by the office stove after work hours in the dim light of a flickering coal-oil lamp."

The tramp printer was a salty character, "an individualist, sworn to personal freedom of action ... He was rough and ready, rude and often profane. He drank hard liquor and enjoyed life to the fullest."

Many went on to become newspaper editors; Horace Greeley, the famed publisher and editor of the New York *Tribune*, started out as an apprentice and worked as a journeyman printer for 14 months before making his way to New York City. Samuel L. Clemens, better known as Mark Twain, worked as a printer's devil on his brother's weekly newspaper, the Hannibal *Courier*, and spent several years as an itinerant printer.

"Perhaps he was never an essentially heroic figure," writes Lampman. "His annals lacked the refinements, as we consider them now, of preferable romance and the larger excitements of big-time drama. But in other days he was not without significance to the plot." Indeed, if life were a book, then the itinerant printer might be the ink and the letters which tell the story.

The Birth of the Union and the Fledging of the Printers

From the colonial days in America, printers were an obstinate, militant bunch. It is no coincidence that the first labor strike in the United States was carried out by printers in Philadelphia. As skilled, knowledgeable and literate workers, they faced a great deal of pressure from bosses and capitalists, who sought to undermine them for the sake of profit.

As publishers increased pressure on the back shop, local unions took steps to defend themselves, such as exchanging "rat lists" of those who had committed severe transgressions. In shops where their activities were forbidden, union members organized clandestinely, using secret signs to identify each other without words. Although they faced prosecutions for conspiracy, "the typographical unions continued to move steadily toward the all-union shop—in which all employees were union journeymen or recognized apprentices," according to Rosemont.

A series of conventions organized by militant journeymen printers led to the creation of the National Typographic Union in 1850, which later became the International Typographic Union. Over the following decades, the ITU established legal defense funds, funds to support strikers and traveling journeymen, and benefit systems to support its members, including a retirement home for union printers. These efforts made the militant ITU strong and resilient.

The union, not the bosses, quickly came to control hiring in union composing rooms. Itinerant printers simply wrote their names down on slips of paper and placed them on the "slipboard" to indicate that they were available for work. There was no need for an interview with the boss or to even speak with a foreman; the tramp printer merely presented his ITU card and waited to be hired. And he was free to come and go as he pleased.

In turn, tramp printers played a crucial role in strengthening the ITU. "The practice of tramp printing helped cement the hundreds of locals together into a cohesive whole" instead of isolated, solitary groups. The tramp printer was very knowledgeable about the ITU's system of laws and zealously saw to their observance. Their itinerant way of life was good for the craft as well, as what was learned or innovated in one shop was carried to all other shops. The tramp printers formed an indispensable network of knowledge and communication which had at its heart a love of the craft, and a deeply ingrained self-protective instinct.

And the Capitalist Resistance

Against this strongly rooted bunch, unscrupulous publishers contrived to divide and conquer the well-organized printers with Technology. The introduction of new Devices, such as composition rollers, powered presses, and typesetting machines, was intended as a wedge to split workers apart. But the militant printers did not back down. Any technological innovation that increased production by reducing the role of the human hand was vehemently resisted, until it was undeniable that such innovation would benefit, not disempower, the worker.

In 1807, printers successfully resisted "the substitution of rollers for the hair-stuffed inking balls that printers had used since Caxton's time." And for good reason: their inventor, Hugh Maxwell, was notorious for refusing to pay union wages, and openly advertised that his rollers would allow employers to replace half of their pressmen with "green hands earning less than half of journeymen's wages." Because of militant resistance to Maxwell's devices, the use of rollers was discontinued and nearly forgotten.

But as the century wore on, the industrial revolution dropped into high gear. As the first powered presses were developed in England, new composition rollers were created that could survive the rigors of mechanical printing. Even though these new ink rollers did away with the disgusting chore of treading on urine-soaked pelts to clean them, English journeymen refused to use the "rolling pins" until their manufacturer made contributions to their pension fund. These new rollers were imported into the United States, but this time, their use spread through the craft, allowing printers to do better work at higher rates of productivity, thus empowering them.

Printers had a deep-seated distrust of new machines and innovations, as did small proprietors who lacked the capital necessary to adopt them. The old skills were becoming obsolete, as unskilled and semi-skilled workers were brought into the shop to operate the new equipment. When the new Treadwell presses were installed in Boston print shops, workers fought hard against them. Even Josiah Warren, called by some "the first American anarchist," was targeted by repeated acts of sabotage in 1840 after he constructed a self-inking cylinder press.

Following the introduction of powered presses, the next quantum shift in printing technology was hot-metal typesetting equipment, such as the Linotype, invented by Otto Mergenthaler in 1883. At first, "the idea that a machine could set type was considered ridiculous," writes Hicks.

Prior to the Linotype, printers all the way back to Gutenburg had laboriously plucked pieces of type by hand, one by one, from type cases and arranged them in lines of type with a composition stick. When finished, each piece of type was carefully returned to its case. The new typesetting machines, equipped with keyboards, could set whole lines of type, thus doing the work of six or seven men. Understandably, printers initially condemned the Linotype as a "job killer."

Their fears were unfounded, though: the new machine spawned hundreds of industries and mil-

lions of jobs. According to Otto Schultz, "It revolutionized not only letterpress printing but journalism itself by its capacity to move massive amounts of information…. It was one of the most effective machines of all time."

The Linotype soon became the most crucial piece of equipment in the shop, even more important than the printing presses. But although effective, the Linotype was a vastly complex machine composed of thousands of parts. Rather than being undermined by this technology, tramp printers and other union workers gained a great deal of power in the workplace by mastering the Linotype, which the publishers and bosses had no idea how to operate or repair. Very soon after its introduction, the Linotype came under ITU control. As the twentieth century dawned, the emphasis in the "back shop" shifted from the printing press to typography and composition. A printer became more than a mere pressman; "printer" came to mean one who was a master of all the skills required for the print shop, not simply the operator of the press. And golden days lay ahead for the tramp printer.

The Path of the Printer: From Printer's Devil to Journeyman

From the earliest days of printing, an aspiring craftsman would complete a five or six year apprenticeship, emerging fully trained with the title of "journeyman." At this point, he was expected to make room for a new apprentice by leaving to wander the countryside in search of his place in the world. Thus, the tramp printer was born.

Every journeyman started out as a "printer's devil" around fourteen years of age. He began his apprenticeship by laboring in the hellish heat and lead-laden fumes of the casting room, where he dumped damaged type into the "hell box" to be melted down into "pigs" to be re-cast into new pieces of metal type.

The printer's devil built the shop fire early on winter mornings, hauled water from the village pump, swept the office, washed the rollers and forms, folded newspapers and delivered the papers at dawn on Thursday morning. From such grueling and menial tasks, the young apprentice moved on to learn the location of each letter in the type case by "dissing"—distributing handset type back to the case after printing.

As a final step before receiving an ITU card, an aspiring printer would often get a permit from the union's local secretary to work "in the toughest shop in town" to prove his competency before applying for membership. If everything worked out, the new journeyman was allowed to join the ITU, draw a travelers' card, and finally set out to satiate the burning urge of wanderlust.

Living on the Road

For a union journeyman, it was easy to get work. "An itinerant printer had only to walk a block or two in any city, anywhere in North America to find a good job," write Howells and Dearman. "If you had an apron, a makeup rule and a pica-pole (and knew how to use them), your future was assured."

Tramp printers could travel throughout North America to Alaska, Hawaii, and points beyond, following the ebb and flow of the seasons like migrating birds. "Some tramp printers, frustrated by the Pacific's limiting shoreline, hopped aboard ships and headed for even more distant, western climes," write Howells and Dearman. "The Publishers Auxiliary offered jobs on steamships, in the Fiji Islands, Guam, Puerto Rico, the Philippines and South Africa."

The ITU card was interchangeable with European printing unions as well. Some printers used their cards to work in England, and several English-language newspapers in Europe hired traveling printers.

Mobility was always key to the success of the tramp printer. In good economic times, it was easy to get plentiful work by moving around. In bad economic times, it was possible to get scarce work by migrating to where the jobs were. During a bitterly prolonged strike, a union printer could draw a traveler and get work on the road. Printer Don Cleary recalled, "At one time I was on strike in West Palm Beach, locked out in Detroit, and working in Washington, D.C.!"

When on the road, a tramp printer might "carry the banner" at the "jungle camp," where transients rested and shared food while awaiting the next freight train. Linafont Brevier recalls one such camp: "It was on the beautiful Kootenai River, and there were several natural springs with pure cold water constantly bubbling up. Pots and pans were hanging from wires strung between two trees. They were spotless, evidently having been scoured with the clean, white sand near the river."

John Edward Hicks recalled various establishments that formed a loose support network for itinerant printers, such as "Jack" O'Brien's pool hall in Chicago, where the generous proprietor would allow transients to make a bed of one of the billiard tables, although if any cash customers came in to play pool they were obliged to sleep underneath the "bed". When nothing else was available, a pile of newspapers on the shop floor often made a suitable mattress for tramp printers who showed up too late or too early for work.

The Price of Freedom

Adventure and freedom always bear certain risks. The tramp printer's preferred mode of transportation, the freight train, was convenient but dangerous. "Learning to catch a fast-moving freight required experience," wrote Brevier. "We would each choose a freight car, and keep our eyes on the lowest rung of the iron ladder going up the side of the car. We would run fast, and as the rung came past, grab it tightly and leave our feet simultaneously.… A leap for the grab iron that missed could very likely mean death under the wheels. … If we had to be secretive on any freight train, we would ride the bumpers between cars. All tramps learned, sooner or later, never to straddle the bumpers. If the train separated at that particular coupler, a hobo's chance of remaining alive was nil."

Tramp printers were sometimes obliged to "ride the rods" by climbing underneath a boxcar. This is what John Edward Hicks and tramp printer "Dad" McGinley were doing one frigid, fateful night while riding to New York City. "It was cold under those boxcars and our fingers and hands were almost numb," Hicks wrote. "'Dad' suddenly relaxed his grip and fell, grabbed wildly for some sort of support, and the next instant was underneath the wheels of the train, being ground to pieces. … I became deathly sick and was vomiting all over myself, but was compelled to hold on for dear life to avoid suffering the same fate…."

And the trains were fraught with other dangers. Railyard "bulls" were a pernicious menace. "Gulf Coast" Guy Foley, a famous tramp printer who drew nearly a thousand ITU traveling cards during his career, was badly handicapped after being severely beaten by a Tennessee cop. His injuries curtailed his travels and hastened his untimely passing.

Beyond the hazards of road and rail, there was the tendency towards alienation and social decay that sometimes accompanies a transient lifestyle. "The oldtime printer was a product of his environment and time, which were not exactly conductive to producing angelic characters," Howells and Dearman write.

Tramp printers were able to resist personal disintegration through their community with other tramps. The sharing of information was a crucial survival strategy. In the West, it was customary for print shops "to keep a record book wherein itinerant printers might write their names, whence they hailed and whither bound," Hicks wrote. "So far as tramp printers were concerned, it was a better method than that universally used by tramps in general, the writing of similar information on water tanks and other conspicuous places along railway rights of way. The printers, of course, used both

methods, the one supplementing the other. I always wrote my name in the books."

Widely-traveled tramps would often keep a "little black book" to record details about each place they worked, such as dates; names of cash-in men, chairmen and foremen; whether they had been fired or barred for six months; and anything else they might forget during their travels.

Sharing of resources was also crucial. "They helped each other over the hard places, loaned each other money, advised each other," wrote Howells and Dearman, "regarding working conditions, the foreman's stoolies in shops, availability of work, cheap hotels, bars that stayed open after hours, and other information vital to the traveling printer.... They traveled together ... and took care of each other wherever they might go."

Uncertain and Dangerous Equipment

If the lifestyle did not bring injury or death to the journeyman printer, than the equipment was almost as likely to. From the 1800s well into the 1900s, printers worked long, hard hours in extreme heat and cold, laboring with "uncertain and dangerous equipment" in poorly lit, ramshackle buildings. One never knew when some mishap might cause grievous injury.

Mark Twain almost crushed his hand while working on his brother's newspaper. Peter Baxter tells of another near-miss fiasco: "We had a flywheel that came loose one time from our old Babcock single-revolution press, made about 1890. The wheel—it weighed about 200 pounds and was 20-22 inches in diameter—slipped off its shaft and promptly took off, going south. It sailed right through our concrete-block wall and straight into a tavern that was located back-to-back with our newspaper office. Made quite a big hole in the wall, too. That wheel could have maimed a whole generation of bar-flies if it had been aimed just a bit differently." Fortunately, no one was injured, and the newspaper made the best of it. "We decided it would be appropriate to put a door in that space so we wouldn't have to walk all the way around the block when we needed refreshment."

The environment of a print shop was traditionally unhealthy, from the leaden fumes of the hellbox to the use of urine by early printers to clean the wool pelts of their hand presses. Although health conditions in print shops steadily improved after the organization of the International Typographic Union, the average life expectancy for printers was estimated at 28 years during the early part of the nineteenth century.

The average press was 75 years old, thus they outlived most printers. There were Cottrells, Babcocks, Campbell "Grasshoppers", and machines like the Little Giant 12 x 18, which "used gas burners to cut static and to dry the ink. If the paper jammed up, a job printer had to act quickly to put out the fire," according to Robert Shaw. The Miehle Vertical job press also used flames to dry the wet ink; if there was a paper jam, "the oil-based inked paper would drop right on the delivery end of the press and a burst of fire would go right up to the ceiling," Shaw writes.

Printers survived such working conditions by being adept. "Your typical tramp printer was at his zenith in an emergency," wrote Lampman. "He delighted to come to grips with problems that baffled the best minds."

One of the stranger tales ever told of ramshackle equipment was related to John Edward Hicks by a tramp printer named "Dixie." Hicks crossed paths with Dixie, a Confederate army veteran, in Atlanta, whereupon he spoke of a most unusual print shop indeed. The equipment at this place had consisted of nothing more than a big shelf covered with a scattered assortment of old wood type, a rack of primer, a dilapidated composing stone and two composing sticks. There were not even any galleys for storing composed lines of type; the editor instructed Dixie to tie them with string and hang them from nails that encircled the empty room.

"I asked the old man when he went to press," Dixie related. "He told me, "'Whenever you get all the nails filled.'" Eventually the old country editor "picked up the form and said he would put it on the press. There was a contraption on the outside of the back door that I had seen but had never thought of in connection with a printing press. ... He let down the slab of wood, set the type form upright against the back slab, held a piece of news print in front of the form and pulled the front slab up against it.... As the editor got the contraption set, he emitted a shrill whistle and here came bounding the biggest buck sheep I had ever seen. The old man said, 'Okay, Buck,' and the sheep's head struck the press with enough force to shake the whole building. After which he pranced away, while the editor pulled off the printed sheet and reached for the ink brayer."

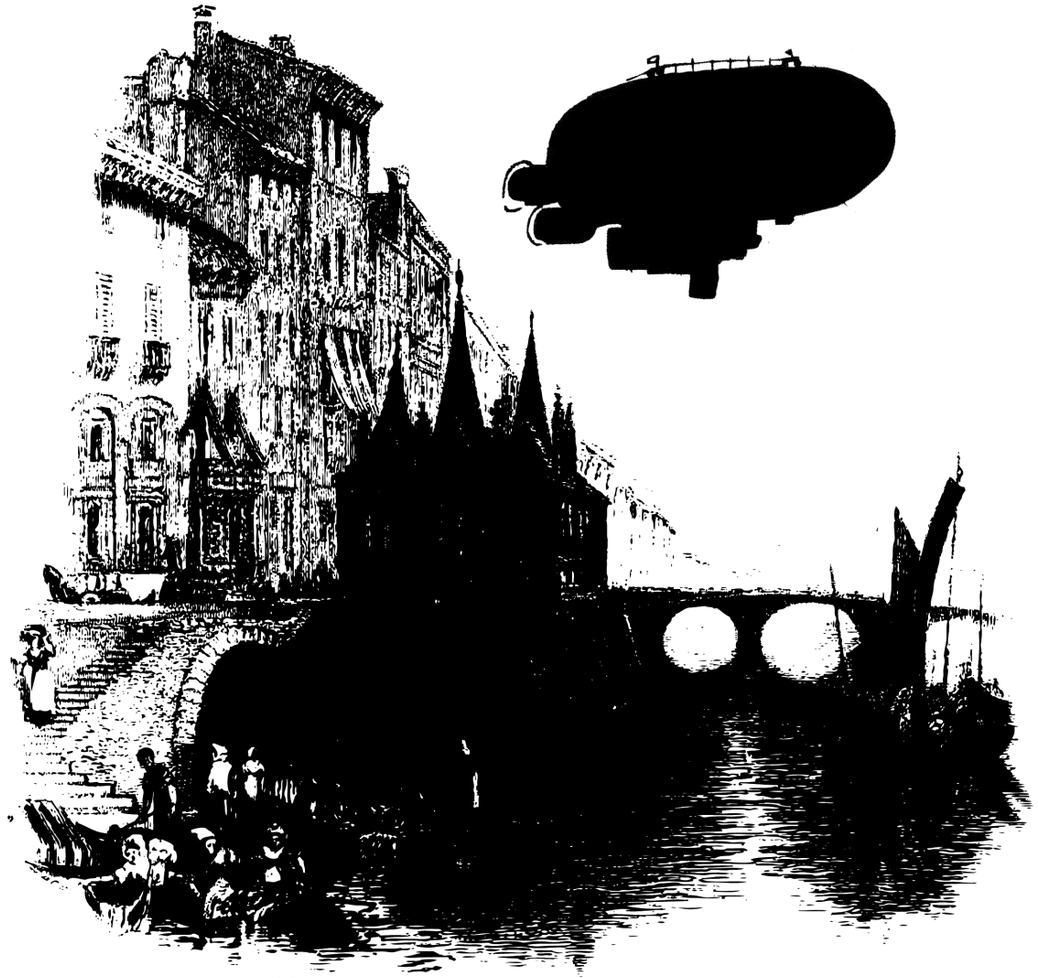
Hazardous Conditions:Printing on America's Western Frontier

The ITU was a tenacious and calloused creature, bred on harsh conditions and adapted to thrive in them. It is no surprise, then, that one of the "golden ages" of the tramp printer was the bloody period of westward expansion that followed the U.S. Civil War. Tramp printers came by foot and by rail to the raw territories of the American West at a time when street shootings, vigilante lynch mobs and riots were not uncommon.

Hicks' recollections document the widespread corruption and graft that existed at the intersection of gambling, alcohol, prostitution, law enforcement, and government. He writes frequently in his memoir of blackmail, bribery and jury tampering, of city political machines entwined with corruption, of syndicates enriched from the indulgences of vice. When the independent press clashed with these nefarious forces, the matter often came to violence. Hicks wrote of one newspaper publisher in Denver who vigorously opposed the gambling syndicates and their allies. "Several attempts had been made to burn his home and shop, causing the printers to work with revolvers buckled on and shotguns leaning against their type cases. Once the rowdies fired into the building and one of them was killed by the answering fusillade of the printers."

Despite the bloody carnage, there were good times also in the Wild West. Hicks spent some time amongst the renowned Missouri River Pirates, a loose-knit group of itinerant printers. "The Pirates were never formally organized, the name merely being given those who tramped the Missouri River valley and lived off the country."

One of the early Missouri River Pirates was "Judge" Grigsby. "I ran across him near the little town of Knob Noster," Hicks recalled. "He was dressed in a frock coat, white waistcoat, striped trousers, immaculate linen and patent-leather shoes—all topped by a silk hat. He was one of the most picturesque of the old tourist printers" who preferred to travel on foot than on rail, in keeping "with his philosophy of a leisurely and gracious manner of spending one's life. As we walked along, he told me something of his theory of life: to live fully and richly, to acquire the greatest delight for the mind in the joys of intellectual curiosity. He would study, he said, the text of nature and the book of life, learning from things about him. He quoted Rousseau to the effect that the only way to travel was on foot while one reveled in the freshness and harmony beside the little streams. Railroads and steamboats, he said, had robbed the pilgrimages of journeymen workers of their poetry, thereby shortening their journey of life."



THE CHRONABELLE

an interview conducted by Libby Bulloff

illustration owes apologies to Dr. Geof

The Chronabelle Crew is a group of people I met last year at MAKE Magazine's Bay Area Maker Faire. They immediately stood out as they drifted about the exhibits in their steampunk finery, but what really drew me to them was the fact that they were quite possibly the youngest but most mature steampunk crew I'd met in my cross-country travels. The Chronabelle is comprised of a number of high-school and college-age students from the West Coast of the United States. They marry cosplay personas to punk philosophies. Their dedication to the genre through fashion, lifestyle, and intellect convinced me to interview them regarding their experiences with steampunk.

I asked the following questions of three individuals: The Grand Duchess, Lady Almira, and Captain Mouse.

Libby: *Tell our readers a bit about the Chronabelle crew. How did you meet? Did you come together with a shared interest in steampunk or did this develop over time?*

Capt. Mouse: I discovered steampunk somewhere…I suspect Boing Boing, but I couldn't say for sure. The next day I came to school and told Lady Almira. It turned out that she has been reading *Girl Genius* for a while now, and it was simply a matter of evangelizing to our friends to develop the Chronabelle crew. So our conversion to steampunk, in name, was abrupt, but like most people, we had a long history of liking steampunk things without knowing they were steampunk.

Lady Almira: We started wearing "steampunk-esque" clothing, and then it just integrated into our everyday lives. The rest of the crew members were friends that expressed curiosity and a desire to learn about the subculture. Eventually, it all culminated in the creation of the Chronabelle.

Libby: *Relay a few details about your experience at the Bay Area Maker Faire, please.*

Lady Almira: Maker Faire has been, and will probably remain the highest point in my experiences as a steampunk. [It] really inspired me and made the entire crew feel as though we were a part of something real. As nice as the internet steampunk community is, getting to interact with flesh and blood folks was a nice change of pace.

Capt. Mouse: Meeting practically all the hyper-talented steampunk makers in one place was… well, some kind of highly positive adjective. Great for name dropping too. Also: fighting robots. I think that is all I need say.

Libby: *What about steampunk do you find most attractive? Why do you think steampunk is so popular with both young and older folks?*

The Grand Duchess: I really appreciate the detail and depth that has developed in steampunk culture. It has taken the literature and used that as inspiration for art, clothing, weaponry, and lifestyles, and has also managed to not become dependent on it. I think this has given steampunk a shared core, but also allows for its development and change. This flexibility is one of the things I like most about the culture, and is why I think it appeals to such a wide range of people.

Lady Almira: I think that it's probably the combination of good standards from across

different eras. I feel as though the heart of steampunk lies in its ability to grasp at what works in a set of moral and societal values and bring them to the forefront. For example, the DIY culture of anti-mass production is truly inspiring. I love holding something in my hands that I know a lot of time and thought went into. I think this is a feeling that connects to both older and younger people, and probably something that really goes a long way into making the age range of steampunks so broad. We're all just a bunch of mad scientists looking for a place to show off our latest toy.

Capt. Mouse: The DIY aspect really clinches it though, even if I'm not terribly good at it, I love creating things and having the sense of ownership that can only be achieved through making.

Steampunk can be taken on many different levels—it can be very exhibitionist or very subtle. From the limited experiences I've had, the older steampunk crowd tends to be more on the building things side of the spectrum—they are much more likely to have space, money, supplies, and skills—and the younger tend to be more fashion oriented. There's something to appeal to all ages.

Libby: *How do you feel about steampunk's growth from simply a genre of science/speculative fiction into a subculture? Do you feel personally responsible for this adaptation, at all?*

Lady Almira: I think it was inevitable. Honestly, if something so aesthetically oriented as steampunk is written about, illustrated, and discussed, wouldn't it also have the tendency to eventually jump off the page?

Libby: *What bothers you about the steampunk subculture or about how the media has treated its popularity over the last year? How would you try to ameliorate these things?*

Lady Almira: I could really get into the nitty-gritty of the matter, but honestly it would just offend loads of people and potentially start a few drunken fist-fights. I will say this: Just because you stick a few gears on it does *not* make it steampunk.

Capt. Mouse: There is so much that I don't agree with in steampunk subculture that I don't even know where to start. But I don't mind; it would be a bit unnerving if this wasn't the case. I take different things from steampunk than many others, but I don't really feel the need to proselytize or convert people to my way of thinking. Hey, if people want to be wrong, that's no problem of mine.

Libby: *What is your favorite piece of steampunk art, music, and/or literature, and why?*

Capt. Mouse: I'm not sure that Neil Stephenson's *The Diamond Age* is technically steampunk, but I adore that book, and really liked the way that Victorianism was reinterpreted. *Girl Genius* is brilliant—it's one of my all time favorite comics. I love seeing steampunk creations that have utility and quality in equal measure—I think that's one of the most valuable things we have to offer—so pretty much everything Jake von Slatt has made.

Lady Almira: Alan Moore's *The League of Extraordinary Gentlemen*. Hands down. However, in terms of contributing to the subculture, I feel as though Abney Park really brings the community together in a lot of ways. Music can bond people like nothing else can.

Libby: *What is your advice to emerging steampunks or steampunk crews?*

Lady Almira: Don't go into it to become important or well-recognized. That's really not enough motivation to keep you going. Do it because you think walking around in a bustle skirt in public is a blast.

Capt. Mouse: Resist the urge to tell everyone about the first few things you do; hold off and make a dignified entrance once you've got something polished to present.

Libby: *How can we keep steampunk punk?*

Lady Almira: Balance is everything. Steampunk is not Victoriana. It is a combination of two styles. Don't be afraid to add a personal touch to everything. Just because the Victorians didn't wear it doesn't mean that you can't. Take liberties.

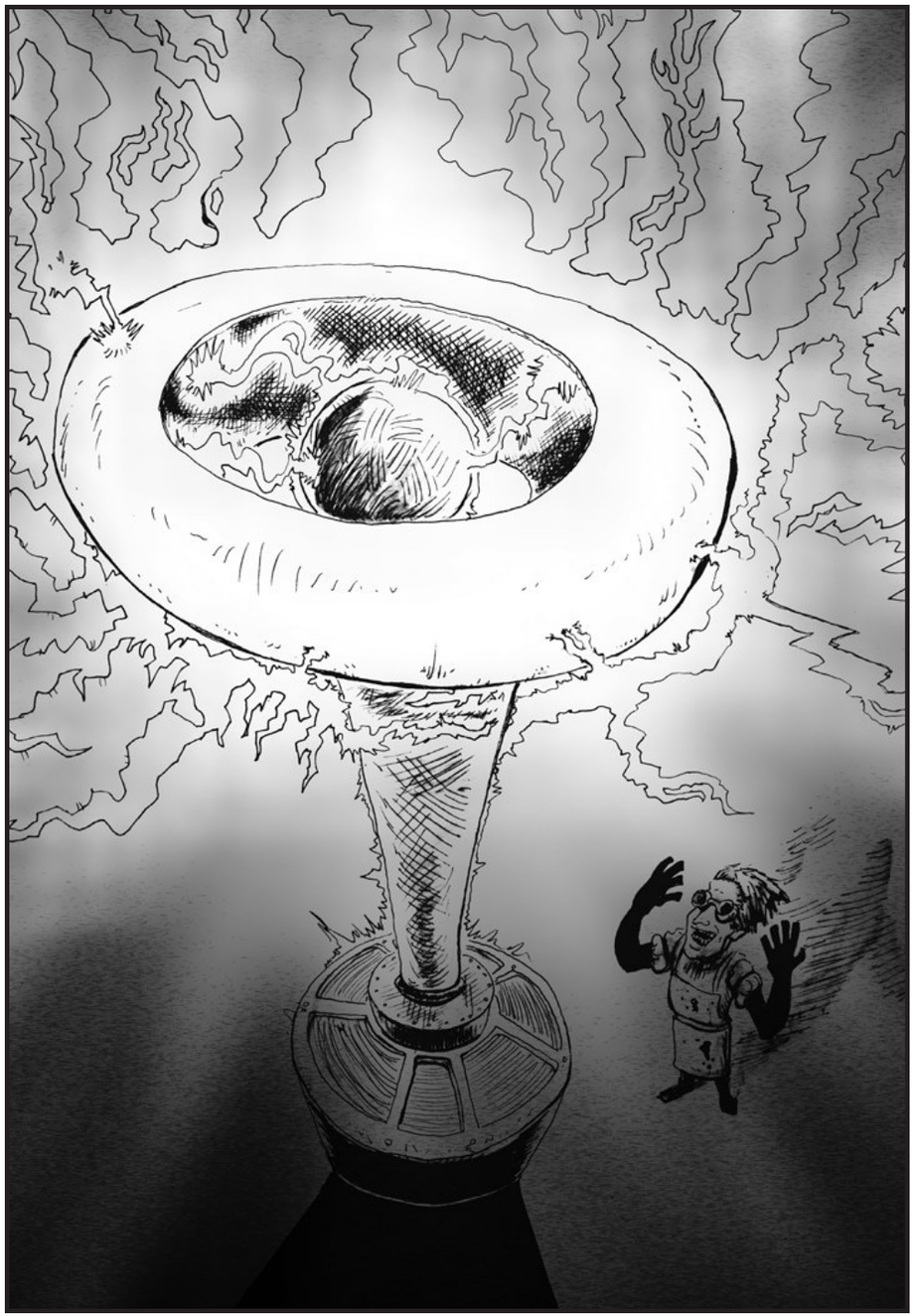
Capt. Mouse: Bimonthly checkups and up to date immunization?

Libby: *How do you think living a steampunk lifestyle contributes to a better existence all around?*

The Grand Duchess: I think a steampunk lifestyle encourages people to think creatively. One thing specifically is that steampunk culture places a high value on the work you can do with your hands, and I think that making art or constructing a catapult and the skills and enjoyment that come from these kinds of practical activities are too often overlooked.

Lady Almira: Do you know the joys of wearing a corset? Yes, men, this includes you.

Capt. Mouse: Steampunk has a valuable reminder to take pride in all the aspects of one's life—a rejection of the disposable culture, built in obsolescence, and dime-a-dozen, cheap plastic junk for the handmade and modded, real wood, metal, fabric, and a sense of quality and individuality.



steampunk AD-LIBS!

illustration by Juan Navarro

We are proud to bring you a modern take on that traditional Victorian parlour game, the ad-lib! In order to play, you gather round a group (any size will do!) of friends and enemies. Then, without reading any of the story aloud, you have the crowd suggests words to fill in the blanks in the story, given only the clues that appear below the blanks. After all of the blanks have been filled, you read the story aloud, and laugh heartily with your compatriots at the strange lack of context to your choices of words!

On the Construction of the Tesla Coil

by Margaret Killjoy &
Usul of the Blackfoot

As the evening sun set outside the laboratory windows, I found myself immersed in the task of creation! No simple machine was scheduled to be constructed that _____ night, but rather, the _____ Telsa Coil.
(over-wrought adjective) (adjective)

Many nights over glasses of _____, my colleagues and I had discussed constructing this, the greatest of electrical devices, but not a one of us had ever set out to actually construct such a _____. But at the last gathering of _____, I was insulted so _____,
(liquid) (noun) (name of made-up organization) (adverb)

so _____ (adverb), so _____ (particularly superlative adverb), by that _____ (19th century insult) of a fellow I dare not consider a gentleman, that I set it into my mind as though into stone that I would complete this task and show them all my _____ (adjective) intellect.

My _____ (object) in hand, _____ (adjective) determination in mind—for a genius such as mine, once set in motion, can no more easily be stopped than the 8 o'clock locomotive bound for _____ (city)—I went to the trunk and withdrew my _____ (noun) as well as a bottle of ground _____ (ingredient). I pulled a _____ (tool) from the pocket on my _____ (article of clothing) and went about to my task.

After clearing my inventory of _____ (plural noun), _____ (plural noun), as well as _____ (plural noun), I finally had everything I needed. I connected the _____ (part of device) to the _____ (source of power) and set off to spend some time at _____ (diversionary activity) to allow the device adequate time to power up.

"_____ (distraught exclamation)", I declared upon my return, "my _____ (contraption) is not so complete as I had begun to hope!" I _____ (past-tense verb) my _____ (body part) for a solution, but to no avail. "_____ (affirmative exclamation), perhaps I need to replace the _____ (part of machine) with _____ (number) _____ (plural of item found in kitchen)."

Of course, I can assume that the _____ (adjective) reader is acutely aware of the mistake inherent in such a haphazard workaround. For instead of alleviating the problem, I had only exacerbated it! I had no choice: I decided I must visit the _____ (victorian profession) and impose upon them to borrow their _____ (tool of above-mentioned trade).

Three hours later, I had what I needed. Having installed the _____ (same tool) into the contraption, I threw the switch!

Oh, dear reader, let me tell you how _____ (adjective) and _____ (adjective) the electricity was as it shot around the room and through my very _____ (body part)! Never had I felt so _____ (mood)! This is truly why we are alive.

That _____ (19th century insult) of a _____ (lowly profession) will never again be able to say such things about my creative prowess! I look forward to when next we meet, for I shall _____ (verb) him soundly until his _____ (body part) is _____ (color).

And thus ends the first of our Steampunk Ad-Libs! If your party still requires additional merriment, we suggest you move on to the second!

D.A.R.B.A., the Automated Machine-Man

by Usul of the Blackfoot

When I was a young lad, I had the immense fortune to visit the Great Exhibition of 1851, held in Her Majesty's Crystal Palace. My uncle, a creator of the most _____ (adjective) and _____ (adjective) widgets in all the Empire, was off to the Exhibition to demonstrate his wares. When he extended an invitation to me, I _____ (past-tense verb) with fervor before exclaiming, "_____ (exclamation)!"

My stomach swam with _____ (plural animal) and my heart pounded like a stampede of _____ (plural noun) when I first caught sight of the Crystal Palace. The front facade was a Classical motif depicting fauns chasing after elusive _____ (color) _____ (plural noun). The crowd amassed around the building sported their finest formal dress, accented by opulent _____ (plural noun) and embroi-

dered _____. They were a sight to see in their own right.
(plural noun)

However, nothing outside the building could begin to compare to the wonders that bombarded one's senses upon entering the Palace. As far as I could see, men stood _____ their creations to life, hoping desperately to impress the _____ spectators. When their machines failed they threw great tantrums, cursing like furious _____ and shouting, "_____, you blasted contraption!"
(participle [-ing verb]) (adjective) (people who yell) (exclamation)

The highlight of the Exhibition was called D.A.R.B.A., whose name was an acronym for _____ _____ _____ _____ Automaton. Why it was named this eludes me, but despite its tawdry name it was truly the crowning achievement of scientific endeavour.
(adjective starts w/ D) (adjective starts w/ A) (adjective starts w/ R) (adjective starts w/ B)

D.A.R.B.A. was a humanoid machine-man that stood _____ metres tall and weighed around _____ million pounds. Its primary functions were _____ _____ and _____ _____, though it was proficient at a number of other tasks.
(number) (number) (participle [-ing verb]) (plural noun) (participle [-ing verb]) (plural noun)

Although it was clearly the most accomplished invention of the day, D.A.R.B.A. was also the source of a tremendous disaster. When _____ _____ started up their _____-powered flame-retardant cannon, D.A.R.B.A. was accidentally doused. Consequently, D.A.R.B.A.'s _____ steam-motivator went haywire, causing its æthereal _____ motor to malfunction. The marvel became a monstrosity.
(military or noble title) (haughty 19th century name) (noun) (power tool or machine) (power tool or machine)

Perhaps due to the glint of her _____ diamond necklace and matching earrings, D.A.R.B.A. ran over and snatched Her Majesty right off her officious seat. Those who were not too _____ to speak screamed "_____!" and "_____, you foul beast!" Rather than waste time talking, I knew I must act to save Her Majesty.
(adjective) (exclamation) (exclamation)

As D.A.R.B.A. hurried toward the door, it destroyed everything in its way with its shoulder-mounted _____ launcher and malevolent _____ laser. I rushed to gather supplies necessary to stop it. I fetched up a _____, a _____, and _____ _____, and hastily threw them together. After mere minutes of toil, I had created a potent _____-blasting power-_____. I took aim at D.A.R.B.A. and fired. The shot whizzed through the hall and struck the terror in its clockwork _____ activator, felling it in an instant.
(noun) (noun) (noun) (number) (noun) (noun) (noun) (noun)

D.A.R.B.A.'s creators were devastated by their loss, but as relieved as everyone else to see the Queen in perfect health. For my bravery and cunning I was rewarded _____ _____ and a _____ _____, in addition to memories that shall last my life through.
(number) (plural noun) (color) (noun)

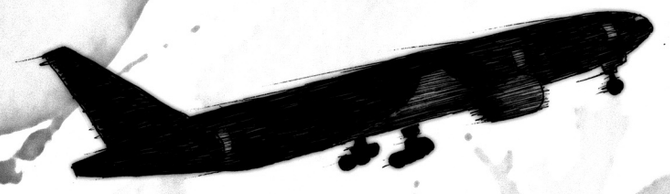
To be certain, your party must now have had its fill of mirth. If you require still more, might we suggest the excellent games "throw rocks at one another" or "drink excessively and vomit!"

On Progress
ON AIRSHIPS

by Carolyn Dougherty
illustration by Fabio Romeu

LORD DR. RICHARD VON TROPP'S EXCELLENT ARTICLE IN STEAMPUNK MAGAZINE ISSUE 3 moved me to share a few thoughts on the vagaries of technological change. We tend to describe it as an almost predetermined progress, a fairly straightforward evolution from less complex to more complex and from less efficient to more efficient. If we look more carefully at how technologies are chosen, however, we discover anomalous narratives that refute this model.

In order to capitalise on his invention of the incandescent light bulb, in the early 1880s Thomas Edison developed a power network in New York City that distributed direct current (DC) electricity. As Edison considered electricity an urban technology, the fact that substations every couple of miles were required to transmit the current was not a drawback. At about that time, after witnessing a demonstration of Edison's inventions, George Westinghouse decided to invest in electrical distribution. As he couldn't infringe on Edison's



patents, he developed an alternating current (AC) distribution system based on two patents held by Nikola Tesla.

Unlike DC, AC could be transported long distances. But it required transformers to be used safely, a point which Edison stressed in a relentless publicity campaign, known as the Battle of the Currents (as you can read about in SteamPunk Magazine issue 2). Although JP Morgan and other financiers backed Edison, Westinghouse's system prevailed after he was awarded two major projects—the production of electricity at Niagara Falls and the supply of electricity to the 1893 Columbian Exhibition in Chicago. AC had become the new standard by the early 20th century, but DC remained in use until 2005, when Con Ed announced that it would cut off DC service to its remaining 1,600 customers (all in Manhattan) by the end of the year. New technologies have since been developed that allow DC power to be transmitted over long distances; such technologies are used to transmit electricity through undersea cables, or when connecting power systems between countries. However, since AC now is the standard for power distribution, this DC power must be converted back to AC.

Technological determinists explain the adoption of AC in technological terms—AC current can be transmitted over long distances and DC current can't. While this is true, it is simply a statement of fact, not an objective measure of superiority; the actual explanation is due to cultural factors. At the time of

the Battle of the Currents, industrialists were in the process of creating monopolies, including regional electrical monopolies, and consolidation was the word of the day. The decentralized and localized system of DC transmission was at odds with the business philosophy of the time. AC also conforms to our society's current values and priorities; if we use AC we can build power stations far from where the power is used. This way we can remain unaware of the extent of their pollution, and we don't seem to object to the defacing of the landscape with transmission lines. If we'd adopted DC, urban form and culture could have been very different. A power station on every block may have caused us to consider less polluting sources of electricity. Small-scale power might have encouraged communities to be more unified and integrated. Power produced locally might have led to electricity being used more appropriately, and to more diversity and a better balance among power sources.

Everyone knows now that gasoline powered cars are far superior to electric or steam-powered vehicles. Electric cars are slow and heavy and have only a limited range of travel. Steam cars are slow to start, complicated and dangerous. But our culture didn't seem to know that 100 years ago; in 1900, American car companies made 1,681 steam, 1,575 electric and 936 gasoline powered cars. And in a poll conducted at the first National Automobile Show in New York City, patrons favoured electric cars as their first choice, followed closely by steam.

The steam car is of course the oldest of the three competing technologies, the first reported example built by Nicholas Cugnot in 1769. The electric car also predates the petrol car; in 1839 Robert Anderson of Aberdeen built the first electric vehicle, and an electric taxi was running in England by 1886. In the United States, Pedro Salom and Henry Morris founded the Electric Vehicle Company in New York City in 1897, expanding to other cities including Boston, Chicago, Philadelphia and Washington, DC. At that time it was the largest vehicle manufacturer—and the largest owner and operator of motor vehicles—in America. The cab model was chosen because the vehicles needed trained drivers, and because it was similar to that of a livery stable in which the owner feeds and maintains the vehicles and power sources. The Electric Vehicle Company saw itself as selling mobility rather than vehicles, and planned to operate the electric cabs as part of a network including electric streetcars and buses. Significantly, this idea of selling a service rather than an object developed at the same time that electrical utilities began to sell power rather than motors.

Electric cabs found a niche in the horse-based transport system. They were quicker and quieter than horsedrawn cabs, and could do more miles in a day than horsedrawn vehicles, particularly in adverse weather. In purely technical terms the electric car was clearly superior to the internal combustion vehicle for both cab and commercial service. Before the introduction of electric starter motors, internal combustion engines were difficult to start—and expensive to keep running while idle—and thus weren't suitable for stop-and-start operation. Electric vehicles were more reliable, and their lower top speeds kept drivers from abusing or damaging them. The drawbacks of limited operating range and of the high cost of batteries were being addressed by the development of a network of battery exchanges by several city utilities.

But despite all the factors in its favour, and despite the support of electrical utilities, the electric car lost ground to the internal combustion car between about 1900 and about 1920. David Kirsch, in "The Electric Vehicle and the Burden of History", suggests many reasons for this, including the poor business practices of utilities and electric vehicle manufacturers, uncertainty over the market the electric vehicle manufacturers were targeting (luxury, touring, or commercial), bad press (the reasons for which are still unclear), and the general economic instability of the time. Other factors included the demand for internal combustion trucks during World War I due to the military's prioritization of speed and range over reliability and quiet operation, and the identification of electric cars with women. Internal combustion vehicles began to dominate long before Henry Ford's assembly lines began producing them in quantity in 1913; by 1914 of the more than 568,000 motor vehicles manufactured in America, more than 99 % were gasoline powered.

Such stories help us understand that choice among competing technologies has less to do with the objective efficiency of the victor than with the ways in which it conforms to the values of the culture within which it is embedded. Which brings us to the airship and the airplane. As we know, the first primitive one-person airplanes were falling out of the sky at the same time airships were transporting hundreds of passengers safely across the Atlantic and around the world. But the reasons for the former's current triumph over the latter seem fairly clear: the airplane appealed to the American's (particularly the American investor's) sense of individualism and adventure (Charles Lindbergh was not only a record-setting pilot but an ardent advocate of the airplane and of airport construction) and the airplane proved to be more useful in war.

But if we can come to recognise how certain technologies mesh with certain cultures and institutions, is it not possible for us to reassess our current choices, and to consciously choose technologies that conform to our cultural values? **What sort of culture, for example, would choose the airship over the airplane?**

A culture, perhaps, that values the physical environment. The infrastructure required for an airship is a fraction of that required for an airplane; one needs only to stand on an empty airport runway (something I've done on occasion in my professional capacity) to appreciate the fact that millions of acres of our planet have been covered with more than a foot of concrete just to provide a smooth and safe surface for these machines. An airship terminal? Grass, maintained by flocks of sheep. Airships can transport people and freight without roads, railways, bridges or airports, avoiding the destruction of habitats or the damaging of wilderness environments.

A culture that values the wise and restrained use of resources. Aside from the savings in the construction and maintenance of infrastructure, an airship uses a fraction of the amount of fuel that an airplane requires just to keep aloft. Airships can even power themselves, producing enough electricity from solar cells to meet their minimal energy requirements.

A culture that values safety. It is instructive to ask strangers how many people they believe died in the Hindenburg explosion (the answer is 35, out of the 97 people on board, and one person on the ground). Despite the popular misconception arising from this incident, airships are far safer than airplanes. They are very unlikely to crash, even in the event of an engine malfunction or any but the most serious compromise of its lift cells. Many airships did crash—the United States Navy managed to destroy four of its six airships, and one of Britain's two first airships, the R-101, crashed on its first voyage. However, analysis of these accidents indicates that the most significant factor was adverse weather, and our satellite and communications technology do a far better job of predicting the weather than even the most experienced airship captain of the 20th century.

Is this our culture? It seems not. Do we want it to be? I think some of us may. Could it be? Perhaps. We don't need to adapt our culture to our technologies. We don't need to accept the technologies we have today, with the unconscious cultural baggage attached. We can think consciously about the values we prioritise, and the values we wish to prioritise, and adopt technologies that are in line with these values.

THE USER'S GUIDE TO STEAMPUNK

illustration by Leah Moore

by Bruce Sterling

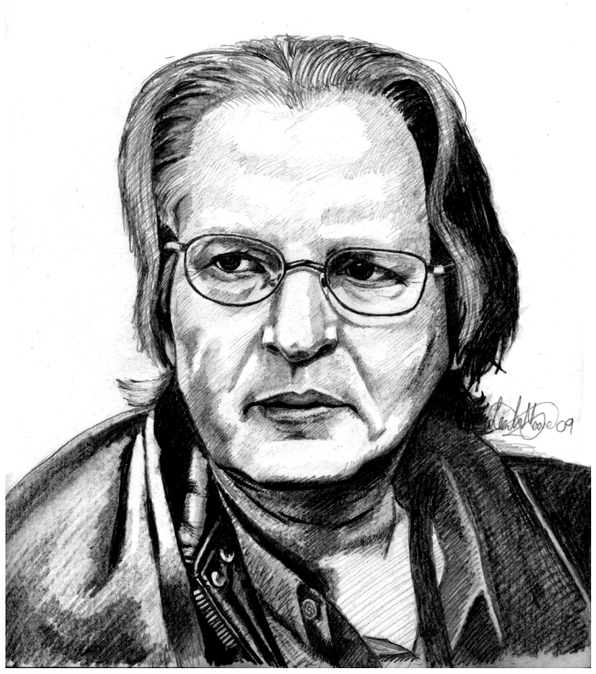
Every year, a group of multimedia artists and various malcontents put together the GOGBOT festival in The Netherlands. 2008 was Steampunk themed. Bruce Sterling, author of the landmark book The Difference Engine*, wrote a thought-provoking essay for the event, which we are quite pleased to reprint here with permission from both the author and GOGBOT organizers.*

Steampunk's key lessons are not about the past. They are about the instability and obsolescence of our own times.

People like steampunk for two good reasons. First, it's a great opportunity to dress up in a cool, weird way that baffles the straights. Second, steampunk set design looks great. The Industrial Revolution has grown old. So machines that Romantics considered satanic now look romantic.

If you like to play dress-up, good for you. You're probably young, and, being young, you have some identity issues. So while pretending to be a fireman, or a doctor, or a lawyer, or whatever your parents want you to be, you should be sure to try on a few identities that are totally impossible. Steampunk will help you, because you cannot, ever, be an authentic denizen of the 19th century. You will meet interesting people your own age who share your vague discontent with today's status quo. Clutch them to your velvet-frilled bosom, because you will learn more from them than you ever will from your teachers.

Stretching your self-definition will help you when, in later life, you are forced to become something your parents could not even imagine. This is a likely fate for you. Your parents were born in the 20th century. Soon their 20th century world will seem even deader, weirder and more remote than the 19th. The 19th-century world was crude, limited and clanky, but the 20th-century world is calamitously



unsustainable. I would advise you to get used to thinking of all your tools, toys and possessions as weird oddities destined for the recycle bin. Imagine starting all over with radically different material surroundings. Get used to that idea.

If you are European, you may further realize that you are surrounded by an ever-growing European "museum economy" that sells your heritage as a "heritage industry." Familiarity with steampunk will certainly help you here. The heritage industry does not sell heritage, because heritage is inherently unsellable. Instead, it sells the tourist-friendly, simplified, Photoshopped, price-tagged, Disneyized version of heritage. Steampunk is great at mocking and parodizing this activity. That's what makes steampunk a thoroughly contemporary act.

If you meet a steampunk craftsman and he or she doesn't want to tell you how he or she creates her stuff, that's a poseur who should be avoided.

This dress-up costume play and these subcultural frolics will amuse and content 90 percent of the people involved in steampunk.

However, you may possibly be one of those troublesome 10 percent guys, not just in the scene but creating a scene. Frankly, the heaviest guys in the steampunk scene are not really all that into "steam. " Instead, they are into punk. Specifically, punk's do-it-yourself aspects and its determination to take the means of production away from big, mind-deadening companies who want to package and sell shrink-wrapped cultural product.

Steampunks are modern crafts people who are very into spreading the means and methods of working in archaic technologies. If you meet a steampunk craftsman and he or she doesn't want to tell you how he or she creates her stuff, that's a poseur who should be avoided. Find the creative ones who want to help you, and who don't leave you feeling hollow, drained and betrayed. They exist. You might be one.

Steampunk began as a literary movement—for some reason no one understands, it started with young Californian fantasists writing about Victorian Great Britain, specifically James P. Blaylock, Tim Powers and K. W. Jeter. This guy Jeter made up the term "steampunk. " He made no money doing that, and you've likely never heard of him before now. I doubt this much bothers Jeter. Jeter was a major disciple of Philip K. Dick, so he always understood the inherent limits of bourgeois mundane reality.

Nowadays steampunk is not about historical pastiche with a sci-fi twist, because, although that's interesting, there's not a whole lot of room for literary maneuver there. Steampunk has become popular now because it is no longer just fiction. It is an international design and technology effort. Steampunk is a counterculture arts and crafts movement in a 21st century guise.

If this idea makes your heart beat faster, I can save you a lot of trouble by recommending one brief essay called "On the Nature of the Gothic" by John Ruskin, the greatest design critic of the original steam era. Go read it. Read this manifesto with great care because it was the seed of the Pre-Raphaelite Brotherhood, Jugendstil, Art Nouveau, William Morris wallpaper, Aubrey Beardsley Yellow Book decadence, romantic-nationalist architecture and about a thousand other things most steampunks would consider very cool.

Ruskin wrote an extremely influential and important essay which changed the world. Everything Ruskin says in that essay is wrong. The ideas in there don't work, have never worked and are never going to work. If you try to do the things Ruskin described in the spirit that Ruskin suggested, you are doomed.

However. If you try to do those things in a steampunk spirit, you might get somewhere useful. Steampunks are equipped with a number of creative tools and approaches that John Ruskin never imagined, such as design software, fabricators, Instructables videos, websites, wikis, cellphones, search engines and etsy. com. Successful steampunks are not anti-industrial as Ruskin was. They are digital natives and therefore post-industrial. This means that they can make their own, brand-new, fresh mistakes—if they understand the old mistakes well enough not to repeat them.

Steampunk's key lessons are not about the past. They are about the instability and obsolescence of our own times. A host of objects and services that we see each day all around us are not sustainable. They will surely vanish, just as "Gone With the Wind" like Scarlett O'Hara's evil slave-based economy. Once they're gone, they'll seem every bit as weird and archaic as top hats, crinolines, magic lanterns, clockwork automatons, absinthe, walking-sticks and paper-scrolled player pianos.

We are a technological society. When we trifle, in our sly, Gothic, grave-robbing fashion, with archaic and eclipsed technologies, we are secretly preparing ourselves for the death of our own tech. Steampunk is popular now because people are unconsciously realizing that the way that we live has already died. We are sleepwalking. We are ruled by rapacious, dogmatic, heavily-armed fossil-moguls who rob us and force us to live like corpses. Steampunk is a pretty way of coping with this truth.

The hero of the funeral is already dead. He has no idea what is happening. A funeral is theater for the living.

Steampunk is funereal theater. It's a pageant. A pageant selectively pumps some life into the parts of the past that can excite us, such as the dandified gear of aristocrats, peculiar brass gadgets, rather stilted personal relationships and elaborate and slightly kinky underwear. Pageants repress the aspects of the past that are dark, gloomy, ugly, foul, shameful and catastrophic. But when you raise the dead, they bring their baggage.

There's not a lot we can do about the past; but we should never despair of it, because, as Czeslaw Milosz wisely said, the past takes its meaning from whatever we do right now. The past has a way of sticking to us, of sticking around, of just plain sticking. Even if we wrap the past around us like a snow-globe, so as to obscure our many discontents with our dangerous present, that willful act will change our future. Because that's already been tried. It was tried repeatedly. Look deep enough, try not to flinch, and it's all in the record. So: never mock those who went before you unless you have the courage to confront your own illusions.

The past is a kind of future that has already happened.

On the "Validity" of Steampunk

by Heather Pund

I've started seeing a great deal of goggle-rattling about how Steampunk is dead and oh noes, it's been co-opted by the masses and is no longer cool.

To which I wish to say, in brief: Get stuffed.

Let me tell you something about being co-opted; I am a belly dancer. My art form, my chosen passion, has been adopted by both Disney and Fredericks of Hollywood. You can find coin belts at Hot Topic, zills in the mall, and harem pants are required as part of the standard Halloween costume. Every single person on the Earth can hum that "nee ne nee ne neee" song and mime headslides. Little Sorority girls tell me gleefully that they've "done bellydance" or have a tape or took a class that one time; so they know all about what I do.

And that's just the civilians. I go to workshops, conventions and performances and there's always a Belly Bunny to be found—all dressed up in something expensive, not knowing good posture from her posterior. There are infinite people who flock to the banner of dance to be sexy, seductive or sensuous, all the while not knowing one damn thing about the God Technique. They flail on stage, look for quarters, or start dropping names as if holding them in their mouths will burn a hole. Tip of the iceberg, folks. We won't even go into the confusion about belly dance and the sex industry.

And you know what? Who cares?

My choice to be a dancer isn't lessened or impacted by some ditz in a fringe belt who doesn't even know there are different styles of dance, let alone different styles of belly dance. (Tribal what?? *hairtoss*) The work I've put into learning the art and performing, the hours of practice, costuming and gaining my chops aren't suddenly moot just because that person over there has decided to try on the "persona" of a belly dancer. I'm not in this for them, or you, or what you think of me.

I'm in this for me. Because it's something I love. Because it's something that matters to me. Because it's something that I feel is worthwhile and something that satisfies me on a deep level.

And as surely as you get the N00bs with the endless questions, sometime shallow interest, and assumptions—you get the Crusty Old Grump who Has Been Here Since The Start and bitterly resents all the new interest. "Why, when I crawled out of my Daddy's Vat in the Mad Scientist Lab" they start, "no one even knew what Steampunk was! You whippersnappers!"

Great, fine; Get stuffed.

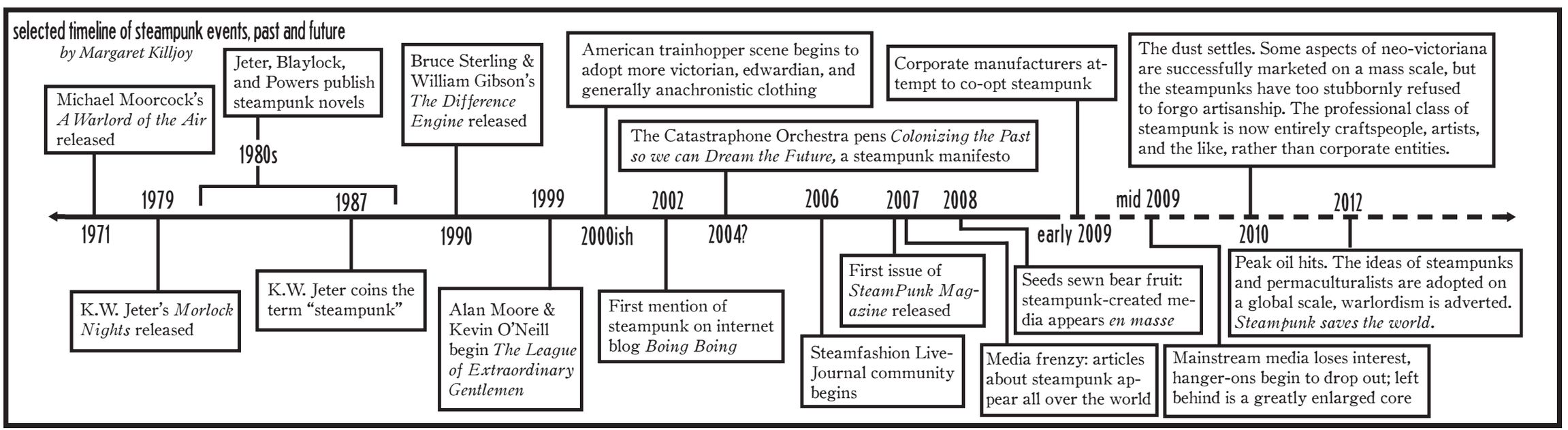
There are a lot of people who dance and there are a lot of people who are interested in Steampunk. Some of these people will stay and some will go but deciding that something is over or invalid just because a lot of people are talking about it is not only short-sighted but a huge slap in the face to those of us who are passionate about it. I don't care if I can walk into Kmart and find bustle skirts with gears hanging off—they still won't fit me because I have a huge butt and a pot tummy. So I'll still go home and make my own. I don't care if I can go into the mall and find things with gears stuck on or tea-dyed or with excessive amounts of brass. That kind of stuff is pretty—but not the totality of what I personally think of as "Steampunk".

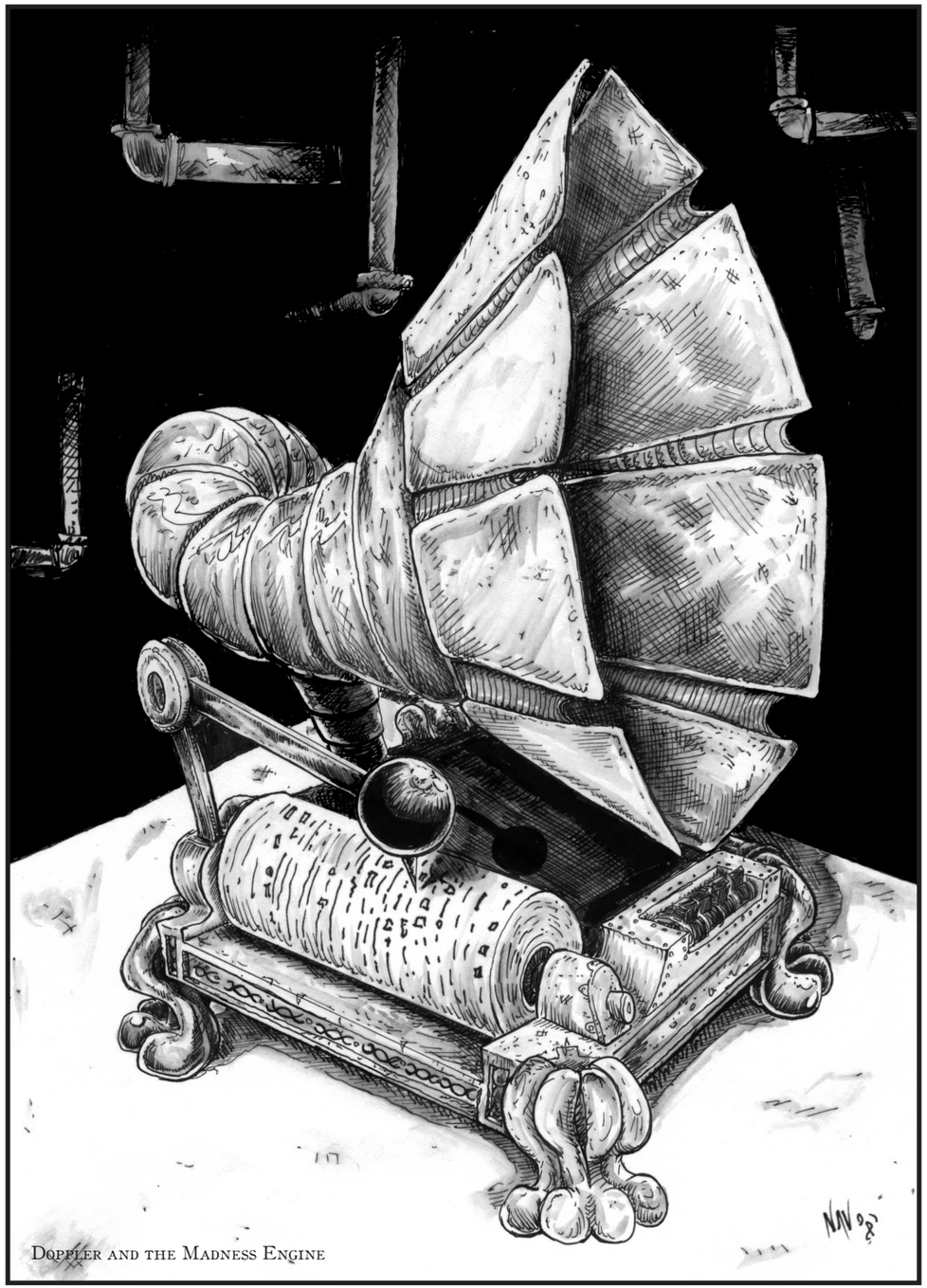
My point being: just because someone borrows the trappings of your art or passion does not cheapen or kill that thing you are passionate about. And if it does—well then. Maybe it wasn't the right thing for you after all?

As for the newcomers—we all started somewhere. Ask questions, challenge assumptions, combine new stuff, but absolutely learn what's already here. In the world of dance, things are a little more laid out and set because it's so physical. You have to learn good posture or you'll hurt yourself. You have to learn the rules before you can start challenging or breaking them.

We learn by asking and we learn by doing and we learn by teaching. If the Belly Bunny bothers you, teach her good posture. If the N00b with gears glued to his face annoys you, start up a conversation and teach him something. Share your passion, share your fire because that only makes it grow. And yes, absolutely, you'll find people who won't understand it but you'll also find people who will. And they are worth the time, effort, and occasional disappointment hands down.

This art, this movement is what we make it. It's as simple as that. And this particular artist has decided that her interests are still quite viable, thank you.





Doppler and the Madness Engine

Part Two of Three

by John Reppion

illustration by Juan Navarro

Extract from Doppler's Journal No. 27.

November the 19th [1865] (evening)

I write this by the light of a streetlamp at the junction of Edward Street where the American spirit medium Mr. Sam Thonlemes formerly conducted his trade. Grober is watching over me as I do so, ensuring that I am not disturbed. We find ourselves surrounded by a chaos of queasy familiarity to me. It is as if my own madness has somehow infected the world at large. I have seen those affected stumble like drunken babes in a terror [words rendered indecipherable by much crossing out] I must start at the beginning. I am having trouble gathering my thoughts. It is difficult to think even at this distance from the house and the hum [words crossed out].

We have moved yet further from Thonlemes' dwelling and once again I write by the glow of a streetlamp. I must record this day's events as thoroughly as possible before I can begin that which needs to be done.

Following the death of the Peterson's maid this afternoon, Grober and I found ourselves in the company of a thoroughly unpleasant Detective Inspector. The fatality was naturally sufficient cause to summon the police and though I felt uneasy at the prospect of being questioned, it seemed only proper that Grober and I should remain at the house to give our version of events as we had seen them. Any other course of action would certainly have been considered suspicious on our part. Mr. Peterson was, of course, distraught at the thought that his lady wife may have caused the woman's fall and begged to be left alone in her company. A family physician by the name of Sloane was summoned—arriving shortly before the police—and it was he who made swift arrangements for the servant's body to be removed. It was all too soon after that Mrs. Peterson was also escorted from the house and into a waiting carriage, the straight waistcoat she wore leaving little doubt as to her destination. All the while Grober and I were kept at a distance from the proceedings, having been instructed to wait in

the parlour as soon as the police ascertained that we were mere visitors who had arrived at the house only moments before the death.

It was at least three quarters of an hour after Mrs. Peterson was taken that Detective Inspector Leeche finally entered the room and introduced himself. Though Grober and I have had many meetings with the law during our time here in England, we had not previously encountered Leeche and he was tediously curious about our affairs. I have no wish to record all the unpleasantness that occurred, all the innuendo and thinly veiled threats that were levelled at us both; suffice it to say that they were of the same asinine nature as always. Was I a child in the guise of a man? Or perhaps a young lady thusly attired "for a lark"? Was I the slave or lover of the "great, ugly beast" Grober? All just as I have encountered and written of countless times. Leeche's persistence was unrelenting however, his baiting of Grober so incessant that I began to worry that my faithful companion would lose his temper and commit some act of violence which would lead to our arrest. Happily, any such occurrence was prevented when a young messenger burst into the room with urgent news. It was obvious that the boy was in some considerable distress and he blurted out his message before Leeche could make protest or direct him out of our earshot. The child spoke of a disturbance at an address which I recognised instantly as belonging to Mr. Sam Thonlemes. Cursing, Leeche pushed the boy out of the room and closed the door behind him. Though I strained my ear I could not properly follow their conversation. A few moments later the messenger entered and told us that we were free to go. Leeche and his men had already left for the address. Grober asked what had happened but the child merely shook his head and said, "I must get home now. I must get home," before rushing from the house. Following a short debate, we elected to follow the officers to the home of Mr. Thonlemes. After all, I reasoned, if some grave misdeed had been perpetrated by the gentleman or his staff it might have some bearing upon our case. A genuine spirit medium—if there could be such a thing—would logically have little or no association with crime. Therefore, I further postulated, this as yet unnamed offence might well expose Thonlemes as a fraud, just as our employer Mr. Shandon had hoped. We found little difficulty in hailing a hansom cab and as dusk descended we began the short trip towards Marylebone and Edward Street.

We were almost at our journey's end when the horse pulling our cab suddenly halted and reared up violently. As a child I recall seeing a horse react in a similar manner at the sight of a nest of adders. The carriage rocked so violently that I feared for one moment it might overturn. Grober and I half jumped and were half flung from the cab as the driver, having already leapt from his place, struggled with the beast's reins. I felt a familiar prickling around my temples and knew instantly that the shock of the situation had triggered one of my attacks. Looking about I realised that there was no obstruction upon the street and no obvious cause for the horse's distress. Even so, the beast continued to buck and thrash wildly, chomping and foaming at its bit. Grober took a few steps forward as if to assist the cabman in his wrangling but then, quite uncharacteristically, hesitated and turned his gaze towards me. He wore a strange expression of bafflement mixed with betrayal. At that very moment the reins where jerked from the driver's hand. The horse galloped away with the empty carriage rattling along behind it, the cabman hollering in disbelief as he tore off in pursuit. Grober's eyes however, remained fixed upon me.

"It is the same. The very same thing again," he said, almost accusingly.

Beyond, I saw our carriage lift onto a single wheel as it struck a curb. Its top collided with a streetlamp and the buggy twisted onto its side, the horse whinnying in terror as it was dragged down by the force of the clash. Turning my gaze back toward Grober I found him with his head bowed and his palms pressed to his eyes as if trying to collect his thoughts.

"Can't you feel it? It is the same as last night when that damned machine was in action."

There was, I realised, a barely perceptible hum all about us. The sound was faint and low but could be felt through the ground itself, just as one experiences vibration through the platform when a steam locomotive approaches its station. This curious sensation confirmed to me that something very real was happening--something that could be, and was being, experienced by people other than myself. Hesitantly, I asked Grober if he felt able to continue. A few wordless moments followed during which my companion took several slow, deep breaths. At length Grober raised his head and, looking somewhat more composed, gave a single nod. I suggested we proceed toward Thonlemes' residence, feeling I must confess, quite unable to think of any other course of action. As we walked it seemed to me as though each successive step upon the throbbing ground required a just little more concentration and effort than the last. Behind us, the cab driver's cries mingled horribly with those of his lamed horse as it thrashed feverishly upon the ground. I admit that I could not bear the thought of venturing anywhere near the stricken animal; my mind buzzed like a hornet's nest and simple self preservation told me that I must shift my thoughts away from the accident at all costs. Their cause was a bleak one and it seemed to me at that moment that hopelessness was a dangerously infectious thing. Though I cannot be sure of Grober's thoughts on the matter, he seemed somehow oblivious to the ghastly sounds at our back.

As we staggered towards Edward Street I became conscious of raised voices ahead. Two police carriages stood at the far end of the road, their horses visibly restless even at such a distance. From our viewpoint, Thonlemes' house stood approximately one third of the way along the street. A small, disorganised crowd were gathered at the building's front and as we drew nearer I realised that the mob was in part made up of some of the officers we had previously encountered at the Peterson's home. Clouds of what appeared to be smoke rose from the ground around the group, making it difficult to ascertain exactly what was occurring. A number of policemen seemed to be engaged in attempts to calm their fellow officers, and there were also members of Thonlemes' staff wandering around as if dazed. Much to my distress I became aware of an object laid flat upon the cobbled road which, viewed through the murk, looked to me very much like a body. The sounds around me grew muffled, the people seemed to fade and I found myself drawn to the shape in the gloom. In what seemed like the merest instant I found myself standing over the corpse of Mr.

Sam Thonlemes. His head rested in a pool of blood which much to my horror appeared to be still increasing in volume. His eyes were open and staring blankly at the night sky, his expression eerily calm and sober. Entranced by the awful sight before me, oblivious to the chaos all around, I stooped to examine the medium's body more closely. His clothing was just as I had seen in his photographs--though his frockcoat was torn at the shoulder and his tie ragged and undone. What caught my attention most however, was the bizarre apparatus that he wore upon his chest. It bore a marked resemblance to the contraption that I had observed yesterday evening in his parlour that had somehow held, and had been able to transmit, the sound of Mr. Thonlemes' voice. The machine was whirring still and, almost without thinking, I reached out and flicked a switch marked DISABLE that brought an end to its progress. It was as I bent to examine the contraption that I first became aware of an unseasonable warmth and of a dampness clinging to my face and hands. That which I had earlier taken to be smoke was in fact a warm vapour which rose from the sewers and grates close to Thonlemes' former residence.

It was then that I was seized roughly under the arms, hoisted to my feet and flung back into the chaotic reality of the situation. I found myself unexpectedly face to face with Detective Inspector Leeche, who seized me by the lapels of my overcoat. He looked outraged beyond all reason and demanded to know what I thought I was doing there. Before I could gather my thoughts enough to even attempt an answer, Leeche was sent sprawling by a slap from Grober's massive hand. Whether my companion ran to my aid or had been standing close by all along, I am at a loss to say. The fact that the blow was dealt with an open hand--and indeed that Leeche remained conscious after its delivery--assured me that Grober's judgement was now not too greatly impaired. The Detective Inspector was, quite understandably, shocked and sat upon the ground gaping at my companion. A policeman shouted something largely unintelligible in Grober's general direction but, instead of coming to Leeche's aid, tore away from us towards the waiting carriages at the opposite end of the street. I realised that the people in the vicinity were now clamorously stumbling along a similar bearing.

"What has happened here?" I asked the still bowled over Detective Inspector.

Leeche blinked incredulously for a few seconds as if struggling to come to terms with the unexpected reversal of our circumstances. Grober extended a hand to the man which, after some little hesitation, he took and was hauled to his feet. Dusting himself off and regaining his composure somewhat, the Detective Inspector suggested that we move away from the house if we were to converse. I enquired why our proximity to the building should make any difference and Leeche let out a short, nervous laugh.

"Because otherwise one of us will end up like him," and here, with a jerk of his thumb, he indicated the body of Thonlemes.

It was clear that Leeche wished us to follow the others towards the carriages but I objected, fearing greatly that we would be arrested when we reached the other officers. Sensing my worry and perhaps thinking something similar himself, Grober placed a heavy arm about the officer's shoulders and we escorted him to the opposite side of the street. Leeche spoke reluctantly and guardedly at first but his inhibitions were soon forgotten as he lost himself in the telling of the tale. I shall do my best here to give the key facts of the matter as he related them:

The police received a complaint last night from a woman, a widow by the name of Derby, who claimed to have been attacked by Mr. Thonlemes during that evening's séance. Though no great bodily harm was done to the woman she was most emphatic that the medium should be arrested. She repeatedly referred to Thonlemes as a demon or devil (as he imparted this detail Leeche glanced furtively at the medium's body across the street from us). Officers arrived on the scene to be told by Thonlemes' assistant Gerard that Thonlemes was unable to speak with them owing to extreme fatigue resulting from harrowing spiritual happenings. Insisting still that they must see Thonlemes, the officers were shown to his bedroom were he was found to be unconscious in his bed. Given the deepness of his sleep and his insensibility when eventually waked, the officers suspected that Thonlemes had been dosed with laudanum or some other soporific. Short of carrying the anaesthetised gentleman to the nearest police station, the offers were left with little choice but to postpone their interview of Mr. Thonlemes until the following day. Gerard assured them that his employer was anxious to clear the matter up himself and that he would make sure that Thonlemes call in at the station as soon as he was able.

When this afternoon arrived and the medium had not yet presented himself, the same two officers who had called previously returned to the house. One of these officers is yet to be located. The second, a Constable Sheridan, was the catalyst for this day's panic. Sheridan was seen stumbling from the house at approximately three o'clock this afternoon by a house-maid who was engaged in cleaning the upper windows of a residence opposite. The Constable was seen to sit dazedly at the curb-side for some minutes. Presently, two gentlemen came strolling along the road and approached Sheridan, presumably concerned by his attitude and condition. Quite without warning the Constable attacked these men with such ferocity that one found his arm broken and the other was throttled into unconsciousness. Had the servant not raised the alarm as quickly as she did, there can be little doubt that both men would have been viciously murdered by the officer. Constable Sheridan was subdued by a mob made up mostly of staff from the adjacent houses. As her colleagues were engaged in restraining the officer the house-maid first noticed the steam rising from a number of drainage gratings close to Thonlemes' building.

By the time additional officers reached the scene, something approaching a riot had broken out on Edward Street, Constable Sheridan having been beaten badly and many of those assembled now fighting amongst themselves. It was noted that horses became restless as soon as they neared the area and refused to enter the street itself. Messengers were sent immediately to gather reinforcements from the surrounding area and this was where Detective Inspector Leeche and him men had become involved.

When Leeche arrived, no one had yet been able to gain entry to Thonlemes' premises; it seems that the front door had been barred sometime after Sheridan's egress. The Detective Inspector

confessed that he became aware of the unpleasant atmosphere surrounding the area as soon as he approached the street but made no mention of it to his colleagues. "I could see by the looks on their faces that they felt the same thing." Those who had been on site for the greatest length of time seemed the most affected and many had grown confused and fearful. Most of the earlier violence had subsided now and it seemed that corralling the remaining residents and officers into the Black Mariahs waiting at the end of the street would not prove overly difficult. Three carriage loads were already taken when the front door of Thonlemes' house burst open. Several members of staff came running from the building, all of whom appeared stupefied and in fear of their lives. These were soon followed by Thonlemes himself who pursued them "as a dog goes after a rat." Leeche was close to the house at this point and saw Thonlemes catch the leg of a young maid and send her sprawling on the ground. He looked on in horror as the medium bit down hard upon the woman's arm. Leeche pulled Thonlemes from the maid and the two men fought. The Detective Inspector's description of their struggles was disjointed and he grew ever more uneasy in its telling until he stopped quite abruptly and stared silently at his own hands. Though unsaid, it is quite obvious that Leeche was responsible for the death of Mr. Sam Thonlemes.

Our current situation is as follows: Leeche has now left us and joined his colleagues. After removing the machine from the body of Sam Thonlemes, Grober and I proceeded away from the police towards the opposite end of Edward Street. It is clear to me that the source of this most peculiar disturbance must lay inside the former residence of Thonlemes. I believe that the affected area is now widening as we continue to witness persons leaving their homes in a state of confusion, some of whom are beginning to act in a violent manner. It seems logical to me that, since we have previously witnessed a similar atmosphere of unease generated by the action of one of Thonlemes' speaking machines, this current situation might well be the result of some broadcast from another, or perhaps many, such contraptions. If this is the case, I need only enter the house and deactivate these devices in order halt this madness. It does indeed seem that the closer one's proximity to the house, the more intense the influence and disorganisation of one's thoughts becomes. For this reason, it is safe to assume that journeying into the building will be disorienting in the extreme. It is my belief however that I am one of the few persons--indeed perhaps the only one--capable of making such a journey owing to my intimate knowledge of insanity and its effects upon my person. My plan is to use the contraption which we removed from Thonlemes' body to create an audible record of my progress which, should the disorientation be so great that I am unable to remember the events clearly and in order, I hope that it may help me to make sense of my journey after the fact. I shall now take a few minutes to familiarise myself with the operation of the machine, after which I will explain my intent to Grober. I have little doubt that he will do his very best to dissuade me from my cause but I am convinced that this is the only proper course of action. If I were a person who believed in such things as providence or destiny I should probably read some higher meaning into my being here, in the midst of these events. As it is, I can only see that if I do not attempt to do something there may be no other who can.

To be concluded.

VOLTAIRE

as interviewed by Margaret Killjoy

Voltaire is a renowned musician, writer, artist, and ne'er-do-well. He's been involved in spooky culture of all sorts for decades, and he's always gone at it with a style that us steampunks will quickly recognize and appreciate. I had a chance to interview him last fall about his steampunkest album to date and about steampunk in general.

Margaret: *Alright, for those readers who are unfamiliar with you and your work, could you introduce yourself?*

Voltaire: I'm a person who makes things. Most of the things I make have a decidedly dark slant and simultaneously a wry or outright humorous bent. In other words, I make things that are dark and funny, spooky but cute. Once upon a time these things were stop-motion animated commercials and station IDs for MTV, The Sci Fi Channel, etc... Then I started making comic books (*Oh My Goth!*, *Chi-Chian*), then I started making music and was signed to a record label (Projekt) and these days I make a lot of toys and still do all of the above. People are always asking me which of these things I enjoy doing the most; music, comics, animation, toys? I generally tell them that I don't do many things. I just do one. I create. Or I throw my hands in the air and tell them I'm an evil clown.

Margaret: *I had a whole slew of questions I was set to ask you, but then I heard your latest album, "To the Bottom of the Sea" and well, I kind of had to drop them all and start again. To the Bottom of the Sea seems like a real de-*

velopment for you, with a clear theme and focused songwriting. What spurred this?

Voltaire: I knew that would happen when you listened to it. That's why I decided not to answer the first batch of questions you sent me! heh heh. To answer your question... I don't know. This CD, I dare say, sounds like a musical to me. And yes, it does have a linear plot line. But I should tell you that it was not planned that way. I simply went about writing a handful of songs for the next CD. When I started putting them in order, I realized that it formed a narrative. I was rather stunned. It's as if I had the story in my head all jumbled like pieces of a puzzle, and then when I had them all in front of me, they formed a picture. At that point, I supported the story by adding a lyric here or there to connect them further, but honestly, the story was already there. I feel like the CD is a sign of the times. Frustrations with the economy, the growing rift between the rich and the poor, our government's dubious activities, all of the these things I think seeped into my mind. It is the best of times, it is the worst of times (depending on whether you're privileged or poor) so I guess it's no surprise I've subconsciously written a musical about a revolution against a tyrannical robber baron.

Margaret: *You've been something of a gothic troubadour for essentially your entire career, focusing on songwriting and performance. What can you tell us about the tradition of entertainers? It seems like nearly a lost art these days...*

Voltaire: To be honest, when I first read this question, I wasn't quite sure how to answer it. I closed my computer and I figured I'd get back to it later. Then I went to Spooky Empire's Horror Weekend in Orlando to play a show. The next day, I was approached by an old punk rocker in the cafe of the hotel. He said to me, "Back in the day, I used to go to see industrial bands. And I had a blast at those shows. Eventually I stopped going to concerts because the shows got lamer and lamer. Eventually it would just be a couple of guys in their blue jeans fiddling with a laptop. What ever happened to being entertained at a show? Well, let me tell you sir, that last night, you entertained the fuck out of me!" Well, I was sort of taken aback and flattered, of course. I honestly, while standing there talking to him, tried to think about what it was that did it. I don't have pyrotechnics, I don't have a fancy light show, or big props or anything like that. I honestly tried to figure out what the connection was between me and the old-school industrial bands that he felt entertained him so much. And I couldn't think of anything tangible that we have in common. And then it sort of hit me. I think it's about engaging the audience. Not just yelling "Hello Detroit!" every once in a while, I mean, somehow letting the audience know you see them and that you are there for them, not for yourself. And my show is nothing if not audience driven. I think storytelling has a lot to do with it too. For centuries all you really needed to entertain a group of people was your mouth and an ability to weave a yarn. That's still true today. No amount of computer graphics and explosions can compare to a story that pulls you in and gets all of your emotions involved. All you really need to accomplish that is a understanding of what it means to be human and a whole lot of honesty. That's what comedy is at its core. It's being honest in the face of what we are all pretending to be. It's admitting you farted a little while talking to the president or that you sort of checked out your mom's tits when she bent over. When my grandmother died, my son and I were going to her funeral. It was his first and I felt I should prepare him. I told him that "Grandma is going to be in a box". It took everything I had not to bust up laughing when I heard those words come out of my mouth. I cried my ass off at my grandmother's funeral but I still burst out laughing when I say, "Grandma's going to be in a box." When I'm on stage, I'm not someone else. I'm me, warts and all. And it's the warts people appreciate the most. Because it reminds them of their own.

Margaret: *A lot of our readers are firmly of the opinion that acoustic music is pretty important in steampunk. To me, it certainly seems natural that anachronistic songwriters like yourself belong in our midst. What's your take on steampunk, and on steampunk music?*

Voltaire: I've been making the kind of music that I make for over ten years now. Over the years people have called it Goth, Acoustic Goth, Dark Cabaret, Folk, Apocalyptic Folk, Gypsy Punk and now with the popularity of Steampunk, they call it that too. Unlike other bands, I don't strive to fit into a category. I think that's a trap. The moment you say that you are a Deathrock or a Ska or a Polka band or any other genre for that matter, chances are you will never grow any further. You might try to make the very *best* polka song ever, but that's where it's going to end. It's not my goal to be easily labeled. It's my goal to make good music that moves me and hopefully others as well. Now, as it happens, I'm a big fan of the past and classical instruments and of Victorian fashion and I'm a big fan of Steampunk so I'm delighted that fans of the genre can relate to what I do because I've been a fan of Steampunk since I first laid eyes on *Chitty Chitty Bang Bang* and Harryhausen's *First Men in the Moon*. That was over 30 years ago. So feel I'm in good company. And I'm glad they welcome me aboard. But I think it makes a lot of sense that Steampunk music, like the aesthetic, should be firmly grounded in the Victorian era. And that to me means that ideally, a "Steampunk band" should only ever use instruments that were in existence during that time... and maybe steam and mechanical devices (and by this I do not mean electronic devices, but rather machines that are either wound up, cranked, spring powered or powered by steam). Aside from those elements, I think everything else is at best a stretch and at worst, posturing.

No amount of computer graphics and explosions can compare to a story that pulls you in and gets all of your emotions involved.

I think that when it comes to the music of the genre, the bands can be separated into three groups: 1) Bands that sing about steampunk issues but use modern instruments. 2) Bands that dress steampunk but make modern sounding music. 3) Bands that make steampunk music.

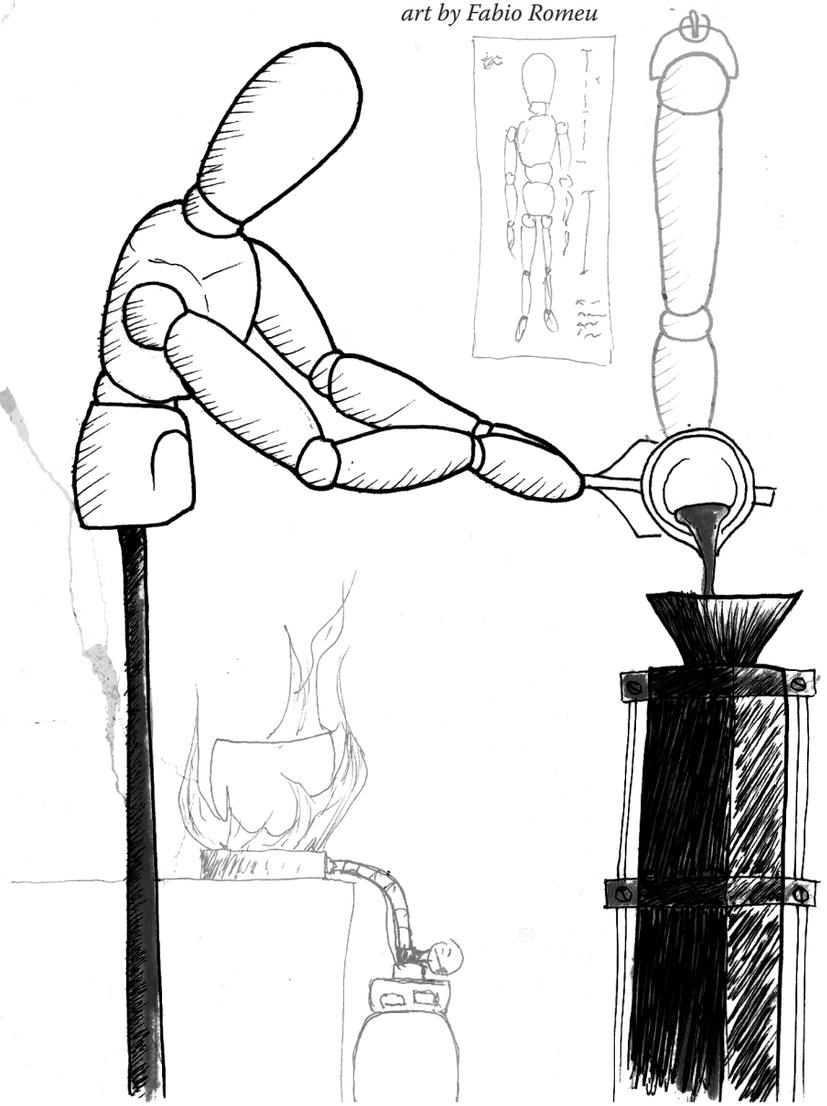
The first category is, I believe, populated by well meaning, ardent fans of the genre. The second category is, sadly, riddled with people using Steampunk as a marketing tool to make whatever it is they do seem somehow mysterious and special. In my opinion, those bands are to Steampunk what Disneyland's Haunted Mansion is to paranormal investigation. Now, I *love* Disney's Haunted Mansion, but nobody's fooled. We all know it's fake. And in the third category, I can only think of very few bands that fit the bill. Amongst them Thomas Truax and Tom Waits. And I'm fairly certain neither of them strived to be a Steampunk act. I'd say Rasputina (of which I'm a big fan), but while they have the turn of the century underwear and cellos, they lack the steam.

I'd put them in a 4th category (along with myself). 4) Bands that have elements that appeal to Steampunk fans.

an introduction to casting

(which, by the way, is dangerous as hell)

written and diagramed by David Dowling
art by Fabio Romeu



The alloying and casting of metal is as old as industry, even defining "industry" in the broadest of terms. Whole fields of academic research have been dedicated to tracing the history and origins of the technology, which pre-dates the written word-libraries penned on the cultural impacts and social conditions generated by metallurgy.

I'm not going into that.

If you want to learn about the marvelous and fascinating history of molten metal, get a library card. The subject is beyond the scope of this article. The objective of this article is, quite simply, to put that earth-changing technology, the foundational pillar of civilization and industry, into as many amateur hands as possible. Hands that can then go on to pattern their own machine parts, jewelry components, sculptures, or ammunition. Hands that can fumble a flask of molten metal and accidentally set alight entire neighborhoods. Your hands.

The metal casting is far too vast and complicated a subject to be encompassed by one article and covers a dizzying scope of scale and material, from tiny gold jewelry pieces to multi-ton iron machine parts. The process we'll be focusing on is one of the simplest, oldest, and most versatile methods of turning a lump of metal into a beautiful or functional what-have-you, commonly known as sand casting. The process is simple enough to be done with readily-available equipment in your basement, garage, backyard or driveway, flexible enough to produce anything from a bronze replica of that 19th century bevel gear you wish you had ten of, to a necklace pendant, to a functional cannon (though the author does not recommend this unless you intend to turn it on your corporate masters, and even then accepts no responsibility). At its simplest, the process consists of taking a pattern (prototype), packing damp sand around it much like you would when forming a sand castle, removing the pattern, and pouring metal into the void. Of course, it's not really that easy. In fact, it's rather difficult. Let's have at.

Before diving into melting your mum's good silver down to make lycanthrope defense devices, a friendly Warning: The following procedure involves extremely hot fires, potentially dangerous fumes, and molten pools of liquid ranging up to 2,000 degrees F and beyond. You will burn at a much, much lower temperature than that, and your lungs are fragile things. Take care.

Supply list:

- Wood or steel to make a molding flask.
- Metal to melt.
- Something to melt metal with (instructions for building a furnace or gas torch not included).
- Something to melt metal in (instructions for making crucibles not included).
- Borax.
- Casting sand (see section on sand for details).
- Talc or chalk and an old, thin sock or nylon stocking for pounce bag.
- Protective clothing—nothing synthetic, close toed shoes or boots, shaded glasses or a full face shield.

WARNING: The following procedure involves extremely hot fires, potentially dangerous fumes, and molten pools of liquid ranging up to 2,000 degrees F and beyond. You will burn at a much, much lower temperature than that, and your lungs are fragile things.

Metals

The metal you choose to work with is obviously going to be dictated by availability and application- jewelry castings are most commonly done in silver and gold, and sometimes bronze or brass. Machine parts are most well suited to brass, bronze, aluminum and iron.

Copper may not suitable for casting without processes beyond the scope of this writing, as it tends to oxidize badly and produce porous, brittle, ugly castings. Feel free to experiment with it, however, as it is readily available in the form of scrap plumbing pipe.

Silver (either fine or sterling) is widely available in the form of serving ware and cheap production jewelry. It casts well and is comparatively inexpensive as scrap and easy to scrounge.

Gold casts very well, but is prohibitively expensive for most of us. If cost is not an issue for you, gold is an excellent metal for casting due to its high resistance to oxidization and smooth flow at molten temperatures. Also, please contact me if you can afford to frivolously experiment with gold as I could use a wealthy steampunk benefactor to fund my attempts to save/ruin civilization.

Brass and bronze are both alloys of copper, tin, and zinc (mostly), and are an excellent choice for machine parts and art casting due to high strength, fairly clean casting properties, and low cost. Brass, love it though we do, contains a large quantity of zinc which produces toxic fumes when melted. I cannot recommend casting brass unless you have an excellent ventilation system and the correct respirator. Bronze comes in many alloys, but unless you have a highly specialized application in mind whatever you can find will be fine. Both are commonly used in decorative hardware and can be found in many yard sales and rummage shops.

Iron can be cast by this method, but due to its high oxidization rate and sluggish flow when liquid, it's troublesome and isn't recommended without further instruction. But go ahead and try if you like! Never let almost certain failure be a deterrent! If you can get it hot enough to melt, you can pour it.

Additionally, you can choose to work in any of the wide variety of soft alloys referred to commonly as "white metals", most commonly pewter, Britannia, or "pot metal". This whole family of metals is utter crap in terms of longevity and strength and not really suitable for anything other than experimentation and decorative objects. And they often contain lead, so don't eat it. On the upside, they're only slightly more scarce and costly than dirt, and cast at very low temperatures.

Models

The first thing you're going to have to do once you have some metal to destroy is figure out what you want to make it into. This is where the model comes in. Models can be made out of anything rigid enough to withstand sand being packed hard around them. I've used carved wood, forged metal parts, found plastic parts, closed cell foam, clay- anything, really can be a pattern. One of the most common and easiest thing to make a pattern out of, if you aren't just making a copy of an existing object, is wax. There are special carving waxes available for this purpose, but anything hard enough to hold its shape will do. A good trick when using wax not intended for carving is to work it with heat to keep it soft, then cool it in the fridge to harden it before casting. Wax can be filed, cut, sculpted, welded with heat and even sanded and polished if it's hard enough.

Whatever you choose to use for your pattern, the one requirement is that it have no undercuts, by which I mean there are no spaces where the form folds in on itself in such a way that it would trap sand packed around it (*See Figure 1*). The pattern needs to be able to come out of the mold without disturbing the sand around it. Undercuts can be done with self-evacuating processes, wherein a combustible pattern is left in the mold and burned out by the addition of hot metal, but we aren't covering that here. See your nearest art student, tinker, or internet for details on lost wax and lost foam casting.

Some authorities maintain that sand castings must be done with flat-backed models, that being a model that only has dimensional stuff on one side and is flush on the other. This isn't true, but it is easier and more likely to produce consistently good castings. In many cases, the easiest way to get a dimensional object out of flat backed models is a two-part model, wherein your initial model is just sawn in half lengthwise to produce two halves that will be packed into the sand molds separately such that the impressions they leave in the sand will match up (*See Figure 2*). Trial and error will tell you what needs to be a two or more part model and what can be cast in one piece.

Molding

The basic sand mold (or cope and drag) is comprised of two rectangular (or square, or round, whatever) frames, like boxes without a top or bottom, which key together and allow some orifice through which molten metal may be poured. These can be fabricated from steel, cast from iron or aluminum, or just nailed together from wood. For very small castings, a couple of tuna cans work well enough, but don't tend to last very long. A better bet is to find a piece of big pipe, three or more inches interior diameter, and saw rings off of it (*See Figure 1*). Molds can take many forms and, while there are some very fine and nigh-indestructible commercially produced cope and drag frames, people have been making them out of whatever was at hand for thousands of years. If you can't figure out how to build a box, you're probably not up to casting your own steam-driven death machine parts. For inspiration and more in-depth instructions on flask making, refer again your nearest library or internet. A link to an excellent instructional website has been provided at the bottom of this article.

Once you have your mold and model, whatever they may be, you'll need to acquire the crucial casting medium- sand. "Sand" is a rather ambiguous term in foundry, as it refers to an endless variety of earth-like substances comprising in different quantities

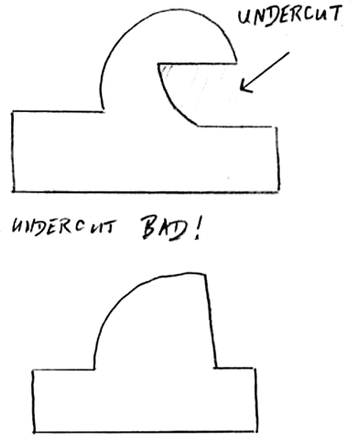
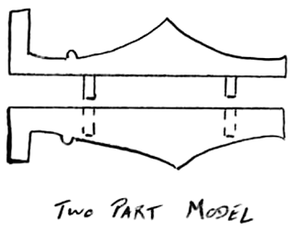


Figure 1: A model with and without an undercut.

Figure 2: The two part model.



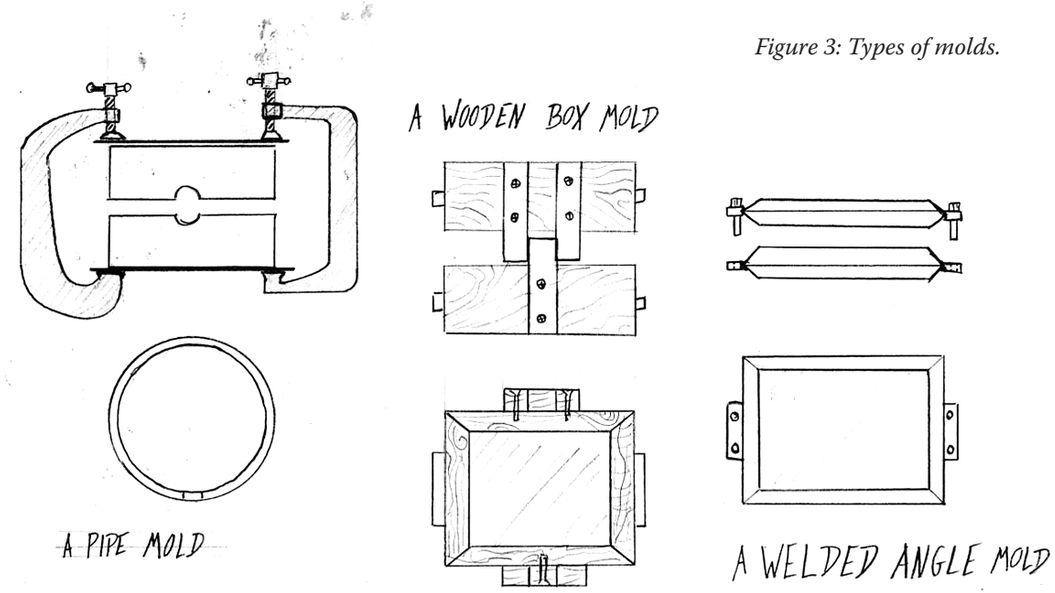


Figure 3: Types of molds.

clay, silica, sundry particulates, resins, and moisture in the form of water or oil. There are sands commercially available to the caster, as well as natural sand available free to anyone with a bucket.

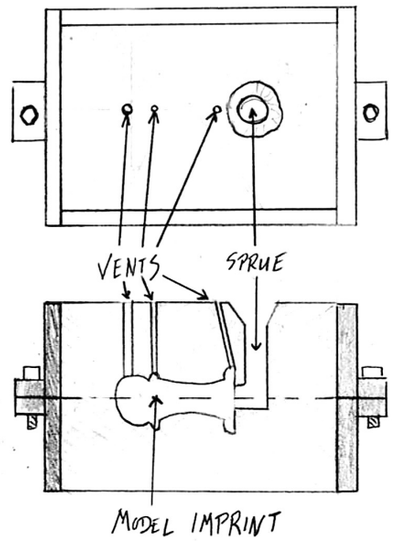
Green sand (which is not really green at all) is a mixture of clay, silica, moisture and various additives that can be purchased commercially or made at home out of clay cat litter, masonry sand and/or silica sand, and motor oil, mineral oil, or water. Really, you can make it out of almost any consistently fine sand and clay mixture: this is one of the places where trial and error come into play. There are no universal rules for making/collecting green sand, but these guidelines should help:

• Don't use beach sand. The salt content seems to keep the molds from sticking together, perhaps because it dissolves when moistened. I don't really get it, but it doesn't work, so don't bother.

• Sift whatever sand you use (be it from a playground or construction site or the nearest post-apocalyptic desert) to produce a uniformly fine grain free of dirt and unwanted rubble. The finer the grain of your green sand, the finer the detail of your castings. Sand with too coarse a grain won't want to hold it's shape or will produce rough castings.

• Add moisture slowly, it's easy to overdo it. You want your sand to have enough moisture that it will bond into a dense ball when you squeeze it in your hand that can be gently tossed and caught without falling apart. When broken in half it should come apart cleanly, not crumble away to nothing.

• If your sand isn't bonding it probably doesn't contain enough clay. Natural sand dug from the earth will usually have enough clay in it to work, refined sand may not. In either case, the addition on kaolin (fireclay) or bentonite clay in small amounts should fix the problem. You want your sand/clay ratio to be about 10 to 1. Good luck figuring out how to ascertain that, I just guess.



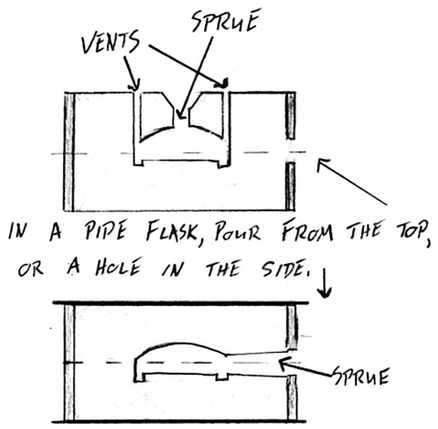


Figure 4: A finished mold with vents and sprue

Making or finding your own sand is a great skill to survive the inevitable industrial collapse with, but if it's too much of a pain or you just can't make it work, your local foundry, art center, or internet should be able to guide you to a resource for buying green sand already made.

Another option, more practical for small scale castings, is a sand-like material called delft clay. It can be found at jewelry, sculpture, and some industrial suppliers and produces very fine castings and comes pre-mixed. I have no idea what's in it but it's easy to use and maintain, and I prefer it for small machine parts.

Both green sand and delft clay are reusable-just remove and discard the badly bunt parts after de-molding you castings, grind anything that heat has dried hard, and add moisture as needed.

Making the mold itself can vary widely in complexity depending on the complexity of your model. For our example, we'll assume you have a fairly small, simple shape with a flat back. Start by laying one half of your flask on a sturdy, flat surface, and packing it with sand. Tamp the sand down with a hammer or stick or something to make sure it's packed tight into all the corners and provides a dense surface. Using a straightedge, scrape any sand that may be above the lip of the flask off, using the flask's edge as a guide. Repack the surface is needed, repeat until you have a suitably smooth surface that comes flush to the edge of the flask. Take a sock or old nylon or bit of cheesecloth filled with talc or crushed chalk and gently bounce it on the surface of the sand. This should deposit a fine layer of powder that will keep the halves of the mold from sticking together. Lay your model on the sand, flat side down and reasonably close to the center of the flask, and again dust with release powder.

A note on sprues and vents: When packing the mold is complete, you will need a sprue through which to pour your metal. A sprue is a channel that runs through the mold from the outside of the flask to the void created by ramming sand around and removing your model. In some cases, the sprue can be scraped out of the sand manually after the mold

has been formed. In others, you'll want to pack a length of pipe or rod into the mold along with your model to act as the sprue. Which to do when is a matter of preference and is dictated by judgment and experience. Generally, in very small castings, scraping the sprue out is fine. In larger castings, ramming a sprue into the mold will help the sprue from breaking apart under the pressure of molten metal and expanding sand. In some cases, you will need to add vents as well. When you pour molten metal into a mold, the air inside said mold will immediately be superheated, causing the release of steam, smoke and all manner of vapors at immense pressure. Since sand is porous, most of these vapors will be able to evacuate through the mold. In many cases, such as where there are fine details that may not fill before the metal cools, or in the case of large castings that generate a lot of heat and gas expansion, you'll need to include vents that allow gas to escape and ensure the flow of molten metal. The placement of vents is another mater of judgment and experience, but generally, more won't hurt. Don't overdo it though, as you'll have to cut all these off later when they're metal (*See Figure 4*).

Once you've figured out what to do with your sprue and vents, lay the other, empty half of the flask on top of the sand-filled flask and model and fill it with sand, tamping it down as you go, careful not to disturb the position of your model. Once the second half of the flask has been rammed down and struck off, you're ready to separate your mold. Tapping the side gently with a hammer will help to release the mold without breaking apart its contents. Remove the model and any sprue and vent fillers you may have used, and you will be left with a mold nearly ready for pouring. All that's left is to make sure you've left a big enough opening on the outside of the mold to pour metal into and to bind the halves together. Scrape and form a cone shape into the outside end of your sprue that will channel any metal you don't pour quite right into the hole instead of dumping it on your feet, and use whatever's handy to firmly hold the two halves of the mold together- if you were clever in the flask making phase, your flask may bolt together or something neat like that. If you weren't, just use wire or a couple of c-clamps.

Melting/Pouring

The fun part, wherein all the dangerous dramatic stuff happens. Your melting needs will vary depending on what and how much you're planning to melt. White metal, pewter, and aluminum can be melted in a coffee can over at hot fire quite readily in small quantities. In small amounts, silver, gold, and some bronzes can be successfully brought to pouring temperatures with a MAPP gas torch of the type commonly found in hardware stores. Larger masses of metal or metals with higher melting temperatures will require more dramatic measures which can range from primitive ground forges to furnaces made from steel buckets and concrete to your welder friend's oxy-acetylene torch. There are no end of DIY how-to articles and YouTube videos for building a furnace if you want to. Otherwise, just find someone with a torch.

You'll also need a crucible, a vessel that can withstand the high heat of molten metal to transfer your 2,000 degree puddle from flame to flask. Steel is a common choice for this, a length of solid pipe with one end capped with welded plate works fine, or any heavy steel vessel. A more common and probably better choice is a fireclay or refractory (referring to any number of heat-reflective ceramic, plaster, and fiber materials) crucible. You can find instructions for making these, but considering that commercially made crucibles aren't expensive, last through a number of pours, and are less likely to explode than home-made varieties, you should probably start with buying one.

Weigh out your metal so you know you have enough to fill the mold but not so much that you'll be left with tons of molten metal cooling in your crucible or on the ground. If you like math and SCIENCE!, you can do this by multiplying the weight of your model by the difference in specific gravity between the model material and the metal you're using. You can also use the fluid displacement method that this guy Archimedes's came up with back in the day- it still works fine. Fill a clear container with enough water to submerge your model. Drop the model in and mark the water level. Remove the model and add metal until the mark is reached again. This, plus however much you'll need to fill all the voids left by your sprues and vents, is how much metal you'll need. Remember that a little too much makes for extra clean-up, but too little ruins your castings. Err on the side of caution.

From here on, it's pretty straightforward- add fire to metal until liquid, flux, pour in hole in your mold. Specifics may vary if you're using a specific type of furnace, follow whatever method is recommended by the instructions you find on furnace building.

Wear eye protection, closed-toe shoes, leather gloves, and natural fiber clothing. Seriously. You will not look tough when you're on fire or pretty when you have hideous scars from synthetic fibers melting to your flesh. If you work cautiously but confidently, you will be fine. As in all dangerous situations, proceed without caution, not fear. Keep plenty of water handy to douse flames or quench molten metal if a mishap occurs. And remember- fire is fun!

Pre-heat whatever vessel you'll be melting metal in with a torch or a brief firing in the furnace to make the melting quicker and easier, begin to add metal when the crucible is hot. Adding your metal in small amounts will help it melt more quickly and reduce the risk of burning part of the metal while the rest is still solid. When your mass of metal begins to get sluggish and runny, add a generous pinch of borax. This substance, sold as a cleaner in most markets, is a naturally occurring salt used in everything from detergents to cosmetic and insecticides and is a handy thing to familiarize yourself with. It also works as a flux in casting, acting to draw impurities out of molten metal and break its surface tension, making it flow more easily. As a handy side effect, it leaves a glassy residue on crucibles that will in many cases help preserve them. Metal is ready to pour when it is

consistently liquid, has a shining and flowing surface (a boiling surface means you may be too hot- this will not ruin your castings outright, but should be avoided), and flows freely when the crucible is jostled. Think of mercury broken from an old style thermometer- mercury is molten metal, it just has a very low melting temperature. It should behave like that.

The critical moment- pouring. Carefully remove your crucible from the furnace or forge or, if using a torch, keep the flame on it while you position it over the mold. Pre-heating the mold itself can help in keeping the metal from cooling prematurely, but is often not needed. I like to heat the mouth of the sprue just before pouring when working with a torch to preventing sudden cooling during the pour. Make sure your mold is on a stable, nonflammable surface, and dump the pool of metal into it with one smooth, even gesture. Try not to miss. Expect smoke, steam, and flames. Flare-ups are normal, but if the mold is still burning after the initial few seconds, it's on fire and should probably be smothered or doused before it spreads.

Congratulations. You've just stolen fire from the gods.

Finishing/Conclusion

Cooling of the metal may take only a few minutes for jewelry and small parts, hours for larger pieces. If the mold is too hot to touch, leave it alone. When you feel it's ready, break apart your mold on a clean surface so you can save the sand for re-use. If it came out right, your casting will be a replica of your model, plus sprues and vents. Cut these away with bolt cutters or a saw, then grind or file off the remainder. The oxides on the surface of your casting can be removed by sanding, grinding, sandblasting- whatever you have access to- or they can be left there.

Common problems you're likely to encounter:

• Parts missing from the casting can be caused by a number of problems. If the bottom cast correctly but it didn't fill all the way and there was no metal left in the funnel at the top of your sprue (called the sprue button), you didn't have enough metal. Use more next time.

• If the top filled but the bottom didn't and you have leftover metal in the sprue button or spilling over the mold, then it cooled too quickly. Make sure your metal is hot enough before pouring, and try to avoid making either your sprues or casting models too thin. When metal flows into thin spots it will want to cool more quickly. Sand casting is better for chunky, solid objects than thin, delicate shapes. Pre-heating your mold will help with this as well.

• If the mold mostly filled but details are missing, the metal either cooled too quickly or encountered air pockets it couldn't fill before cooling. Use more or better placed vents to prevent this and be sure your metal is hot enough.

• If the casting has pits or porous areas in it, there were likely impurities in the metal or it was overheated. This happens a lot, especially in DIY casting setups and with scrap materials. Don't overheat, sort and clean your metal carefully to remove things that might impart impurities or occlusions if you want to remedy this. A pitted casting can be saved by filling the holes with an appropriate material, if you can weld or braze, or with resin, or concrete, or whatever you want.

Be creative. Find unexpected success in your failures. And don't expect this to work out for you every time- it took thousands of years for people to master the working of molten metal. Patience, resourcefulness and tenacity will be rewarded with mountains of metal stuff. Good luck, oh dear reader.

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Congratulations.
You've just stolen fire from the gods.

Funny Thing About Horizons

by Jimmy T. Hand
illustration by Suzanne Walsh

In which the reader is introduced to the use of "they" as a singular pronoun

Far, far from where I pen these words, there was once a small continent in a large sea. Most likely, the sea was on a planet entirely removed from our own, but that's not particularly pertinent to the story.

On this continent there lived people made of clockwork. They were as tall and wide as a human, had two arms, two legs, a head with a mouth and eyes and a nose; they were, more or less, what you expect people to look like. But in the center of each person's back was a keyhole, and each carried a key as unique as an iris to allow themselves to be rewound by their fellows, as they could not reach to wind themself. If a person went without winding for two days, they would wind down and die. If a person was overwound—by intention or mistake—they would die.

Many, many years ago, their society split into two: the Ikli and the Nopal. The Ikli (pronounced, if you're curious, *Ick-lee*) lived on the eastern shore of the continent—which, by the way, neither people had a name for, since it was the only land they knew—and the Nopal (*No-paul*) lived on the western shore. The two groups knew of the other only as legend.

This, then, is the simple tale of Dexa, an Ikli who took it upon themself to cross the wasteland and jungle, to walk rarely-traveled roads, to reach and explore Nopalia. Dexa didn't simply decide to throw themself to fate on the spur of the moment, of course. It was a long

time coming.

Dexa was a non-builder—a person who never studied the trade of person-construction. They had instead studied the oceans and the ponderously large creatures of flesh that dwelt within. Most of their peers instead studied the wild ornithopters, the self-winding badgers, and other metal animals. The salty ocean breezes, after all, wreaked havoc on Dexa's iron skin and they were often in need of repair.

But this professional isolation alone was not enough to drive Dexa across five hundred kilometers of danger. Dexa had fallen in love with Kaxis, another non-builder, and society had turned a disapproving eye to them.

"One of you must take a break from your research to study person-construction," society said most bluntly.

"I've heard of a place," Kaxis told Dexa one night, "where we'll never need to listen to Ikli society again. Nopalia."

I expect it surprises you little that it was love which drove Dexa onto their journey. With little preparation but a great deal of trepidation and exhilaration, the pair set off down the lonely, ruined road, out past the settled lands.

They hiked through jungles, waded streams—careful to apply oil after the crossings. They climbed the high pass of Ereckal and stopped to witness a meteor shower. The sparks descended from the heavens as though a great wheel ground against the sky.

Every two days they stopped and carefully, lovingly, rewound one another.

After nearly a month, three-quarters of the way across the continent, they reached the salt flats.

"Odds aren't great we'll run into an oil spring in there, are they?" one asked the other rhetorically. By this point, after all the two had been through, the pair felt little need to distinguish who exactly had said what.

They sidetracked for days to the south, following the edge of the great desert of salt, but saw no end.

"We've come this far, I suppose."

They re-oiled one another and filled their cans to brimming before setting out across the salt and sand. Two weeks' walk and they were through it, but the days without oil had rusted Kaxis beyond what Dexa could repair.

Sorrow in their eyes, Dexa disassembled their friend and buried the pieces, returning the metal to the earth.

Dexa ran across the final stretch of plains that separated them from Nopalia, heedless to the damage that reckless running wrought on their joints. Their gears stripped, their belts snapped, their bolts unbolted, but still they ran on.

With six hours to spare, Dexa sprinted ragged into a small mining town on the outskirts of Nopalia. Their left arm half-off, they limped to a group of strangers gathered at the market. "Help me," Dexa spoke, "or I'll be dead."

Confused and frightened by the half-apart stranger with the bizarre accent, the villagers turned away and cast no gaze upon them.

Disheartened and frightened, Dexa ran westward out of town. An hour later, they reached another town, with the same result. They continued in blind panic through another two towns before they reached a city, a city of low, skeletal buildings without walls, a city of hustle and of course of bustle, a city that did half its businesses belowground.

"Please," they pleaded, falling on their knees before the first stranger they saw, "please, I will die if I'm not rewound soon. Why will no one wind me?"

The stranger, a street vendor of optics, demurred. "Where's your family? I can't wind you. What if I slip? Your death will be on my hands."

"I'll die at your feet if you don't."

"No, I simply can't risk it. I have business to see to."

With only minutes left to live, Dexa lay at the vendor's feet. But of course, if they had died then and there, this story would not be so extraordinary, for people wound down unattended to in Nopalia every day. Each person's death, of course, was their own tragedy, but this was not to be Dexa's fate.

A person broke free from the nearby crowd and approached. "Oh my," they said, "I've been looking everywhere for you!" This, of course, was a lie. The stranger was pretending to be a friend, for the sake of social graces.

Dexa, grateful, reached into the box on their hip and withdrew their key. The stranger wound them, erring on the side of safety, and helped them to their feet. The two of them left the optics vendor to their business and joined the busy market crowd. Dexa introduced themself and thanked their savior.

The stranger introduced themself as Yatal and led Dexa to the emergency repair room. Hours later, once Dexa was bolted back together, Yatal asked them: "What were you doing on the street, so nearly unwound?"

And so Dexa told them their story, of Iklia and of Kaxis, of their ill-fated journey.

Yatal whistled in amazement.

"Why would no person rewind me?" Dexa asked as they walked the stone streets of Nopalia. "Is it because I am foreign?"

As if explaining the simplest calculus to a young child, Yatal told Dexa that it was unheard of to wind a stranger.

"In Ilkia," Dexa said, "you would not think twice about it."

"But that's horrible! What keeps them from overwinding you?"

"Why would a stranger overwind me?" Dexa asked.

"Well, to steal from you, or perhaps for revenge."

"Is that sort of behavior common here, in Nopalia?"

"No, no, of course not. But surely, you could be overwound by mistake? Left dead in the streets?"

"Occasionally. But I would have been dead in the streets if not for you."

"Well, I'm an honorable person, and well practiced at winding."

"Others are not?"

And in such a manner the two argued until they were quite good friends. Yatal invited Dexa to live with them, in their modest flat overlooking the sea.

"You'll have to pardon the salty air," they apologized, "but the rent is much lower here, and it's quite close to my work."

It came out that Yatal was a geologist who focused primarily on tidal soils, and soon the two had a new bond, that of fellow scientists of the seaside. For several weeks, Dexa accompanied and assisted Yatal in their study, and through the joy of co-discovery and the pleasures of re-oiling and rewinding, the two fell swiftly in love. Dexa missed Kaxis still, of course, but life has an unstoppable forward motion that cannot be ignored.

Dexa though, never came to accept the Nopal culture, and their dislike rubbed off onto Yatal. They considered a return to Iklia, but since Yatal was a non-builder, they knew they would find no acceptance there.

"Where can there be for people like us," one asked the other, "who love each other so deeply and yet desire a basic trust in all people?"

"Nowhere, of course. There is nowhere for us."

"Then we must keep looking."

Yatal spent their entire earnings, and the two built a boat. They stockpiled it with oil and iron and bolts.

"You won't last long out there in the salty air," society said to them. "The ocean is made for creatures of flesh, and we are people of metal."

"I don't care," they both said.

Yatal said their farewells to their family, who shuddered in sadness, resignation, and hope. "If you find someplace better than this," Yatal's builder said, "you come back and you let us know."

"I will," Yatal said.

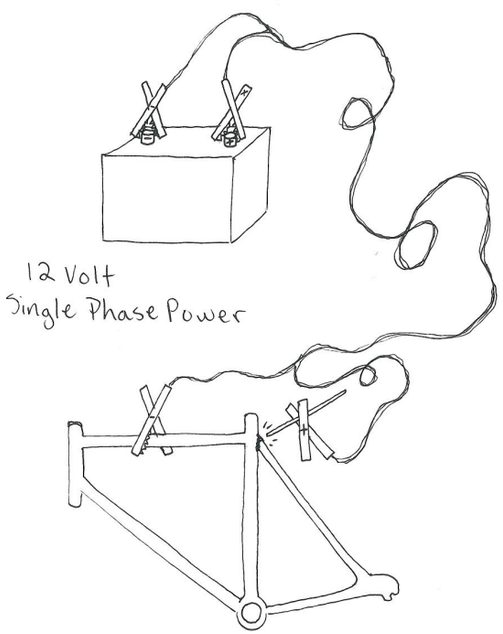
But Yatal never came back. The boat went over the horizon, Dexa and Yatal aboard, and was never seen since.

EMERGENCY WELDING MACHINE

or, how to weld with a car battery, a pair of jumper cables, and a coat hanger

written and illustrated by Zac Zunin

WARNING: Welding is dangerous when done with proper equipment. This article covers how to do it *without* proper equipment, which is just downright crazy. Furthermore, this article is not intended for first-time welders.



This emergency welding system isn't for long term welds, though if you're in a weld or die situation it'll do the trick.

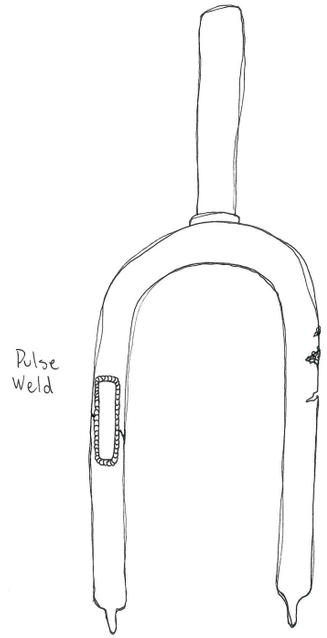
MAKING THE MACHINE

Basically it works like this: you take a 12-volt car battery, a pair of jumper cables, and a coat hanger (or substitute mild steel scrap of appropriate size, 1/8" round or smaller). Attach the cable's negative lead (black handle) to the car battery's negative terminal, then to the piece you want to work on. Next attach the positive lead (red handle) to the coat hanger or substitute. *It's rather important to do it in this order to prevent* ***untimely death****.*

So now you're ready to weld. *With a single car battery you run the risk of blowing up the battery.* While this is an extremely unlikely occurrence, pulse welding is your safest option. Holding the red handle, touch down with the rod, making contact for one to two seconds with short intervals in between. Stack your welds, overlapping one atop the other.

Be aware that your rod is going to heat up fairly quickly; so wrapping the handle in rubber or leather to give you more insulation is not a bad idea. I recommend patching welds thats have to stand up to extended stress or vibration. Bikes and autos for example.

Eye protection is highly recommended, so if you don't have an auto-darkening visor or welding goggles, don't think you can pull off welding with a pair of shades because your eyes won't react properly and the damage to your retinas increases. If you don't have any proper protection available, set your workstation up in such a way that you don't have to hold what you are repairing. Set your rod up an inch above where you want to make contact and look away as you make the welds. Wait a couple seconds until the repair piece stops glowing to check your weld. Keep doing this after every pulse or two for a better weld.



UPGRADING THE MACHINE

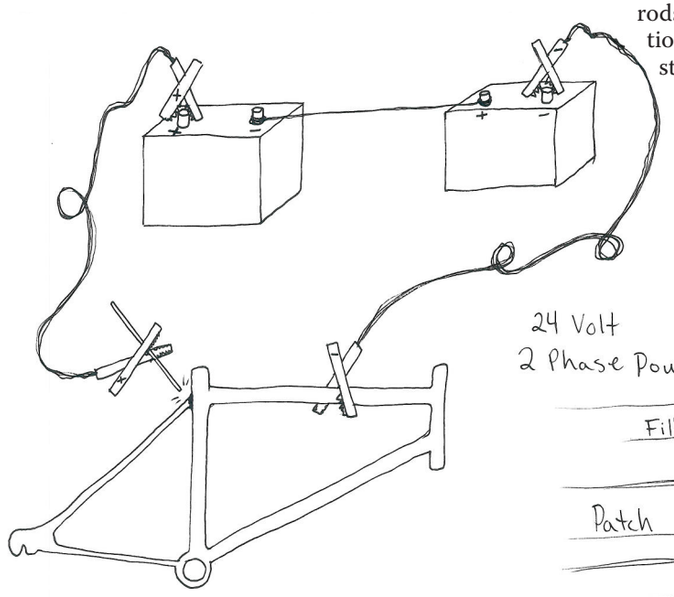
It's fairly simple to upgrade the basic machine to get some extra juice. All you need is a second 12-volt battery, an 18-20" section of insulated copper cable (i.e. telephone cable), or another set of jumper cables. This creates a much safer and more reliable machine. It virtually eliminates the possibility of explosion due to putting to much stress on the battery and uses much more efficient 2-phase power. The output is 24 amps as opposed to 12.

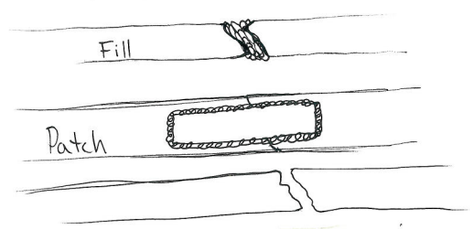
The output of the average commercial Mig welder is between 36-40 amps DC, so you can see you are reasonably approaching the necessary power to do most any weld. 24 amps (two car batteries) allows you to do continuous welds or fill in small sections.

I've built a three-battery system that puts out 36v. This system seems to burn through everything up to about a 1/16 inch thick. Also, it's possible to carry the gear for a more advanced setup; a few arc welding rods found very cheaply at any hardware store go a long way. The machine can be expanded infinitely.

Use level 6 or better replacement lenses ripped out of a Mig helmet. Usually, they're 1 by 2 inches and you can make "goggles" by creating frames out of a cardboard box and fit the lenses right in—instant visor. By using arc welding rods or "sticks" you get far better penetration on your welds, making them much stronger.

I've pushed this machine to its limits many times and never caused an explosion. Regardless, use common sense, and be careful!





ALBUM
Life Toward Twilight
I Swear By All The Flowers
Bottle Imp Productions, 2007
ltt.bottle-imp.com

The simplest way to sell you on this CD is to tell you that it was created entirely of antique sources, sampling music boxes and wax cylinders to great effect. The entire album is restrained, soft, and pretty. As atmosphere, it's nearly perfect.

That said, there is not so much that is *intensely* beautiful about the album, nothing to really draw you in, nothing that will haunt you hours later (with the possible exception of "Sunrise', the final track, performed on a lovely out-of-tune piano). But while this is to say that the work is not a masterpiece, it is certainly well executed and well worth multiple listens.

ALBUM
Abney Park
Lost Horizons
2008
www.abneypark.com

It's possible that there's no musical act more invested in steampunk than Abney Park. Their latest album shows this; it's the first of their releases that speaks intentionally to steampunk. Musically, it's gothic-electronic-rock, and it's their best work to date.

The first song, "Airship Pirate", is probably the quintessential steampunk pop song: tongue firmly in cheek it introduces the Abney Park concept: Abney Park are airship pirates. There's even a song, "Virus", that I'm pretty sure is comparing the spread of religion to the zombie apocalypse.

Other highlights are the European-folk-influenced "This Dark & Twisted Road" and the waltz-beat "Herr Drosselmeyer's Doll". Probably the biggest disappointment on the album is "Post-Apocalypse Punk", which well, isn't punk. Or if it is, it's the kind of punk I've always shied away from and always resented.

The work is definitely a maturation for the band, as though they have finally found their voice.

ALBUM
Crow Tongue
Ghost:Eye:Seeker & The Red Hand Mark
Hand/Eye, both 2008
www.lostgospel.org

Crow Tongue is weird. Like, the sky has gone gray and purple weird, like death-vapors weird, like early Pink Floyd weird. This is a good thing. Most of the time, music described as weird—or associated with hallucinogens—isn't my thing, but both of these albums are clearly listenable.

The first release, *Ghost:Eye:Seeker*, is a drone of occult chanting, noise, and guitar/sitar. Traditional song structure is functionally non-existent. But the album refuses to fall into the trap that so many noise/experimental albums do: this music conveys emotion, and it refuses to sit in the back of your mind. This album would do well played at the climax of your next evening at the opium den in a ghost town's Chinatown, if you ask me.

The second release, *The Red Hand Mark*, seems at first to be more traditional; there are songs, after all. But it breaks into quite interesting territory. Imagine acoustic doom metal. With banjos (well, homemade bass-banjos). And no screaming. Hard to wrap your brain around. Just listen to this CD. Unfortunately, while The Red Hand Mark has moments far more powerful than Ghost:Eye:Seeker, it has more disappointments as well. Thus is the curse of traditional song structure.

Lest you fear that your opium den will go without soundtrack, pick up *Prophecies & Secrets*, which is The Red Hand Mark in dub. Even weirder. Better? Apples and oranges, my friend, gears and flywheels.

The packaging for all of these CDs is beautiful. It's DIY done right. I for one will not mourn the death of the jewel case.

BOOK
Greg Broadmore
Doctor Grordbort's Contrapulatronic Dingus Directory
WETA Publishing & Dark Horse Comics, 2008

As a full disclosure, my copy of this book didn't survive my most recent move and I no longer have it in front of me, much to my displeasure. This thing made for near-perfect steampunk bathroom or coffee table material: something easy and fun to browse. The art it in is absolutely top-notch.

It's a fictional catalog of rayguns. And WETA, the publishers, they know rayguns, better than pretty much anyone outside the department of defense. I'm a sucker for this format, the fictional catalog. I love little descriptions of various fictional trinkets and creatures and people. I've loved them since I first discovered RPG books over fifteen years ago. The book is, of course, steampunk as all get-out, hamming it up without ever quite tipping over into mockery. There are mad scientists and mad colonialists off on their imperialist hunting missions, all well-executed.

Call me a curmudgeon, but I remember some of the humor in this book as a bit off-color in a way I'm not prone to appreciating. And while the book is large, full-color, and beautiful, it's quite pricey for a mere 32 pages of content. Those things aside, makes for a perfect gift to give someone: even if you tell them what they're getting, they won't be able to remember the title!

BOOK
Paul Marlowe
Sporeville
Sybertooth Inc, 2008

Sporeville is a fantasy novel set in a small town in Nova Scotia in 1886. It follows two new residents in the town who begin to notice how strangely the entire population is acting. In traditional young adult novel fashion, the protagonists learn to overcome challenges without the help of their elders.

The main characters are clearly and colorfully portrayed, forming a vivid picture of their world, but this reviewer was able to discern the path the book was going to take after only a few chapters. That said, it was certainly readable and I will happily pick up any future books in the series.

REVIEWS

We are quite happy to review whatever it is that you feel counts as steampunk enough to warrant review. We will, however, only review physical submissions (rather than pdf books or mp3 albums). Contact us at collective@steampunkmagazine.com *to find out where to send things!*

As always, we beseech you:

SUBMIT TO NO MASTER!

(but submit to us!)

The next reading period is:
1st April 2009 until 31st May 2009

We are always looking for content for our magazine. Keep in mind before submitting that we publish under Creative Commons licensing, which means that people will be free to reproduce and alter your work for noncommercial purposes. At the moment, we are paying $30 per article or story that is accepted, regardless of length. This is an experiment: after an issue or two we may (have to/get to) change our rates.

The next reading period is 1st April 2009 until 31st May 2009, when we will be accepting submissions for Issue #6 of SteamPunk Magazine. The theme for Issue #6 is 'The Pre-Industrial Revolution', an opportunity for us all to cast our minds back to the times before Victoria came to the throne and mass-production became a way of life. Possible subjects for articles on this theme could include:

- The development of Victorian thinking
- The history of the Luddites
- A guide to pre-Victorian technology
- How to build and use a waterwheel or windmill
- The history Samuel Taylor Coleridge and the Pantisocracy
- Anarchy, Romanticism, and the French Revolution
- An article on pre-Victorian steampunk costuming
- An introduction to folklore, alchemy and the spiritual revival.

As always, we will be accepting both themed and unthemed material for the magazine, and you should not feel constrained by the examples listed above.

GUIDELINES:

Fiction: We appreciate well-written, grammatically consistent fiction. Certainly, we are suckers for 19th century prose styles, but we do not limit ourselves to this. We are more interested in representing the underclasses, the exploited, rather than the exploiters. We have no interest in misogynistic or racist work. We will work with fiction of nearly any length, although works longer than about 5-6 thousand words will be less likely to be accepted and will probably be split up over multiple issues. We have volunteer fiction editors who, if you would like, can provide feedback on your work; other than this, we will only edit lightly and will always check with you before any changes are made. Submissions can be in .rtf or .doc format attached to email.

Poetry: We are happy to announce that we are now accepting steampunk poems for inclusion in the magazine. These can be written either in a specific form, or as free verse. We can work with poetry that is of almost any length, although work longer than 40 or 50 lines will be less likely to be accepted. As with fiction, submissions can be in .rtf or .doc format, attached to email.

Illustration: We print the magazine in black and white, and attempt to keep illustrations as reproducible as possible. Ideally, you will contact us, including a link to your work, and we will add you our list of interested illustrators. Any submissions need to be of high resolution (300dpi or higher), and we are quite fond of the .TIFF format. This said, contact us before sending any file over 500k.

How-tos: We are always looking for people who have mad scientist skills to share. We are interested in nearly every form of DIY, although engineering, crafts and fashion are particularly dear to us. We can also help to adapt things to print format, if you need it.

Comics: We would love to run more comics. Contact us!

Reviews: We run book, movie, zine, music, etc. reviews. However, due to limited space in the magazine, we will only run reviews of releases that are truly exceptional.

Fashion: Although we are quite interested in steampunk fashion, we are more interested by DIY skill-sharing than exhibition of existing work. If you want to share patterns or tips for clothing, hair or accessories, then please let us know!

Other: Surprise us! We're nicer people than we sound.

collective@steampunkmagazine.com

Issue #5 Editorial Team:
C. Allegra Hawksmoor (Managing Editor)
Margaret Killjoy (Layout Editor)
Libby Bulloff (Contributing Editor)

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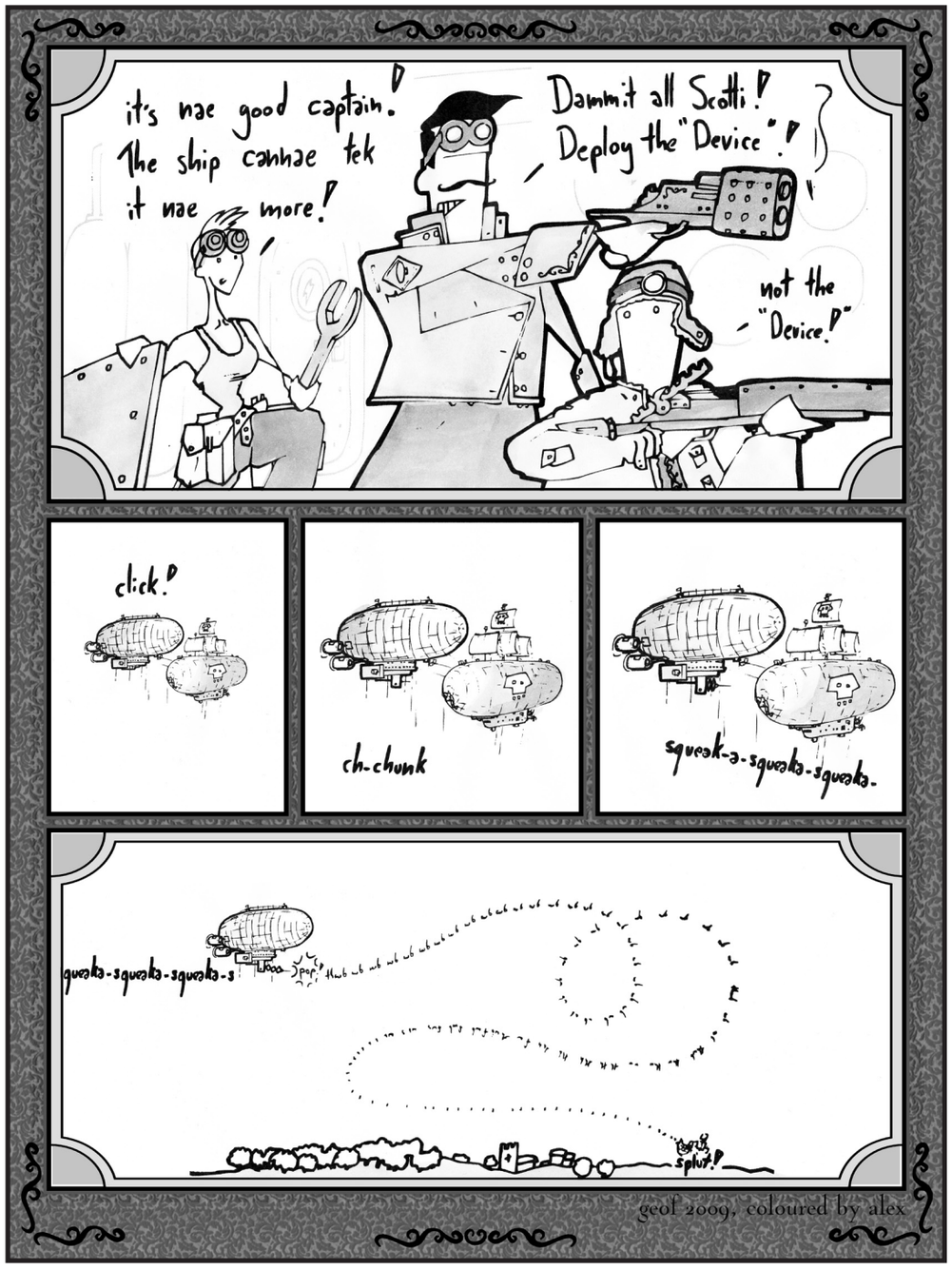
Colin Foran (Page 8)
Fabiola Garza (Cover)
Dr. Geof (Page 68)
Leah Moore (Page 30)
Juan Navarro (Pages 20 & 36)
Fabio Romeu (Pages 26 & 48)
Suzanne Walsh (Page 58)

Colophon:
We used way too many fonts this issue. They include: Oldstyle, HEADLINE ONE, and Headline Two, from the H.P. Lovecraft Historical Society. Nars (Nars), Porcelain (Porcelain), and CARIMBO, by Eduardo Recife. Twentieth Century, by Sol Hess. And our body font is Warnock Pro, designed by Robert Slimbach.



geof 2009, coloured by alex