PYRAMID

Issue 3/46 August '12

WEIRD SCIENCE

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by Sean Punch

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Each article is color-coded to help you find your favorite sections.

Pale Blue: In This Issue
Brown: In Every Issue (letters, humor, editorial, etc.)
Dark Blue: ***GURPS*** Features
Purple: Systemless Features

Cover Art
John Zeleznik

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Greg Hyland

In This Issue

Embrace your weirdness – unless that weirdness takes the form of a backpack particle accelerator. Then you might just want to shake hands. This month's *Pyramid* is devoted to weird science!

Our symposium begins with ***GURPS*** Line Editor Sean Punch as he unleashes *The Power of Weird Science.* Discover how the ideas of ***GURPS Powers*** can drive your devices. It includes a power modifier, talent, and skill-discussion of interest to inventors of the impossible.

Thirsting for more? Then drink deeply of knowledge with Assistant Line Editor Jason "PK" Levine's *Dangerous Concoctions.* These pharmaceutical phenomena are good for any ***GURPS*** game that could benefit from some mad medicine.

David L. Pulver – author of ***GURPS Psi-Tech*** – brings to light some real-world weirdness with this month's *Eidetic Memory.* Discover the *Red Science* behind "red mercury" and associated oddness. It includes a number of weird ***GURPS*** items that use this amazing material, including an assortment of explosives and the Mashina PBM-90 Russian bipedal combat robot.

For those looking to make their own oddness, it's time to retire to the lab and create *Metatronic Generators.* Inspired by ***GURPS Psi-Tech,*** this optional ***GURPS*** design system will let you create all manner of odd items perfect for the weird-scientist in your life. It also describes eight sample items, including the repelling revolver and the ricocheting discus.

Oddball theories have been with us as long as there have been oddball thinkers. Noted ***GURPS*** author Matt Riggsby looks at many innovations he wrote about in ***GURPS Fantasy-Tech 1: The Edge of Reality*** and updates them for more modern eras, with *Fantasy-Tech 2000.* Discover the *impossible* power of the centripetal steam gun, the dieselpunk steam cannon, the space-age reflective heat ray, and much more.

For those looking for an alternate weirdness-design system, ***GURPS Reign of Steel: Will to Live*** author Roger Burton West introduces you to *The Daughter of Necessity.* Unleash the power of the core ***GURPS*** character creation system in new and strange ways! It includes eight super-science samples to get you started.

As we near the end of our issue, we get around to asking, *What Is Weird Science?* We look at some history, insight, implications, and more. And to make sure you're dressed for scientific success, our last page features an *Appendix Z* on *Super Costumes.*

No crazed conference at *Pyramid* would be complete without our usual *Odds and Ends,* a *Murphy's Rules* that looks at lionhearted librarians, and *Random Thought Table.*

With science, the possibilities are endless. With *weird* science – and this month's *Pyramid* – the *impossibilities* are endless!

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From the Editor

Weird Matters

Like obscenity, weird science has a certain quality of "I know it when I see it." Even in other eras, that which is weird tends to have a certain feel. Despite being insanely advanced, an iPad probably wouldn't register as particularly weird to folks 70 years ago; many authors from the Golden Age of science fiction a few years later were able to envision such devices. However, something like an MRI machine – with its loud noises, odd human-encasing enclosure, and plethora of lights and readouts – might well be viewed as "weird science" when viewed objectively with pre-modern eyes.

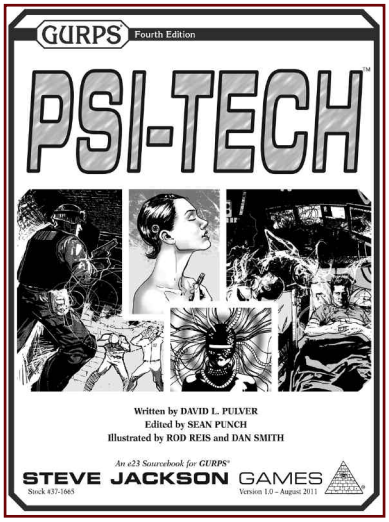
This issue of *Pyramid* assumes that you'll be able to define weird science in your campaign (although we offer some insight into that on pp. 33-35). To that end, it contains a number of ideas to get you pointed in the right direction, plus some systems to help you create your own unusual devices.

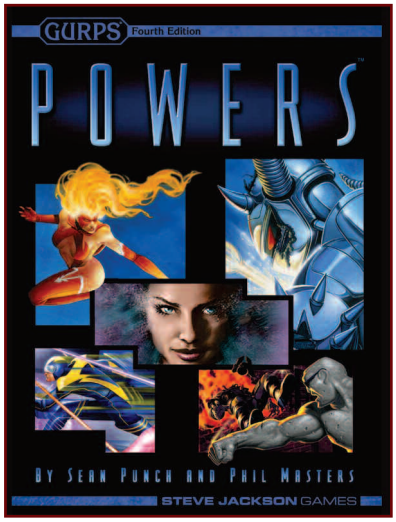
Although similar to past tech-related issues of *Pyramid,* this installment is somewhat unique in being devoted much more than usual to optional new goodie-creation systems. This is largely because weird science often creates unique gizmos. Hopefully, you can find one (or more!) options that will give all the cackling scientists of your setting something interesting and new to do.

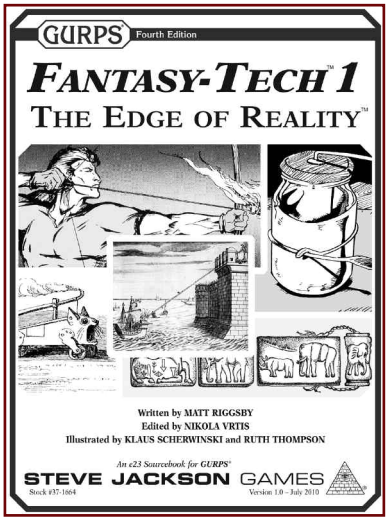
Write Here, Write Now

Was our science sufficiently weird this month? Or was there something in here no sane madman would be caught dead with? Let us know privately how we're doing at showing those fools that *they'll be the ones who will be sorry,* at **pyramid@sjgames.com**. Alternatively, deliver your public ideas about *Pyramid* that the scientific community dared to reject at **forums.sjgames.com**.

Finally, don't forget that we always encourage would-be wordsmiths to try their hand at writing for us. Information about contributing is online at **sjgames.com/pyramid/writing.html.**







Additional Material: Jason "PK" Levine and William H. Stoddard

The Power of Weird Science

by Sean Punch

Many people see weird science as being chiefly about creating remarkable artifacts. As befits weird science, that nice theory sprouts thorns in practice – at least, once you attempt to address it in game terms. Troublesome questions arise about whether items should be built as advantages given gadget limitations (pp. B116-117) and paid for with points, invented through *Gadgeteering* (pp. B475-477) and bought with cash, or placed somewhere in between, described by Unusual Background (Invention) (p. B477). And whatever answer the GM chooses, he'll face posers like "Why can't I share gadgets built on points with my friends?" and "How do points interact with dollars, Complexity, and TL?"

An alternative approach is to decide that weird scientists *aren't* inventors but people with an innate gift for eliciting amazing effects from items that are already extraordinary in some way. They're surrounded by a field of weirdness that enables them to tinker with unusual artifacts and produce results that the ungifted simply cannot duplicate. In game terms, they have a *power* in the formal ***GURPS Powers*** sense. While its abilities can only manifest through objects, they aren't advantages with gadget limitations. Rather, the weird scientist's paraphernalia justifies the complex Accessibility limitation that is the Weird Science power modifier.

Weird Science

Source: Reality-warping weirdness field.
Focus: Artifact-based abilities.

You're attuned to the remarkable emanations of artifacts that cannot be explained by conventional science: alchemical concoctions, alien and extradimensional superscience, cosmic remnants, divine relics, magic items, psi-tech, spirit prisons, and so on. You can bend their energies to purposes other than those for which they were intended. The real limit on your power isn't the specific capabilities of these items, but the strength of your attunement to them – that is, how many points you spend.

Power Modifier: Weird Science. Your abilities rely on you schlepping paraphernalia charged with forces that defy science! These "focus objects" serve as triggers or power sources for your native gifts but *aren't* gadgets built on points; their intrinsic capabilities are what they are, continue to work, and don't affect ability cost. The limitation is that you must have one remarkable artifact per ability you hope to use; that article's form or function must be linked to your ability symbolically; and you must carry, wear, or wield the thing in its usual way to invoke the ability. For instance, if you purchased Damage Resistance with this limitation, it would work while you wore a magical breastplate and continue to protect you if you donned a superscience shield belt . . . but armor carried in a backpack wouldn't help you, and if all you had was a holy sword, you would be out of luck (although it would do for an *offensive* ability). You can swap equipment freely, but you can't rearrange *abilities* on the fly. Each modified advantage is fixed; it just happens that while it needs a piece of suitable gear to enable it, any such item will do. -10%.

> *Pinky, are you pondering what I'm pondering?*
>
> *– The Brain, in* ***Pinky and the Brain***

Weird Science Talent

5 points/level

This Talent gives +1 per level to success rolls for Weird Science abilities. As for any power Talent, the bonus benefits rolls against attributes, secondary characteristics, skills, and techniques to use the power's abilities – including those made to switch on, attack with, control, and defend with those abilities – but *not* damage rolls, reaction rolls, rolls required by limitations, or rolls made by the ability's target. It also has no effect on rolls for the focus object *as an artifact,* including rolls to use it, repair it, or avoid breakage.

At the GM's option, this Talent can assist rolls against Weird Science (p. B228) in the specific case of using that skill to analyze an artifact that would be a valid focus object for this power.

Weird Science Abilities

Any advantage that suits the theme of an available focus object *might* be an ability of this power. The GM is the final arbiter of appropriateness. He should ask, "Would I ever include an amazing item of this basic type in my campaign and have it possess a similar capability, even if *this* artifact does not?" If the answer is "yes," then the ability fits.

Some common examples:

- *Communicators* suit advantages like Telecommunication and Ultrasonic Speech.
- *Footwear* befits movement-related traits such as Enhanced Move and Super Jump.
- *Gloves* could permit abilities that enhance grip (notably Arm Strength) or fine manipulation (particularly High Manual Dexterity).
- *Helmets* might justify enhanced vision, hearing, or mental defense; e.g., Infravision, Ultrahearing, or Mind Shield.
- *Melee Weapons* are ideal for parrying or striking capabilities, most often Enhanced Parry or Striking ST.
- *Ranged Weapons* are a good excuse for ranged attacks – or at least Innate Attack.
- *Sensors* ought to enable sensory advantages, including almost any kind of Detect or Scanning Sense.
- *Shields,* from magical wooden bucklers to wrist-mounted force shields, symbolize blocking and resistance, allowing things like Enhanced Block and Magic Resistance.
- *Torso Armor* – including superscience force-field belts – rationalizes defenses that protect the whole body from harm, like Damage Resistance and Pressure Support.

As each focus object can channel only one advantage at a time, it's most economical to buy multiple traits that require the same basic class of thing as alternative abilities (***Powers,*** p. 11). Still, it's certainly possible to use several items of a particular type if you could normally carry, wear, or wield more than one simultaneously – and if you *have* more than one science-bending artifact of each kind! It's tricky to wear several helmets, magical or not, but a holy sword in either hand or two layers of superscience body armor might just work . . . if you're lucky enough to have a surfeit of such gear.

The above discussion considers only whether a particular ability befits a given item symbolically, in light of what such artifacts normally do in the setting. It's important for the player and GM to discuss rarity, too. Nobody would disagree that a communicator ought to suffice as a focus object for Telecommunication in *any* campaign, but in a TL3 fantasy game where the GM doesn't intend to give out communicators – not even to characters with an Unusual Background – that would be a waste of points.

Beyond symbolism and rarity, there's the matter of power level for advantages that come in levels – DR, Innate Attack, etc. – as noted in *Level Limits* (***Powers,*** p. 31). This is vital for any power in any campaign; below are some specific recommendations for Weird Science. Where a suggested limit depends on a property of the focus object, the weird scientist can *possess* whatever level he wants, but he can only *use* the level his artifact supports.

Allowed Focus Objects

What counts as a legitimate focus object is world-specific. The categories of "amazing artifacts" below often qualify, if with caveats. What's universal is that the GM must agree that the weirdness in question suits his campaign!

Alchemical Creations: If the Alchemy skill grants remarkable properties to a *lasting* item, then that object counts. This customarily means charms (***GURPS Magic,*** p. 220) or philosopher's stone (***Magic,*** p. 221), if that's a tangible artifact. Thus, weird scientists often learn Alchemy!

Cosmic Relicts: These include remnants of Creation, personal possessions of gods, and mythic wonders such as "the chariot that pulls the sun across the sky." While *incredibly* rare, they always qualify.

Holy Artifacts: Ordinary holy symbols *never* count, but items of divine power – whether given to mortals by gods or created through the sacred "enchantment" – are fair game. However, nothing stops a deity from revoking an artifact's powers, rendering it mundane and useless as a focus object! Weird scientists who are devout worshippers of the patron god of a craft have an edge.

Magic Items: Where these exist, they *always* qualify. In common-magic settings, most focus objects will be magical, and the most powerful weird scientists will be wizards or have wizard friends. In rare-magic settings, weird scientists will find Magery valuable for spotting suitable artifacts at antique shops, in old tombs, etc.

Psi-Tech: This only counts when the tech is genuinely *weird.* If it's mundane, like an EEG machine, or if the setting posits that ordinary science can analyze, enhance, and/or suppress psi, then too bad! Engineer (Psychotronics) can help distinguish various cases. ***GURPS Psi-Tech*** discusses these distinctions at length.

Spirit Objects: Anything with a spirit inside makes a good focus object. Ideally, the spirit is trapped; otherwise, it might leave, presenting a risk similar to that for holy artifacts. Objects of symbolic importance but without a supernatural charge (like a shaman's rattle) don't count.

Superscience: Merely being from a high TL, like TL8 in a TL3 world, isn't good enough. Neither is being from a divergent tech stream, like TL(1+2). To be weird enough to qualify, a technological creation must defy rational science. In game terms, this means it sports a "^" as or on its TL.

Things from Elsewhere: Certain worlds, times, or dimensions, or realms outside reality, might support the existence of objects with bizarre properties. The distinction between these and cosmic items is that they're mundane at home but weird in the PCs' world, while cosmic relicts are *always* remarkable. This implies that such things might not work as focus objects where they came from – a challenge for time- and dimension-travelling weird scientists.

Weird for Weird's Sake: The GM can allow whatever he likes, even oddities that manifest no unusual powers, like the Crystal Skull or Spear of Longinus – their uniqueness and the collective power of human imagination might suffice! Hidden Lore (Conspiracies) comes in handy here.

Animated Constructs: Build these as Allies (Minion, +0%; Weird Science, -10%) with point totals no greater than your own. They can include any synthetic entity (e.g., a golem) or vehicle (e.g., superscience UFO) animated through means other than rational science, provided that it's under your complete personal control, possesses the ability to receive orders from you (verbally or mentally), and is capable of traveling to you under its own power when not in your presence. These extra conditions balance the fact that such abilities can operate without the focus object being carried on your person. This is a special exception to that rule!

Attribute Bonuses: Direct bonuses to ST, DX, IQ, HT, Will, and Per – whether fully general or special-purpose – cannot exceed 1/3 of your personal score, rounded down. Use Will for all forms of resistance bonuses and Per plus natural Acute Senses for each sensory bonus. For instance, ST 13 could justify Arm ST 4 through sleeves or Striking ST 4 through a sword; DX 11 would allow High Manual Dexterity 3 through gloves; Will 12 sets a cap of Magic Resistance 4 through a shield or Mind Shield 4 through a helmet; and a Vision roll of 16 enables up to Acute Vision 5 through goggles.

Damage Resistance: Levels of this trait can't exceed 1/2 of the *basic* DR of the torso armor or force screen used to rationalize it. Particularly in low-tech settings, this gives weird scientists a reason to seek out and wear heavy armor. However, DR bought this way protects the *entire body,* not just the torso. If you have DR 3 as an ability and don a plate corselet with DR 6 but no other armor, your torso has DR 9 and the rest of your body has DR 3.

Enhanced Defenses: Channeled through shields (Enhanced Block), melee weapons (Enhanced Parry), or footwear (Enhanced Dodge), the maximum is a flat three levels.

Innate Attack: In settings where weapons are mainly muscle-powered, start with the weird scientist's ST, increase it by 1/3 (rounding down), and find swing damage for this ST. That's about as much Innate Attack as is balanced. For instance, a ST 11 weird scientist would use swing damage for ST 14, or 2d. However, this attack can be melee or ranged, deliver any damage type, have modifiers (like Accurate, Affects Insubstantial, Armor Divisor, Hazard, and Increased Range), and doesn't consume ammo. If the focus object sets its own damage, like a gun, then increase this by 1/3 to find the limit; e.g., a pistol that does 2d+2 pi could justify Innate Attack up to 3d+1, which might be burning, bypass DR with Cosmic, and so on.

Movement Abilities: These should allow a top speed that's at most *double* the user's Basic Move.; e.g., Enhanced Move 0.5 or 1 (Ground; Weird Science, -10%) [9 or 18], Flight (Weird Science, -10%) [36], or Super Jump 1 (Weird Science, -10%) [9]. If the setting has lots of fast vehicles, the GM might review the top ground speed for these and allow enough of a boost that someone with Basic Speed 5.00 and Basic Move 5 could keep up.

The Weird Science Skill

Weird scientists never *have* to learn the Weird Science skill – in fact, unless their power Talent adds to that skill, there's no special incentive to do so. As *Allowed Focus Objects* (p. 5) points out, many other skills and abilities are more practically useful. Optionally, the GM can use some or all of the following suggestions to give that skill a larger role among those who possess the eponymous power.

Enhancing Abilities: If an ability expressly aims to detect or modify something that meets the criteria for a focus object, then a Weird Science roll replaces the attribute roll that the underlying advantage normally requires. Weird Science can also stand in for the rolls required by *Temporary Enhancements* (***Powers,*** pp. 172-173) and *Using Abilities at Default* (***Powers,*** pp. 173-174), if the GM allows those rules. Indeed, the GM might wish to permit these options to weird scientists even if he otherwise doesn't use them, as the kind of tinkering they represent is a perfect fit!

Extra Effort: When nursing extra effort out of abilities, the weird scientist is using his knowledge of the focus object to tinker with it on the fly. Thus, instead of a Will roll, he makes a Weird Science skill roll – and this is based on the artifact's HT instead of the user's IQ, to reflect the risk of pushing too much power through the thing. See also *Extra Effort* (***Powers,*** pp. 160-161).

Improving the Power: Adding Talent or an ability, increasing the level of an existing ability, or enhancing an ability or removing limitations from it requires a successful roll against Weird Science. This is meaningful only if following the advice under *Improving Existing Powers* (***Powers,*** p. 34) and permitting just one improvement per game session. In that case, failure means the points can't be spent, and the player must make do with his PC's existing capabilities until next game session. If using *Discovering New Abilities* (above), the Weird Science roll involves analyzing the new artifact, and is subject to any modifiers the GM would normally apply for such analysis.

Restoring Crippled Abilities: If for some reason an ability is disabled, Weird Science rolls can hasten recovery just as Physician skill does for crippled body parts. For more on crippling and recovering abilities, see *Crippled Abilities* (***Powers,*** p. 156).

If the GM does go this route, Weird Science Talent should add to skill for these rolls and perhaps in general.

Optional Rule: Discovering New Abilities

The GM may require that before a weird scientist can buy a new ability, he must acquire a new focus object suitable for it. This keeps power levels under control *and* explains why such people seek out and collect amazing artifacts. The time and expense this implies also make the power modifier a little more meaningful, as players tend to be protective of their PCs' gear, and it's rather unlikely that a weird scientist will ever *really* be without his abilities.

About the Author

Sean "Dr. Kromm" Punch set out to become a particle physicist in 1985, ended up the ***GURPS*** Line Editor in 1995, and has engineered rules for almost every ***GURPS*** product since. He developed, edited, or wrote dozens of ***GURPS*** *Third Edition* projects between 1995 and 2002. In 2004, he produced the ***GURPS Basic Set,*** *Fourth Edition* with David Pulver. . . and the list keeps growing. He lives in Montréal, Québec with his wife.

Dangerous Concoctions

by Rev. Jason "PK" Levine

In the tower, far afield from the King's castle, the alchemist danced and laughed. The elixir worked! It ***worked!*** *The weasel had doubled in size, and darted around its cage with speed and grace. Luwin couldn't wait to see what happened when his grace's horses were fed the potion with their morning oats. Just imagine! Destriers with the strength of oxen and the speed of the hawk. Surely this would usher in at least a century of rule. Luwin was so excited, that he didn't notice the cage's tendons tearing as the weasel slammed against the door repeatedly, its mouth frothing, its eyes fixed on Luwin's throat . . .*

"Sir, you must remain calm," Dr. Thibeault assured his patient. "I assure you, this solution will relieve your malady. Your vision will be as bright and clear as the sun itself." The man relaxed – if he couldn't trust one of the greatest minds of the 19th century, who could he trust? Dr. Thibeault administered the injection, then applied the electrical shocks required to fully catalyze the process. Within moments, the patient's cataracts were receding – success! That is, until the whites of his eyes began turning red, and a massive hump began growing from his back. "Damn it," Thibeault cursed, as the patient screamed. "I could have ***sworn*** *I fixed that side effect with this batch."*

The three scientists had grown used to working in zero-G. It was necessary for the proper formation of certain protein structures, and part of the reason their research was conducted on the space station. Jan was examining the final batch of what they hoped would be a true panacea – a wonder cure – as Kelly walked over. "Jan, have you seen the hypotheticals on this virtual simulation? There's a 3% variance in the way the nanovirus interacts with junk DNA."

"And? You just said it yourself. It's junk DNA. And the genetic therapy hypotheticals speak for themselves! We'd be idiots not to move on to subject testing."

Kelly sighed, "I can't disagree. But are you sure it's safe to work with anything we don't have 100% control over?"

Jan smiled, "You worry too much. This isn't the Dark Ages – it's modern science! We ***know*** *what we're doing."*

Scientists, doctors, and their equivalents have always dreamed big. Surely there exists a drug that can make a man as strong as a bear, as smart as a sage, or as enduring as a mountain! And when they find such a thing, aren't a few questionable side effects worth that price?

The concoctions in this article can be used in any setting (and any TL). In a medieval game, they may be alchemical elixirs. In a steampunk setting, they make excellent medical tinctures. In a far-future campaign, they can be proteus nanoviruses. Tweak the (faux-Latin) name and the delivery method, and you have something ready to inflict on the PCs – or to add to a mentally unstable NPC for a potentially dangerous scenario.

The campaign setting and TL influences two key statistics:

Cost: Each concoction includes a *MPM* value, short for "monthly pay multiplier." To find the retail cost of each dose, multiply this fraction by the average monthly pay (p. B517) for the campaign's TL. For details on how this was calculated, see *Custom Formularies* (p. 9).

Weight: As a general rule, potions weigh 0.5 lb. while drugs weigh a negligible amount. For bulk drugs, assume 30 drinkable or injectable doses or 500 pills per pound. (Injectable drugs at TL8+ include syringe weight; at earlier TLs, they do not.)

What's In a Name?

To avoid repetition, this article uses the terms "drug," "brew," "potion," "tincture," and "concoction" interchangeably. In other words, don't read too much into the terms used – anything described as a "drug" works equally well as a "potion" or "tincture" and vice versa.

Take Your Medicine

As a nod to realism, injections take effect within 1d seconds, drinkable liquids within 1d×5 seconds, and pills within 1d minutes. If the GM prefers a more cinematic spin, assume that *all* concoctions start working one second after you take them!

Every example gives a duration, either fixed, random, or based on the subject's HT; this is the duration of the *positive* effects of the drug. There may also be *side effects.* Upon taking a dose, you must immediately make a HT roll. Certain traits may affect this roll; the GM must decide based on how he is interpreting these concoctions. (For example, if they are alchemical potions, Magic Resistance and Magic Susceptibility may affect your HT roll, while for physiology-enhancing chemicals, Fit and Very Fit may apply.) The effects of this roll determine how long you experience the listed side effects.

Critical success or success by 10+: You experience no side effects!

Success by 0-9: Subtract your margin of success from 10 and then multiply that result by 10%. This is the proportion of the duration during which you suffer from side effects. The *positive* effects of the concoction are unaffected.

Failure: Add 5 to your margin of failure and multiply that result by 20%. This is the proportion of the duration during which you suffer from side effects. The *positive* effects of the concoction are unaffected.

Critical Failure: As for failure, but you *only* experience side effects – the brew offers you no positive effects at all. As well, immediately make a *second* HT roll; on a second critical failure, the side effects are *permanent!*

Example: Kirsten swallows a Provisum pill as her team sets up an ambush. The GM rolls 2d for the duration, resulting in seven hours. Kirsten rolls against HT and succeeds by 4. This means the side effects last for 60% of the duration, or 4.2 hours. Thus, for the next 4.2 hours, Kirsten has Telescopic Vision 2 *and* Epilepsy, and then for another 2.8 hours (the remaining duration) she has *just* Telescopic Vision 2.

If you already have one of the listed disadvantages, the side effect makes it worse; the GM will add the point values together and use that to estimate the new level or self-control number. If that's not possible, then you can *effectively* ignore that one side effect – you're already so crazy or broken that you can't get any worse!

The Pharmacopia

See *Custom Formularies* (p. 9) for advice on creating your own dangerous concoctions.

Anatavistol

Duration: HT×30 minutes.
MPM: 2.1.

This injection is intended for animals – but in a cinematic game, it should work equally well on people! It raises the creature's IQ (but not Will or Per) by 4 *and* removes the Bestial disadvantage. All of this tinkering with mental acuity is dangerous, however. As a side effect, the subject's animal instincts are subverted into Bad Temper (6), Jealousy, and Uncontrollable Appetite (Murder) (6).

Bonanox

Duration: 8 hours.
MPM: 0.01.

This concoction is given as a remedy for sleepless nights, granting the Deep Sleeper perk. (It isn't strong enough to counteract the effects of Insomnia or Light Sleeper.) The side effects – Pyromania (15) and Sleepwalker (15) – are fairly mild, with reasonable self-control rolls, which means this inexpensive cure may be given to *many* people before buildings start burning down in the middle of the night.

Ediscor

Duration: HT/2 days.
MPM: 0.1.

Anyone under the effects of this (particularly long-lasting) drug has Eidetic Memory, which allows him to recall details with ease. (If he already had Eidetic Memory, it is upgraded to Photographic Memory.) The side effects take this even further, manufacturing memories – specifically, imagined wrongs and slights – that produce Paranoia. In a subject predisposed to anger or violence, this can lead to a tragic tale of meaningless revenge.

> *Science and art are only too often a superior kind of dope, possessing this advantage over booze and morphia: that they can be indulged in with a good conscience and with the conviction that, in the process of indulging, one is leading the "higher life."*
>
> *– Aldous Huxley*

Ossiumax

Duration: 1 hour.
MPM: 0.5.

The subject's spine and shoulder bones reshape themselves to support a heavier load, granting Lifting ST 5. If the side effects kick in, this reshaping goes too far, turning his posture into a twisted parody of itself: Add Hunchback (which prevents existing clothing or armor from fitting properly) and give his arms No Physical Attack (see *Modifying Beings With One or Two Arms,* p. B53). The sight of this happening the first time is enough to force a Fright Check in most onlookers!

Provisum

Duration: 2d hours.
MPM: 0.1.

Under the effects of this drug, the lenses in the subject's eyes achieve remarkable focus, allowing him to see with the effects of Telescopic Vision 2. Unfortunately, as a side effect, this can cause light to *strobe* enough to inflict Epilepsy. Still, the cost is low enough that it may be worth it to a desperate sniper. With luck, his hand won't be on the trigger when he seizes up . . .

Raptusalus

Duration: 1d×HT minutes.
MPM: 1.76.

This tincture drastically speeds up the body's healing process by supercharging his endocrine system. The subject gains Regeneration (Fast), healing one HP per minute for the duration. The empowered hormones can overpower his sense of decency as a side effect, however, resulting in Impulsiveness and Lecherousness – with no self-control roll for either!

Vextundolox

Duration: 1d+1 hours.
MPM: 2.

The subject's brain is rewired, helping him easily visualize the way components can come together into a unified whole; in effect, he gains Quick Gadgeteer. The benefits apply to his Concept *and* Prototype rolls (p. B476), assuming the duration lasts long enough – this is guaranteed for Simple or Average gadgets and likely for Complex ones, but unlikely for Amazing devices. As the utility of this drug cannot be overstated, inventors everywhere will be clamoring for it!

The side effects are subtle and insidious. The inventor gains Callous, Compulsive "Upgrading" (with no self-control roll), Delusion ("I am building to my original design!"), and Megalomania. While under the side effects, he'll twist his intended design into something suitable for a proper world-conquering villain – stun guns become death rays, healing beds mutate their patients, and so on – but the Delusion prevents him from realizing what he's doing. When the side effects wear off, he will resume building the device properly, without remembering the dangerous bits he added.

The GM must adjudicate what this actually *does* to the device, based on how badly its design was twisted. This can be estimated as a percentage. If the Concept roll was made while under side effects, the gadget is automatically 50% flawed. The remaining 50% comes from building the prototype; divide the duration of the side effects by the length of time needed to build the gadget, and multiply by 50% (maximum 50%). Add these two percentages together, and use the sum as a benchmark.

Example: Morgan takes a dose of Vextundolox just before working on a Complex invention: a cancer vaccine. The GM rolls a duration of five hours; unfortunately, the scientist's HT roll only succeeds by 6, which means he experiences side effects for the first two hours of work. His vaccine takes four hours to make (the GM rolled 1d), which means that it's 75% flawed: 50% from the Concept roll and (2/4)×50%=25% from the Prototype roll. The GM decides that 3 out of 4 people who take the vaccine are protected from cancer, but must *also* roll each time to avoid acquiring -10 points toward Slave Mentality . . .

The Delusion ensures that the inventor won't realize the problem, even if he tests the product afterward. Any assistants, however, can make normal rolls to realize that something is amiss!

About the Author

Rev. Jason "PK" Levine has experimented with alchemy, electroshock therapy, nanoviruses, and acupuncture – sometimes all at the same time. Between patients, he acts as the Assistant ***GURPS*** Line Editor and writes books that usually involve *at least* a touch of mad science. He lives in northern Georgia with his few surviving family members and a menagerie of future uplifting experiments . . . er, *pets*. Yes, that's it. Pets.

Custom Formularies

It's easy (and recommended!) for the GM to introduce new concoctions to the game: Simply select the advantage(s) that the drug will provide, then choose disadvantages (as side effects) strong enough to *at least* balance the advantage point cost. For example, a brew that grants High Pain Threshold [10] requires disadvantages totaling -10 points or worse. If a disadvantage that *normally* offers a self-control roll does not offer one, multiply its value by 2.5.

To calculate the MPM, first multiply the advantage point cost by 0.04. If the disadvantages exactly balance the advantages, stop there; otherwise, multiply the disadvantages' *excess* (which will be a negative number) by 0.02 and add it to the MPM. This cannot bring the MPM below (advantage point cost)×0.01.

Example: The GM is creating a new TL5 tincture that grants Enhanced Time Sense [45]. He thus needs to add at least -45 points worth of disadvantages; he chooses Berserk (no self-control roll) [-25], Cannot Speak [-15], Dyslexia [-10], and Non-Iconographic [-10], a total of -60. The MPM starts at 45×0.04=1.8 because of the advantages. The disadvantages exceed the advantages by -15 points, however, which adds -15×0.02=-0.3. The final MPM is 1.5. Because the typical TL5 monthly pay is $1,100, each dose will cost $1,100×1.5=$1,650.

The duration of the drug should be kept to a reasonable limit (based on similar science or pseudo-science in the campaign), but does not affect the MPM. Increased duration means increased side-effect duration, after all! Sometimes the worst possible compromise is swallowing a three-hour pill when you only need its positive effects for the next few minutes . . .

The calculated MPM should produce reasonable "wonder drug" prices in most campaigns. However, if the GM wants these drugs to be more or less expensive, he shouldn't hesitate to change things! The simplest way is to use the MPM formula above, but with a different value in place of typical monthly pay. For example, if the GM above wanted cheaper drugs in the game, he could multiply each concoction's MPM by $500 instead of the $1,100 suggested for TL5.

Eidetic Memory

Red Science

by David L. Pulver

The Soviet Union and Russia Federation are known more for reliable mass-produced technology than weird science. Under Stalin, deviating from scientific orthodoxy – even if the orthodoxy was itself little more than mad science, as in the case of Lysenko's biology – could easily get you executed or sent to a chilly Siberian exile. Some of the best mad scientists of Slavic ancestry emigrated to America, where eccentricity merely resulted in suppression of your theories by the Moneyed Powers rather than a bullet in the head.

In the post-Stalin era, the practice of weird science was less dangerous to one's health (unless you blew yourself up with your own experiment, but that was a standard problem). The more recent decline of Russia from super-power status has made it harder to get funding, with only a few weird-science projects really getting off the ground. Many genius inventors have instead struggled to support their science or been forced to prostitute their genius to Russian Mafia bosses, international arms dealers, or rogue states.

Despite these obstacles, modern Russia has had its share of eccentric weird-science projects. Its leadership in the field of psychotronics (see ***GURPS Psi-Tech***) is too well known to discuss here, but the post-communist spirit of *perestroika* and the enterprise of Russia's tabloid journalists have exposed the truth of other superscience projects once thought lost or abandoned during the Soviet era. Indeed, as the Russian military has continued its slow transformation from a massive army to a smaller and more agile force under the bold leadership of Vladimir Putin, a trickle of funding for new, highly advanced projects has come through. Yet none of these are more bizarre than the secret history of the substance known as . . . red mercury.

Doomsday device? Ah, now the ball's in Farnsworth's court!
-Professor Farnsworth, ***Futurama*** *#3.14*

The Quest for Red Mercury

In the 1980s and 1990s reports began to appear in the Russian and later international press of a mysterious substance called "red mercury" that was being used by Soviet and later Russian scientists in their defense technology and aerospace programs. It was said to have unusual industrial properties that made it useful in the production of nuclear bombs, possibly allowing fusion weapons to be created without a heavy fission trigger. Reports in Russian newspapers such as *Pravda* indicated it had even more exotic properties associated with superconducting research and stealth technology.

The exact nature of red mercury was obviously highly classified. Theories included irradiated mercury, the rare isotope lithium-6, an obscure superconducting ceramic, or even the cynical concept that the whole thing was a hoax dreamed up by the tabloid press or authorities to smoke out would-be nuclear-material black-market arms dealers. According to some sources, development in the initial post-Soviet era was assigned to a shadowy Moscow-based corporation operating under the name Promekologia, which coordinates military-industrial use of the remaining stocks of the material.

After rumors of this substance's existence appeared in Russia in the 1980s and its utility as a shortcut to nuclear weapons, a variety of rogue states, intelligence agencies, and terrorist organizations attempted to acquire it. At least three South African chemists and arms dealers came to grief in the early 1990s trying to sell allegedly stolen samples to Middle Eastern clients. North Korea imported both beryllium and red mercury from sources in Russia in 1993 with the help of the Russian Mafia. Perhaps this red mercury – if not a hoax – may have been a trigger for North Korea's atomic bomb.

There were even reports that ex-Bosnian Serb leader Radovan Karadzic attempted to purchase a Red mercury mini-nuke in 1995 for use against his enemies in the Bosnian War, but was swindled out of $6 million instead. Similar fates befell various low-level Al-Qaeda agents who often ended up purchasing ordinary mercury, iodide of mercury, or just red dye or powders, sometimes salted with heavy metals or low-grade uranium.

Despite the hoaxes, the demand for red mercury continued. In the last 10 years, prices on the black market have been quoted ranging from $50,000 to $4 million per pound. In 2002, the Tamil Tigers terrorist group of Sri Lanka attempted to acquire a quantity of red mercury for weapons of mass destruction. In Britain in 2004, several men were arrested on suspicion of trying to get red mercury.

Red mercury has become part of the urban folklore of the Middle East. Besides its utility in making a "Suitcase from Allah" that can blast the infidels to Hell and back, it seems to have become conflated with various folk remedies and alchemical legends related to actual mercury-based compounds. Arab urban legends have claimed that even a small quantity of red mercury can be used to locate buried treasure, ward off evil spirits or control jinn. Reports in 2009 that traces of red mercury had contaminated a shipment of sewing machines sent to Saudi Arabia encouraged hundreds of people to try and purchase them for as much as $50,000 in order to extract the valuable substance or to burglarize tailors in the hopes of acquiring them. After a rumor went around that radiation from the red mercury would interfere with cell-phone reception people held their phones next to suspect sewing machines in the hopes of not getting a signal. The Saudi police investigated and claimed it was all a hoax.

Is it a hoax? Or was there something about the substance that induced this sort of bizarre behavior? The truth of red mercury lies in the twilight zone between science and fiction, with roots that go back deep into the Soviet era. About seven miles deep, to be precise.

The Kola Superdeep Borehole

The Kola Superdeep Borehole was a geological science project of the Soviet Union that was initiated in 1962. It was established in the Kola Peninsula north of the Arctic Circle (in the Murmansk oblast). Part of the Baltic Shield, the peninsula is rich in various minerals, including exotic rare-earth elements and nonferrous ores.

The project was managed by the Interdepartmental Scientific Council for the Study of the Earth's Interior and Superdeep Drilling (GNPP Nedra). This was a high-prestige effort – an unprecedented descent into the depths of the earth, a form of time travel back to unimaginably ancient eras. The Americans had earlier tried and failed at a similar deep-drilling project. Now it was the turn of the Soviet Union to show the West what Communism could achieve: a subterranean "inner space" program that would engage the greatest mining engineers and geological scientists of the Soviet Union.

The goal was to penetrate deep into the planet's crust in order to extract samples from the little-understood Mohorovicic discontinuity ("Moho") where the crust and mantle meet. It took several years of planning and construction to begin drilling. The facility became operational in 1970 and continued to drill for 24 years. Then it was shut down. During its period of operation, it was the deepest manmade hole ever sunk into the earth.

The primary drilling apparatus – the Uralmash-4E and Uralmash-15000 series drilling rigs (manufactured by a company also known for its armored fighting vehicles) – were housed in a 200'-tall structure attached to a large complex that included 16 geological and chemical laboratories. Since a conventional rotating drill shaft was impractical with a hole that was to be several miles deep, a unique system was devised in which only the drill bit, rather than the entire drill, was rotated. To manage this, pressurized lubricant was pumped down the drill shaft to cause the bit on the end to spin.

The Superdeep Borehole comprised a number of holes that branched off from the main shaft, but the major bore, "SG-3," was 9" wide and 7.5 miles deep. This was a major accomplishment in itself. Even so, after a generation-long effort, the drill was halted in 1994 when it was a mere 1.7 miles short of its original goal of penetrating the Moho. The stated reason for stopping was far higher than predicted temperatures as the bore went deeper, up to 356°F at the 7.5 mile mark. Drilling lubricants and machinery could not function in an environment so hot that the very rock flowed like liquid plastic.

Moria! Moria!
Wonder of the Northern world. Too deep we delved there, and woke the nameless fear.
– J.R.R. Tolkien,
The Fellowship of the Ring

At least, that was the official explanation. Over time other stories came out of Kola: stories of mysterious accidents or explosions in the depths, of strange gasses venting out, of bizarre behavior by scientists and engineers, sudden injuries or deaths from those handling the bore or the core samples, the rapid deployment of MVD, KGB, or Spetsnaz GRU troops to the site, even reports of engineers who worked on the project hearing terrible screams – like the cries of damned souls – issuing from its depths. The latter incident may be connected to overworked geologists and engineers who had breakdowns or stress-induced hallucinations – but what triggered these breakdowns?

Although the Kola Superdeep Borehole shut down before it reached its planned final destination, it was nevertheless acclaimed a success. The facility continued operating with side drilling projects for a further seven years afterward, until 2003. Numerous geological discoveries were made from core samples taken during the drilling operation, some of which were a staggering 2.7 billion years old. The project determined the deep geological structure of the Baltic Shield rocks, and the nature of physical, chemical, and thermal layers in Earth's crust. Additionally, 25 new species of exotic microscopic fossils were found as deep as four miles below the surface. By any measure, it was a triumph of Soviet science . . . yet its greatest success was never made public.

This was the discovery of a primeval material of unparallel value to Soviet science, a mysterious and hitherto unknown elemental substance found in 2.5-billion-year-old rocks that dated back to the Archean Eon . . . a period so ancient the sun itself possessed a different luminosity. This substance, which exhibited exotic superconducting and high-energy properties hitherto never observed in nature, was given the name "red mercury."

Red Mercury

The origin of red mercury in the depths of Kola Superdeep Borehole is not publicly known outside of inner circles in the Russian government and military-industrial complex. Indeed, the very name "red mercury" is actually a historical term for the compound mercury iodide – a classic Soviet *maskirovka* intelligence deception. This bit of misdirection confused many into thinking the material has something to do with the element mercury, which it does not, sharing only the latter's high density and, to some extent, its toxicity and fluidity.

First refined from Kola deep-core rock samples in the 1980s, red mercury is actually an extremely versatile substance with a variety of industrial and military applications. It is a super-conductive, high-energy, high-density material used for producing high-precision conventional and nuclear bomb explosives. It is believed to be ballotechnic (meaning it reacts very energetically when subjected to shock compression at high pressure).

Red mercury's extreme volatility even in its raw state was apparently discovered early on when the high-pressure drill caused the material to react, resulting in an explosion that inflicted serious damage to the Kola Superbore's main drill. Investigation into the causes of this blast and the nature of the material that produced it, as well as efforts to mine it, came to dominate the Kola Superbore project, and was the real reason behind its shutdown and the layers of mystery that surrounded it. Those geologists who opposed this change of focus quietly disappeared or, more often, ended their days in mental hospitals in Siberia. In fact, several engineers and scientists did legitimately go crazy during the project, mostly due to exposure to vapors produced by the substance before its true nature was understood.

Over a seven-year period, several tons of the substance were extracted up the borehole at great expense and subjected to a sophisticated refining process. The original material-core samples were heavy, of a dark reddish-black color. Geologists testing it at the Kola borehole labs and later in Moscow referred to as the "red core substance" (*krasnyi osnovnye veshchestva).*

The exact details of how the original red-mercury cores were processed and stabilized are still highly classified – although it undoubtedly cost several lives – but the final refined product is a cherry red gel-like semi-liquid substance with a density 23 times that of water. It can serve as a liquid explosive of surpassing power, and can also be used as a form of room-temperature superconductor.

Several applications of weaponized red mercury are detailed below.

Red Mercury Explosive (TL8^)

The primary use of red mercury is as a powerful explosive charge some 100 to 400 times more powerful than TNT. Usually only a few ounces are available due to its rarity and expense. Nevertheless, the high explosive yield of even a small quantity can make it a potent weapon. Conventional explosive sniffers or scanners, bomb sniffing dogs, etc. are not normally set up or trained to detect red mercury. However, its high density means it shows up well on X-rays. It can also be detected in searches for liquid explosives. It has REF 400, which means a pound of red mercury will inflict 6d×40 cr ex damage. $50,000, LC0.

Explosive Red Mercury (VKR) Projectiles (TL8^)

Known as VKR (after the Russian abbreviation for Explosive Red Mercury), these are explosive warheads that have replaced a conventional charge with red-mercury filler.

The employment of red mercury increases both the tamper and the neutron reflectibility of the bomb. Further, red mercury explodes with such amazing energy that it can be used to surround fissionable or fusionable material, compressing it to a higher density as it explodes. Red mercury delivers all three necessary qualities of atomic miniaturization.

– Henry Stevens, ***Hitler's Suppressed and Still-Secret Weapons, Science and Technology***

A variety of these warheads were developed by the Soviet and later Russian militaries as experiments after the discovery of red mercury, though only a few entered very limited serial production. These seem to have been acquired by a few elite black ops units in Russia, mainly Spetsnaz KGB and GRU teams. Larger caliber examples – e.g., in missiles or tank rounds – were distributed to a few experimental or elite tank and aviation units. A few have made their way onto the international black market through corrupt military or governmental authorities with ties to the Russian Mafia.

To create a VKR warhead multiply the crushing explosive damage of any TL7-8 explosive-energy projectile (see ***GURPS High Tech,*** p. 169) by ×5 to ×20 depending on the density and purity of the red-mercury filler; a ×10 multiplier is typical.

For gun ammunition, multiply the projectile's usual CPS by 5,000 *and* the usual multiplier for the type of round in question – e.g., a round of armor-piercing explosive (normally triple cost) as a VKR projectile would be 15,000 × the usual cost. For rockets and homing or guided missiles, instead multiply cost by 500 for rockets and 200 for missiles. VKR projectiles are LC0, except for rounds smaller than 15mm, which are LC1.

Some calibers or weapons that VKR projectiles were manufactured for include the following.

RPG-7KR: The RPG-7KR was a variant of the venerable RPG-7 (see ***GURPS High-Tech,*** p. 148): an anti-tank rocket launcher fitted with a powerful VKR-HEAT round and improved sights. It was intended for Spetsnaz GRU infiltration teams to use to destroy high-value strategy targets, such as NATO defense headquarters, port facilities, docked ships, hardened aircraft shelters, or nuclear-weapon storage facilities. Damage 6d×40(10) cr ex with linked 7d×20 cr ex, Acc 2+2 (plus Night Vision), Range 10 (minimum)/1,000, Weight 19/5, RoF 1, Shots 1(4), ST 9†, Bulk -7, Rcl, 1, $2,300 for launcher (plus $75,000 per VKR rocket). Use Guns (LAW) to fire it. There is a hazardous backblast directly behind the weapon when fired, doing 1d+2 burn damage.

9×18mm Makarov: This Soviet-era automatic pistol cartridge (see ***GURPS High-Tech***, p. 100) was designed with a special semi-armor-piercing high-explosive bullet containing a tiny drop of red mercury and a delayed-action fuse. A few dozen to a few hundred rounds seem to have were made, mainly for assassination missions by elite KGB and GRU agents. It inflicts ordinary bullet damage plus a follow-up attack inflicting 4d cr ex damage. The explosion will occur inside the victim's body if the bullet inflicts penetrating damage (×3 wounding modifier), often enough to literally blow a man apart. Red-mercury bullets are usually available individually rather than in large quantity and are typically custom-loaded. In some older bullets, a 1d+1 second delay is built into the follow-up damage to allow the shooter to get clear. Manufacturing price was $2,000 *per bullet,* but black-market prices can be higher. The round is often fired from the Izhemkh PB silenced pistol (-3 to hearing rolls to notice the shot, though, of course, everyone will hear the ear-splitting blast when the red-mercury explosion goes off). Damage 2d-1 pi + follow-up 4d cr ex, Acc 2, Range 80/800, Wt. 2.4/0.3, RoF 1, Shots 8+1(3), ST 8, Bulk -3, Rcl 2, $600, LC2. Some versions of the pistol were made of *krasnium* (see *The Red Metal,* below) to further assist assassins.

125¥408mmR: The standard Russian tank-gun projectile. About 80 experimental warheads were made, mostly allocated to special test units. In 2007, warheads drawn from surviving stocks of the warheads were issued two per robot to the "Red Bogatyr" teams in sensitive areas on the Georgian and Chinese borders. Use the statistics of the Motovilikha D-81TM cannon- (p. 140 of ***GURPS High-Tech***) but with 10× cr ex damage.

The Red Metal

Red-mercury cerametals are used in creating the weird-science alloy *krasnium* (the "red metal") detailed in ***GURPS Warehouse 23***. Normally as hard as steel, it is water-soluble within minutes of exposure to H_2O, allowing for disposable armaments, bullets, or other all-metal objects. The main users were Spetsnaz GRU teams and assassins, though the KGB and its successor, the FSB, likely acquired some krasnium devices. Krasnium items are 5× normal cost to manufacture and many times more expensive on the black market.

Exorcisms

There is a faint possibility that the rumors are true, and red mercury in powdered or liquid form can indeed drive off demons or jinn (Arabic spirits). If so, treat contact with the material as the equivalent of holy water and/or silver.

Kola Deep Bore Today

The Kola Superdeep Borehole and its associated geo lab were finally shut down in 2003, although the empty shell of the facility and the holes itself still remain. This occurred after all red-mercury deposits were apparently extracted from the primary site with remaining stocks of the substance held elsewhere under lock and key or used up. The Russian government and various oligarchs aware of the secret continue to seek a new source of red mercury. It is possible that some of the deep bores in Sakhalin-I oil and natural gas drilling project at Sakhalin island in the sea of Okhost may be a cover for such a venture.

Red-Mercury-Triggered Nuclear Warhead (TL8)

The most feared application of red mercury is its use as a trigger for a very small nuclear weapon, with mininukes (see ***GURPS Ultra-Tech,*** p. 156) as little as grenade size (40mm diameter, normally TL11+) manufactured as early as TL8. These weapons were designed at Russia's Kurchatov Institute in Moscow, whose heavily guarded underground vaults may also hold some of Russia's known supply of red mercury.

The primary application of the weapon is the notorious "nuclear hand grenade" first issued to an elite unit of Spetsnaz GRU troops in 1990. Somewhere between 20 and 200 of these devices were believed to be built.

RDS-667 Nuclear Grenade (TL8^): This is a baseball-sized 0.01 kiloton nuclear weapon using a few ounces of red mercury as a trigger to detonate a nuclear warhead.

Despite being only 3" in diameter, it weighs 10 lbs., thanks to the high density of the red-mercury core. It is equipped for remote or time-delay detonation. Due to the relatively low yield, it lacks most of the sophisticated safety systems used on larger nuclear weapons (instead requiring a manual key insert to arm it). The nuclear grenade inflicts 6d×200 cr ex damage plus linked 4d×200 burn ex damage with the radiation and surge damage modifiers. Burning explosion damage is divided by distance from the blast center, rather than 3 × the distance. 10 lbs., $50,000,000. LC0.

Like other nuclear weapons, red-mercury warheads have a particular signature. Microscopic spectrometry analysis of elements and isotopes in the debris near the blast site (such as fused glass created by the heat) can identify an explosion as having been caused by a red-mercury warhead.

A few older examples of these weapons have been known to have degraded, resulting in slow leakage of red-mercury vapor (and other isotopes) from their core. As a result, only a 50% chance exists for a nuclear explosion (Malfunction 11). If it fails, the conventional charge of 4 lbs. of red mercury will instead inflict 6d×80 cr ex.

The leaking red-mercury vapors may also have other effects (p. 11) . . .

Plasma Stealth

The unusual superconducting properties of red mercury were also used in another top-secret Russian program: the development of plasma stealth. This technology – at the bleeding edge between weird science and real science – surrounds a vehicle with a glowing halo of ionized gas (plasma) designed to absorb radar waves. It may have been inspired when Soviet scientists observed the unusual radar effects produced by the naturally-occurring plasma shell that surrounded the Sputnik satellite when it was traveling through the ionosphere.

Plasma stealth was developed at Russia's Keldysh Research Center. Some reports claim a 200 lb. generator could reduce a fighter-sized vehicle's radar cross section by a factor of 100 without the need for a highly complex stealth configuration – which, without vastly expensive design processes, often involves aerodynamic compromises – and costly radar absorbent materials (RAM). In addition to its use on combat aircraft, plasma stealth has an obvious utility for flying mecha, since their humanoid shape is not amenable to ordinary stealth technology. The Ke-7 plasma-stealth generator was thus a perfect installation for Russia's new flying war robots . . .

Plasma Stealth (TL8+1): This option is available for any sealed vehicle or sealed suit of armor. It ionizes atmosphere to generate a low-temperature precisely controlled plasma-field "aura" along the surface of the armor. This field can absorb the electromagnetic energy of hostile radar or causes it to bend around the suit, with a 100-fold reduction in radar signature (-6 to sense it using radar or imaging radar). This is cumulative with any other radar-signature reduction. The field can be turned on or off; it takes one second to form or destabilize. This is useful, since the field negates any infrared cloaking the vehicle may have, making it most useful when the likely threat is radar detection rather than passive sensors. Plasma stealth can't be used in conjunction with optical chameleon or invisibility systems, and has a faint corona, giving a +1 to any roll to detect the user at night. (It's not bright enough to make any difference during daylight). It is $2,000, 10 lbs., LC3; adjust weight and cost by SM (see ***GURPS High-Tech*** p. 10).

The first- and second-generation plasma generators have been tested on the ground and in flight. The Keldysh research center is working on a third-generation system based on new physical principles, a possible reference to the use of electro-static energy around an airframe to reduce RCS, similar to smart kinds used in U.S. programs.

– K.A. Jacob and V.S. Manjunath, "Plasma Applications in Aeronautics," ***Scope and Challenge in Plasma***

PBM-90 "Zveroboy"

"Yes, we will use the latest technical devices. Already now they are being stationed, for example, in the southern parts of our country."

– President Vladmir Putin, questioned if Russia planned to use "gigantic, humanoid war robots" to defend itself (2006)

The *Perspektivnyy Bronirovannyi Mashina-90* ("Advanced Armored Machine" is a Russian bipedal combat robot developed as a possible successor to the T-80U and T-90 main battle tank. Nicknamed Zveroboy (or "Beast Killer"), this giant humanoid war robot was designed as a collaborative project between tank manufacturer Uralvagonzavod and aerospace company NPO Lavochkin in 2004.

It is a hulking 30'-tall bipedal machine with two claw-like arms, a head turret, and large legs. Several advanced hydrogen-fuelled air-breathing plasma-thruster units mounted on the backpack and around its body provide up to 30 minutes of flight capability before the onboard hydrogen reserve is exhausted. It is manufactured from titanium with an outer layer of advanced composite armor that incorporates red-mercury-based superconducting ceramics into its structure.

The Zveroboy is operated by a single pilot, but a passenger could squeeze in behind him (mostly because some intended defensive systems have not been added). Its key feature was the use of superconducting materials made from red mercury embedded into the very armor structure itself. This allows its own armor to serve as an ultra-high-density superconductor-loop energy bank with three orders of magnitude more energy than the best TL8 advanced batteries (approximately equivalent to an array of TL9 "F" cells). They are kept charged by an experimental MHD-gas turbine generator. Stabilization is provided by a computerized "walk by wire" system linked to a virtual-reality helmet, which is also used for weapons targeting.

Due to limitations in the supply of the core red mercury substance after the Kola borehole was exhausted, only six prototypes have been built. They are operated by a Spetsnaz GRU unit code-named "Red Bogatyr." Other special equipment includes a Keldysh-Koroteyev plasma generator that creates a plasma-stealth field that renders it invisible to radar. Unfortunately this causes the mecha to glow in the dark when it is in use, but it is effective in daylight operations, or in bad weather, smoke, etc. and against beyond-visual-range radar detection.

The giant robot has two aircraft-style pylons that retract out of its torso. They contain hardpoints with space for up to 200 lbs. of weapons each (typically missiles). A pair of 7.62mm machine guns are mounted in the turret (with 4,000 rounds). The main armament is a hand-held "mecha rifle" that it carries as a shoulder arm: the D-98TMP. This is an advanced alloy short-barreled reduced-recoil magazine-fed semi-automatic rifle version of the DT-81 125mm tank gun: Damage 6d×7(10) cr ex with linked 6d×4 cr ex, Acc 5+3, Range 3,000/9,000, Wt. 3,000/440, RoF 1, Shots 5(3), ST 100, Bulk -10, Rcl 10, $200,000. Usually two red-mercury HEAT projectiles are issued with 10× damage. Plans exist to replace this with a particle beam weapon still under development.

Aside from the plasma-stealth system, it was designed to be fitted with a variety of special defensive systems, including next-generation Relikt explosive-reactive armor, the Shtora infrared guided missile jamming system, and an EMT-7 electromagnetic pulse anti-mine jamming system. However, systems-integration problems and cutbacks have meant that none of that gear has yet been installed. It does have thermal imaging and sighting (+3 Acc, 16× magnification), radio (250-mile range), fire-suppression system, white light/infrared searchlight, a laser- and radar-warning system, and four-shot smoke discharger (***GURPS High-Tech,*** p. 229). Driving/TL8 (Mecha) is used to operate it.

Despite these glitches, the mecha stand ready to defend the Russian Federation from all manner of threats (if no one steals them and sells them to the highest bidder first). In the mean time, they are mostly being used, quietly, in various internal and counter-terrorist operations.

Vehicle Table

TL	*Vehicle*	*ST/HP*	*Hnd/SR*	*HT*	*Move*	*LWt.*	*Load*	*SM*	*Occ.*	*DR*	*Range*	*Cost*	*Locations*
8^	PBM-90	166	+2/2	11	10/15*	36	0.3	+4	1+1	200†	200	$124M	2A2Lt2Xr

* It can fly for up to 30 minutes using Piloting (Vertol)/TL8 at Move 10/120 with stall 0.

† DR 600 in frontal arc over the body and head, but only DR 200 elsewhere. Thanks to exotic superconducting armor, DR is tripled against shaped charge warheads such as HEAT, particle beam weapons and plasma weapons for as long as the power is operating (it is doubled vs. shaped charge warheads under normal conditions).

Because of its adopted role as an impromptu heavy tank destroyer, capable of knocking out the heaviest German armoured vehicles – Tiger and Panther tanks, and Elefant tank destroyers – it was nicknamed Zveroboy, "beast killer."

– "SU-152," ***Wikipedia***

About the Columnist

David L. Pulver is a Canadian freelance author. An avid SF fan, he began roleplaying in junior high with the newly released ***Basic Dungeons & Dragons.*** Upon graduating from university, he decided to become a game designer. Since then, David has written over 70 roleplaying game books, and he has worked as a staff writer, editor, and line developer for Steve Jackson Games and Guardians of Order. He is best known for creating ***Transhuman Space,*** co-authoring the ***Big Eyes, Small Mouth*** anime RPG, and writing countless ***GURPS*** books, including the ***GURPS Basic Set,*** *Fourth Edition,* ***GURPS Ultra-Tech,*** and the ***GURPS Spaceships*** series.

Metatronic Generators

by Christopher R. Rice

Superheroes, gadgeteers, evil geniuses bent on world domination, and scientific lab rats often have access to weird technology, superscience devices that seemingly defy the laws of known physics!

These optional rules use and adapt the *Psychotronic Generator* rules from ***GURPS Psi-Tech*** (pp. 13-14). They also make use of several assumptions from ***GURPS Supers.*** Those designing metatronic generators that resemble weapons will gain great mileage out of ***GURPS Power-Ups 4: Enhancements***, especially the section on *Attack Enhancements* (pp. 18-21).

The majority of superscience technological devices appearing in the superhero genre are metatronic generators – devices that emulate unusual abilities! Whether they emulate a specific hero's abilities or one all their own they are the most common devices seen (followed by, of course, the "ray-gun" or "power weapon") Metatronic generators essentially work as if the user had the power himself with the following exceptions.

- Nonattack rolls that the power would require the user to make for the ability instead rely on a new skill: Electronics Operation (Metatronics); see p. 23 for more details on this new skill. (Offensive actions require an appropriate weapon skill.) While this allows someone to more easily access the abilities the generator emulates, it does have its downsides. First, each generator is considered a separate, unique familiarity (p. B169), and the GM should enforce these penalties rigorously (requiring eight hours of use to become familiar). Users with abilities that match those of the generator *and* who have an appropriate Power Talent for it (that is, the device's emulated ability is on the list of abilities the user could purchase with the Power Talent's modifier) may add his Talent to these rolls.
- Critical failures when using a metatronic generator are *bad*. First, make a roll against the generator's HT (usually 10). Success means the person can continue to use the generator, albeit at a -2 (cumulative) penalty. Failure indicates that the device suffers a breakdown requiring a minor repair (p. B484) using Electronics Repair (Metatronics) (p. 23). Critical success means the person can continue using the device with no penalty. Critical failure results in the device doing something unexpected *and* breaking down requiring a *major* repair (p. B484). To determine the unexpected side effect, roll on the *Random Side Effect Table* (p. B479) and immediately apply its effects to the user.
- Metatronic generators *can* make use of extra effort for powers (***GURPS Powers,*** p. 160), but most users find it difficult to do so. Make an IQ-based Electronics Operation roll instead of the usual Will-based one but at *double* the normal penalty (in other words, -2 per 5% increase in capability). Failure while using extra effort causes a breakdown requiring a minor repair, while critical failure results in a breakdown necessitating a major repair (as above).
- Metatronic generators are not cumulative with any abilities the user may have. Similarly, they cannot be used when *Combining Powers* (***Powers,*** p. 170).
- Metatronic generators do not have standard power modifiers. Instead, they have the Superscience (-10%) power modifier (see ***Supers,*** p. 34). While the GM is the final arbiter of what abilities can be emulated in his game world, he should limit them to the following classifications: Biological (biogadgets, exotic drug-injectors, etc.), Magical ("magi-tech"), Mutant (tapping into strange energies, temporary DNA alteration, etc.), and Super (anything else!). Use ***Psi-Tech*** for powers with the Psionic modifier. The GM is free to change any of this if it suits his campaign better; for instance, in a game featuring metatronic generators that rely on magical principles, he should change Superscience to the Magical power modifier (see ***Powers,*** p. 27).

I Brought a Sword to a Gunfight

The rules for melee-weapon metatronic generators are pretty straightforward and simple – they assume that the built-in weapon is no better than that of an ordinary weapon of its type. For weapons that do enhanced damage, have better statistics, etc., the GM might wish to add a appropriate Innate Attack with the Melee Attack (ST-Based) enhancement from ***Powers*** (pp. 102-103) or ***Power-Ups 4: Enhancements*** (pp. 20-21).

Designing and Building

Creating a metatronic generator involves a few steps. First, you must determine the ability that your device is going to emulate. This can be as complex as designing the ability from the ground up, or as simple as using a sample one, such as from ***Powers*** (see pp. 136-151). Then, decide whether the generator is an *apparatus* or *weapon*; see pp. 17-19. Next, determine its size and how it is powered; see pp. 19. Dollar cost increases with the point cost of the ability emulated.

Compact designs cost more per point to build, so evil geniuses on a budget tend to use larger ones that occupy whole rooms in their fortresses. For generators that can only be used *once*, divide the final dollar cost by 5. Some worked examples are on pp. 20-22.

Apparatuses

Apparatuses tend to resemble either innocuous devices (such as watches or clothing) or fairly obvious ones (like a giant satellite dish for weather-controlling machines). Simply add the "Apparatus, +0%" modifier to the emulated trait.

Weapons

Metatronic generators that will be used as weapons require additional tinkering. First, determine what sort of ability you are turning into weapon using the following list.

- If the ability works like a ranged malediction (e.g., Mind Control and Mind Reading), add Weaponized (p. 18).
- If the ability works like a contact malediction (e.g., Mind Probe, Neutralize, and Possession), add both Ranged *and* Weaponized.
- Anything else can be used "as is" without the need for additional modifiers.

Second, decide what specific sort of offensive gear it is, such as a beam weapon or a staff, and add one of the following meta-enhancement packages. For ranged weapons, you may have to use Increased Range or Reduced Range to achieve the right distance.

Beam Weapon

+40%

A ray-gun, laser, etc., with 1/2D 10, Max 100, Acc 3, RoF 3, Shots 12(3), and Recoil 1. To adjust the RoF, use the *Missile RoF Table* (below).

Conventional Firearm

+25%

A pistol, shotgun, etc., with 1/2D 10, Max 100, Acc 3, RoF 3, Shots 6(3), and Recoil 2. If each shot must be loaded individually, adjust the cost by -5% and add an "i" to reload time (e.g., "Shots 6(3i)"). To adjust the RoF (including turning this into a multiple-projectile weapon like a shotgun), use the *Missile RoF Table* (below).

Missile RoF Table

RoF	*Shots (Beam Weapon)*	*Shots (Firearm)*	*Additional Cost*
1	4(3)	2(3)	-50%
2	8(3)	4(3)	-10%
3	12(3)	6(3)	-0%
4-7	RoF×4(3)	RoF×2(3)	+20%
8-15	RoF×4(3)	RoF×2(3)	+50%
16-30	RoF×4(3)	RoF×2(3)	+100%
1×9	–	2(3)	+50%
2×9	–	4(3)	+100%
3×9	–	6(3)	+100%

For weapons with a RoF of 5 or higher, you may optionally make it "Selective Fire," allowing it to fire as if it had RoF 1; this adds +10% to cost.

The GM may also permit "Very Rapid Fire" (VRF), which follows the normal rules for rapid fire (p. B373), but means you get *two* extra hits per point by which you make your attack roll. Rcl is thus *effectively* 0.5, but write it as Rcl 1 with a note. You can't use VRF to attack multiple targets or an area with spraying fire or suppression fire, however; you may only ever attack one target. This adds +10% for beam weapons or +20% for conventional firearms. For an additional +10%, you can *switch* between VRF and normal use; if you also have the Selective Fire option, you may choose between RoF 1-3, normal use, and VRF.

Unless we use The Wireless Wizard's dead zone gear and use the cell phone towers all across the world to carry your signal. His stuff would use the cell towers and people's own mobile phones as weapons.

– Jim Bernheimer,
Confessions of a D-List Supervillain

Grenade

+25% or +50%

A claymore, smoke-bomb, etc. Grenade metatronic generators assume at least an Area Effect of two yards and a fuse of two seconds. Launched grenades (+25%) have 1/2D 10, Max 100, Acc 3, RoF 3, Shots 12(3), and Recoil 1. Hand grenades (+50%) can be thrown ST×3.5 yards.

For a larger radius, add +50% to the cost per doubling (four yards is +50%, eight yards is +100%, and so on). The default assumption is that this generator is not destroyed after it is armed, and can be retrieved and have the power supply replaced. For a variable delay that you can set before you use it and is no more than 10 seconds, add +10%; longer delays add +20%; a triggered delay via remote detonator or some other triggering device adds +50%.

Melee Weapon

-25%

A sword, staff, etc. If it can actually *function* as a weapon in addition to being a generator, use the heaviest weight and the highest cost of the two. Then, take 80% of the weight and cost of the other, and add it to the final weight and cost of the generator. If it can only be used as a weapon *or* a generator at any given time, add 50% of the weight and cost instead. To build generators that can inflict more damage than an ordinary weapon of its kind, see *I Brought a Sword to a Gunfight* (p. 16). These costs assume that the metatronic generator itself has a Reach of 1, regardless of what shape it is. To modify the Reach, see the *Melee Reach Table* (below).

Melee Weapon, Throwable

-0%

As for *Melee Weapon* (above), but the weapon can be thrown as well. Its base statistics are 1/2D ST×0.1, Max ST×1, Acc 3, RoF 1, and Shots T(1).

Melee Reach Table

Reach	*Additional Cost*
C	-5%
1 or 2	-0%
C,1 *or* 1,2 *or* 2,3	+5%
1-4 (like a whip)	+10%

If the weapon cannot parry, add an additional -5%. (*Exception:* Don't add this for throwable melee weapons with Reach C.)

Muscle-Powered Ranged Weapon

Variable

A shuriken, crossbow, etc., that is not designed to be used in melee. First, decide whether it is a thrown weapon (like a shuriken) or one that uses ammunition (like a bow). For thrown weapons, this costs -35%; for ammunition-using weapons, this is -30%. If it can also be used as an ordinary weapon of its kind, use the rules under *Melee Weapons* (above) to figure out weight and cost.

New Modifiers

The Weaponized limitation first appeared in ***Psionic Powers.*** Since this article makes heavy use of it, it has been reprinted here.

Limited Use, Thrown

-5% or -25%

This limitation is a subset of Limited Use (p. B112); like Fast or Slow Reload, you can replenish your ability's uses. Unlike those two modifiers, your attack must be "thrown"; that is, once you access it, you must retrieve your weapon to use it again. -5% if the weapon is also used with the Regulatable Limitation, Melee Attack enhancement; -25% otherwise.

Muscle-Powered Range

-10%

Your attack relies on your personal ST rather than a arbitrary range. Treat it as a muscle-powered ranged weapon with a Range Statistic of ×0.1/×1. Your attack must be able to be used at range in order to have this enhancement; if combined with the regular Ranged enhancement simply write it as Ranged, Muscle-Powered and combine the costs. To actually add your ST to your attacks damage, take ST-Based as well.

Regulatable Limitation

Variable

Some limitations that are useful to have on a trait are not useful all the time, such the ability to make a normally lethal attack nonlethal by adding the No Wounding limitation. You may switch select limitations on or off as a free action at the beginning of your turn; if it takes a Ready maneuver to switch, add -5% to the final value of this enhancement.

To get the cost of this enhancement, add +40% plus the value of the limitation. For example, if you have Regulatable Limitation (No Blunt Trauma), the cost is +20%. The minimum cost for this enhancement is +5%. The GM is allowed to forbid any limitations that he deems abusive. This is essentially a more generalized version of Melee-Capable from ***Power-Ups 4*** (p. 19).

Weaponized

Variable

This limitation can only be applied to an ability that normally works like a ranged Malediction. In other words, it must use a Quick Contest instead of an attack roll, and it must be unaffected by DR. Suitable advantages include Mind Control and Mind Reading. Mind Probe, Neutralize, and Possession with the Ranged enhancement would be valid as well.

This limitation turns the advantage into a normal, visible, ranged attack. The GM must decide which attack skill it will use – typically, a specialty of Innate Attack. The attack uses size and speed/range modifiers (p. B550) and can be dodged. If it hits, the target resists by making an unopposed roll against the appropriate attribute (e.g., Will for Neutralize). If the resistance roll fails, determine the effects as normal, using the subject's margin of failure instead of the user's margin of victory.

Weaponized is worth a base -50% if the subject's DR has no effect, or -80% if his DR adds to his resistance roll, as for an Affliction (p. B35). If the subject has a fixed penalty to his resistance roll, this reduces the limitation by +10% for every -1, to a maximum of -5. For example, a Neutralize ray that ignored DR and gave the subject a Will-3 roll to resist would be a net -20% limitation.

Thrown weapons have the following base statistics: 1/2D ST×0.1, Max ST×1, Acc 3, RoF 1, and Shots T(1). Ammunition-using weapons have the following base statistics: 1/2D ST×0.1, Max ST×1, Acc 3, RoF 1, and Shots 1(2).

Using the Metatronic Generator

To use your metatronic-generator *apparatus,* activate the abilities as dictated by the combination of advantages and modifiers. However, as described on p. 16, roll Electronics Operation (Metatronics) instead of the usual required skill.

To use your metatronic-generator *weapon,* you must first hit your target, using an appropriate skill; if ranged, then your attack uses size and speed/range modifiers (p. B550) and can be dodged. For weapons without the Weaponized limitation this is fairly straightforward – you resolve the attack like any other innate attack or affliction. For those *with* the Weaponized limitation, if the attack hits, the target resists by making an unopposed roll against the appropriate attribute; for instance a "neutralization ray" might require a Will roll. If the resistance roll fails, determine the effects as normal, using the subject's margin of failure instead of the user's margin of victory. The generator's specific version of the Weaponized limitation also dictates whether the subject's DR has any effect on the abilities, and whether the generator's abilities are more difficult to resist than normal; see *Weaponized* on p. 18 for more details.

Powering a Metatronic Generator

Metatronic generators are normally externally powered by electricity. Self-powered metatronic generator weapons cost *twice* as much and replace one shot per second of nonuse. Either way, abilities that cost FP to use *still* cost FP, in addition to any additional power the generator requires. The FP must come from the user, but if he has an Energy Reserve for abilities that match what the generator is trying to emulate (typically Super), he can use that as well. If the GM allows, metatronic generators may optionally have a "capacitor"; buy this as an Energy Reserve and add it to the device's final point cost. If a metatronic generator can *only* draw any FP costs from this Energy Reserve, add "Accessibility, FP costs must use built-in ER, -5%" to all abilities it emulates.

Power Table

For one-time use generators, divide dollar cost by 5. To determine cost at TLs other than TL8, divide cost by $20,000 (the suggested average starting wealth of a TL8 setting), then multiply that number by the starting wealth for the campaign's TL (p. B27). For example, a mini metatronic generator in a TL4+1 clockpunk campaign would cost $750 × point cost.

Size	*Dollar Cost*	*Weight*	*Power Requirement**	*LC†*	*Bulk‡*	*ST‡*
Tiny (SM -8)§	$3,500 × point cost	0.03 lbs.	2×AA/1 day	3	-1	1
Mini (SM -6)	$3,000 × point cost	0.3 lb.	T/6 hrs. or 2×A/1 day	4	-3	2
Small (SM -4)	$2,500 × point cost	3 lbs.	XS/6 hrs. or 2×B/1 day	4	-5	4
Portable (SM -2)	$2,000 × point cost	30 lbs.	3×S/6 hrs. or 2×C/1 day	4	-7	9
Semi-Portable (SM 0)	$1,500 × point cost	300 lbs.	L/6 hrs., 2×D/1 day, or external power	3	-9	18
Large (SM +2)	$1,000 × point cost	3,000 lbs.	VL/6 hrs., E/1 day, or external power	3	N/A	N/A

* For generators that are beam or conventional weapons, the power requirement indicated becomes the number of cells required for its listed amount of shots.

† This should be adjusted by the GM if he feels it should be lower, use the campaign guidelines to determine what Legality Class (LC) a given device should be. Weapons are almost *always* LC3 or less.

‡ This is for metatronic generators that are weapons, though the GM can use this statistic for all devices when using skills such as Holdout or Camouflage. The GM can also adjust this by ±1 to match a given device to its more mundane counterpart. For generators that emulate mundane weapons, use *that* Bulk and ST statistic – instead of this one – if worse.

§ Tiny generators *require* either TL9 or higher technology or that they be self-powered. Tiny generators are not usually weapons; the only exceptions are small one-use items such as grenades.

Cliff nodded. "You saw that bit about the new Chinese disintegrator? If the Government had seriously considered our Crumbler –"

– Victor Rousseau, "The Wall of Death"

Metatronic Generator Examples

The following are examples of metatronic generators using these rules.

Anti-Mutant-Detection Device

A tiny device the size of a ring, usually built into another item, it completely masks the fact that the user is a mutant or psi. It's self-powered and runs off of piezoelectricity produced by the wearer. Tiny, $294,000, 0.03 lbs. Self-Powered. LC2.

Statistics: Obscure 10 (Detect (Superhumans); Apparatus, +0%; Defensive, +50%; Extended Sense, Detect (Psi), +20%; No Area Effect, -50%; Stealthy, +100%; Superscience, -10%) [42].

Cloud Seeder

Large enough to fill the back of a semi-truck and looking like a cross between a satellite dish and the guts of a microwave, this metatronic generator allows the user to control the weather within a three-mile radius. It can produce effects that give ±10 to rolls that would be helped or hindered by the weather. You decide from what type of weather the penalty or bonus is coming, such as snow, a lightning storm, wind, hail, fog, and so on.

Example: Dr. Khaotic is using his cloud seeder to threaten the city of New York unless his demands are met. Not wanting to unleash the full power of his device right away, he decides to create a torrential downpour, flooding streets and making it difficult for people to navigate. This gives a -5 to all Vision and Driving rolls, but could also give a +5 bonus on all rolls relating to fighting a fire. Alternatively, he could produce hail that did 1d+4(0.2) cr damage to everything in the area.

Due to the complexities of this particular metatronic generator, all Electronics Operation (Metatronic) skill rolls are at -3, and any roll of 16 or higher is considered a failure. It requires at least one hour to initiate; all effects last 50 minutes after the cloud seeder is used. However, if it remains in constant use, the effects continue until it's turned off! Optionally, you may use this metatronic generator at range; when determining range penalties, consult the *Long-Distance Modifiers* box on p. B241. Large, $2,010,000, 3,000 lbs. External Power. LC2.

Statistics: Control Weather 30 (Apparatus, +0%; Extended Duration, ×300, +100%; Hard to Use 1, -5%; Immediate Preparation Required, 1 hour, -75%; Long-Range 1, +50%; Natural Phenomena, +100%; Persistent, +40%; Ranged, +40%; Unreliable, Malf. 16, -5%; Superscience, -10%) [2,010].

Dumb-Dumb Grenade

A small spherical device that activates when turned counter clockwise. After two seconds, everything within a four-yard radius of the grenade must make a Will-2 roll. Failure results in all targets becoming drooling idiots who can neither speak nor focus on any particular task for a number of minutes equal to their margin of failure (minimum of one minute). This is a one-use device. Mini, $88,200, 0.3 lbs. T or 2×A. LC2.

When Standing Waist Deep in Gasoline, Avoid Matches

These rules assume that the GM allows anyone with money to purchase a metatronic generator; for some campaigns, this will simply not work. The GM should *rigorously* enforce the *Gadgets for Non-Gadgeteers* rules on p. B477. The GM should also review *Unusual Background and Equipment* in ***Supers*** (p. 75). Finally, things might get out of hand if Gadgeteer adventurers emulate powers and abilities that other characters paid points for by buying them as equipment. The GM could charge inventors a one-time character point cost equal to the 1/5 the cost of starting with the invention: 1 point if the gadget is Simple, 3 points if Average, 6 points if Complex, or 10 points if Amazing. If the metatronic generator uses *really* alien principles or superscience unknown in the setting, the GM may charge an additional 5 points on top of the above. The trade-off is that, while the inventor does acquire new "powers" with each invention, he has less to spend on his own personal traits, and his "powers" are still as breakable and subject to malfunction as normal equipment!

The GM could forbid the Quick Gadgeteer advantage, allowing only the regular Gadgeteer advantage. Optionally, he could permit a special, 30-point version of Gadgeteer that acts as standard Gadgeteer *unless* the inventor spends a single character point, in which case it's upgraded to Quick Gadgeteer for the purpose of *one* invention.

Alternatively, the campaign may have a "hard limit" on the number of metatronic generators someone has. For such settings, an inventor may have a number of metatronic generators equal to 3 + *half* his Engineer (Metatronics) skill (round down). Add 5 for having the standard Gadgeteer advantage, or 10 with the Quick Gadgeteer advantage. Simple gadgets count as one, Average as three, Complex as six, and Amazing as 10. If the number of generators exceeds this limit, the oldest one acquires Unreliable, 5 or less, on its abilities due to reduced maintenance or usage. Those with the Inventor! wildcard skill (***Supers,*** p. 37) may substitute that skill instead of Engineer (Metatronics) to determine their cap. If using the rules for *Hyper-Competency* (***GURPS Monster Hunters 1: Champions,*** pp. 28-29) or *Wildcard Points* (*Paying Fate's Price,* ***GURPS Power-Ups 5: Impulse Buys,*** p. 5), one wildcard point allows the inventor to ignore the Unreliable limitation on a given device for *one* use only.

You don't become a world-class villain overnight.
– Austin Grossman, ***Soon I Will Be Invincible***

Metatronic Generator Table

All metatronic generators are superscience (TL^); see pp. B513-514. Being a specialized field of electronics, they could begin to appear at TL7, possibly even as early as TL5.

Melee Weapons

Weapon	*Damage*	*Reach*	*Parry*	*Cost*	*Weight*	*ST*
BRAWLING, KARATE, or DX						
Ricocheting Discus	thr+1d cr	C	0	$75,000	3	–
STAFF (DX-5, Polearm-4, or Spear-2)						
Mind-Control Staff	sw+2 cr	1, 2	+2	$112,500	5	7†
or	thr+2 cr	1, 2	+2	–	–	7†
TWO-HANDED SWORD (DX-5, Broadsword-4, or Force Sword-4)						
Mind-Control Staff	sw+2 cr	1, 2	0	$112,500	5	9†
or	thr+1 cr	2	0	–	–	9†

Missile Weapons

Weapon	*Damage*	*Acc*	*Range*	*Weight*	*RoF*	*Shots*	*ST*	*Bulk*	*Rcl*	*Cost*	*Notes*
BEAM WEAPONS (PISTOL) (DX-4 or other Beam Weapons at -4)											
Freeze-Ray	1d fat	6	50/200	3	3	12(3)	4	-3	1	$100,000	[1]
GUNS (PISTOL) (DX-4 or other Guns at -2)											
Repelling Revolver	3d	5	10/20	3	3	6(3i)	11	-3	2	$70,000	
or	3d nbt nw	–	–	–	–	–	–	–	–	–	[2]
or	3d dbk nbt nw	–	–	–	–	–	–	–	–	–	[3]
or	3d dbk dbt nw	–	–	–	–	–	–	–	–	–	[4]

Notes

[1] Targets who take FP damage must make a HT at s of damage rolled, failure means he is frozen solid (i.e. paralyzed) for 20-HT (minimum of 1) minutes.

[2] Roll damage normally, but this attack inflicts no actual damage, only knockback.

[3] Roll damage normally, but this attack inflicts no actual damage, but knockback damage is doubled.

[4] Roll damage normally, but this attack inflicts no actual damage, just blunt trauma and knockback, both of which are doubled.

Thrown Weapons

Weapon	*Damage*	*Acc*	*Range*	*Weight*	*RoF*	*Shots*	*Cost*	*ST*	*Bulk*	*Notes*
THROWN WEAPON (DISC) (DX-4 or Throwing-2)										
Ricocheting Discus	thr+1d cr	4	×5/×10	3	T(1)	1	$75,000	6	-3	[1]

Note

[1] Returns to the wielder's hand at the end of his turn.

Statistics: Affliction 3 (Will-2; Attribute Penalty, -20 IQ, +200%; Based on Will, +20%; Disadvantages, Cannot Speak, Gullibility (6), Hidebound, Short Attention Span (6), +60%; Grenade, Hand Grenade, 4-yards, +100%; No Signature, +20%; Superscience, -10%) [147].

Force-Field Generator

The size of a cell phone, this device covers the user in a powerful resilient defensive barrier that gives him DR 15 with the Force Field enhancement and one level of Hardened. Due to rapid power consumption, the field can only be used twice (with each use lasting one minute) before its batteries (or power cells) need to be replaced. Mini, $225,000, 3 lbs. T/1 one-minute use or 2×A/1 one-minute use. LC3.

Statistics: Damage Resistance 15 (Apparatus, +0%; Force Field, +20%; Hardened 1, +20%; Limited Use, 2/day, -30%; Superscience, -10%) [75].

It's a psycho-frakulator! It creates a-a cloud of radically fluctuating deviant chaotrons, which penetrate the synaptic relays. It's concatenated with a synchronous transport switch that creates a virtual tributary! It's focused onto a biobolic reflector and what happens is, is that hallucinations become reality . . . and the brain is literally fried from within.

– Doctor Heller, in ***Mystery Men***

Freeze Ray

A large, somewhat bulky pistol that can cause a target hit with its beam to be frozen solid. Small, $100,000, 3 lbs. XS/12 shots or 2×B/12 shots. LC3.

Statistics: Fatigue Attack 1d (Accurate +3, +15%; Based on HT, +20%; Beam Weapon, +40%; Freezing, +20%; Increased 1/2D, ×5, +10%; Increased Max, ×2, +5%; Side Effect, Paralysis, +200%; Superscience, -10%) [40].

Mind-Control Staff

This stylish staff can make others bend to your will. You must first touch them with it; then they must make a Will-5 roll. Failure means you can give your target orders for as long as you concentrate, and then for minutes equal to his margin of failure afterward. Any command that goes against the subject's values or sense of self-preservation triggers another resistance roll, possibly at a bonus.

The subject remembers everything he did, but he is convinced that he *chose* to do so. He will react to behavior too bizarre to be rationalized by pushing it out of his mind and not thinking about.

This can also be used as a regular quarterstaff when powered down. Small, $112,500, 5 lbs. XS/6 hrs. or 2×B/1 day. LC2.

Statistics: Mind Control (Melee Weapon, Reach 1, 2, -20%; Rationalization, +20%; Superscience, -10%; Weaponized, Ignores DR, -5 to resist, -0%) [45].

Ricocheting Discus

This ordinary-looking discus (***Martial Arts***, pp. 215 and 231) can be thrown at a target. The weapon returns to you at the end of your turn, though you must have at least one hand free to "catch" the discus. It may also be used in melee combat by gripping the edge of the ring and "punching" with it (counting as an improvised fist-load). Finally, when using the ricochet rules from ***Powers,*** pp. 166-167), this weapon doesn't lose damage after each bounce. Small, $75,000, 3 lbs. Self-Powered. LC3.

Statistics: Crushing Attack 1d (Accurate 1, +5%; Double Blunt Trauma, +20%; Double Knockback, +20%; Increased 1/2D, ×50, +25%; Increased Max, ×10, +15%; Melee Weapon, Throwable, Reach C, -5%; Returns to throwers hand at end of turn, +5%; Ricochet, +10%; ST-Based, +100%; Superscience, -10%) [15].

Repelling Revolver

Looking like a bulky revolver, this weapon is perfect for crowd control, as it can switch between lethal and nonlethal modes. It uses both regular bullets (.44M rounds; each bullet weighs 0.054 lbs. and costs $0.50) and a battery to power it. It has four modes: regular damage, no damage with no blunt trauma (roll damage to determine the amount of knockback only), no damage with no blunt trauma *and* double knockback (roll damage to determine the amount of knockback only, then double it), *or* no damage with double blunt trauma *and* double knockback (roll damage to see if there is any blunt trauma or knockback then double it). Note that other combinations of enhancements are possible, but to keep it simple, this metatronic generator should be used "as is." Small, $70,000, 3 lbs. XS/6 shots or 2×B/6 shots. LC3.

Statistics: Crushing Attack 3d (Accurate +2, +10%; Conventional Firearm, Slow Reload, +20%; Double Blunt Trauma, +20%; Double Knockback, +20%; Reduced Max, ×5, -10%; Regulatable Limitation, No Blunt Trauma, +20%; Regulatable Limitation, No Wounding, +5%; Selectivity, +10%; Superscience, -10%) [28].

Under the Hood: Metatronic Generators

Metatronic generators make a lot of assumptions to make the math easy for the GM. For those who want to dig in the guts of the system, use the following information.

Beam Weapon (+40%): Limited Use, 4 uses (12 shots), Fast Reload, -10%; Rapid Fire, RoF 3, +50%.

Conventional Firearm (+25%): Extra Recoil 1, -10%; Limited Use, 2 uses (6 shots), Fast Reload, -15%; Rapid Fire, RoF 3, +50%. Weapons that require 3+ seconds to reload *each* shot replace Fast Reload with Slow Reload, for another -5%.

Grenade (+25% or +50%): Area Effect, 2 yards, +50%; Delay, Fixed, 2 seconds, +0%; Limited Use, 1 use (1 shot), Slow Reload, -25%. Hand grenades add Increased 1/2D, ×10, +15%; Increased Range, ×3.5, +20%; Muscle-Powered Range, -10%.

Melee Weapon (-25%): Melee Attack, Reach 1, -25%.

Melee Weapon, Throwable (+0%): Limited Use, Thrown, -5%; Muscle-Powered Range, -10%; Regulatable Limitation, Melee Attack, Reach 1, +15%.

Muscle-Powered Ranged Weapon (-35% or -30%): Thrown weapons have Limited Use, Thrown, -25%; Muscle-Powered Range, -10%, for a net -35%. Ranged weapons that rely on ammunition have Limited Use, 1 use (1 shot), Fast Reload, -20%; Muscle-Powered Range, -10%; for a net -30%.

The GM should forbid players from adding more than 5 levels of the Reliable enhancement to any given ability for metatronic generators. Since Electronics Operation (Metatronic) has a default of IQ-5, this would allow even someone who has never used such a Reliable device before to roll at IQ to activate it (though he does still suffer familiarity penalties).

New Skill Specialties

The following are new specialties of skills that appear in the ***Basic Set.***

Electronics Operation, Electronics Repair†

see pp. B189, 190

Metatronic devices require a new specialty of Electronics Operation to use and repair.

Metatronics: Any "weird technology" – typically, devices that emulate super abilities like neutralizer rays or weather-controlling machines. Both skills may also default to Weird Science-3.

Engineer†

see p. B190

Designing and building metatronic devices requires a new specialty of the Engineer skill.

Metatronics: Designing "weird technology" – generally, devices that emulate super abilities like neutralizer rays or weather-controlling machines. It can default to Electronics Operation (Metatronics)-6 or Weird Science-3; however, there is *no* default for individuals from backgrounds where superhuman abilities do not exist. In settings where multiple power sources can be emulated with metatronic generators, this skill might default to other appropriate skills, for instance, "magi-tech" devices might default to Thaumatology-4.

Weird Science

see p. B228

This skill gains new uses for campaigns that use metatronic devices. In addition to its other applications as listed under the skill description, it may also be used to analyze a given device; this takes at least one hour of scrutiny and requires a skill roll. Success indicates that you know what the device does. Failure means you have a idea; you can reroll at a -2 penalty to discern its properties. Critical success means you understand the device well enough that you can use it *without* suffering familiarity penalties. On a critical failure, the GM lies about the devices function, with ensuing consequences. (For instance, Dr. Khaotic critically fails on his roll to discern what a captured metatronic generator does; thinking it's a portable antigravity device, he finds – much to his dismay – that it is, in fact, a floral growth enhancer . . .) Be inventive!

Dr. Eric Foreman: I'm not telling a mother who's scared out of her mind that our best shot is a magic trick.

Dr. Gregory House: It's not magical. It's experimental.

*– **House, M.D.** #6.16*

About the Author

Christopher R. Rice is definitely both an evil genius and superhuman. Unfortunately, his super ability is "super-napping," enabling him to put any child to sleep instantly by merely rocking back and forth, and his fiendish plans typically involve coffee. From Portsmouth, Virginia, he lurks in his secret underground bunker, building doomsday devices. He dreams of being able to write full time one day, or at least eking out a living doing it. He thanks L.A., his own personal muse, as well as the rest of his gaming group, Christian Gelacio for helping him with the metatronic generators, and his good friend Antoni Ten Monrós for being a sounding board.

Fantasy-Tech 2000

by Matt Riggsby

GURPS Fantasy-Tech 1: The Edge of Reality dealt with a wide range of bad science and failed technology from the pre-industrial age. But what happens if those technologies make it into the modern era? What effect does better astronomy have on your horoscope? What would Daedalus's wings have looked like during the Second World War? This article answers questions you probably haven't asked about what happens when the edge of reality gets a little closer to the present day.

> *The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.*
>
> *– George Bernard Shaw*

Weapons

There's no need to leave implausible weapons in the past; this updated armament combines ancient approaches with modern improvements. Most of them rely on something other than gunpowder and similar chemical explosives to do damage. Their performance is typically poorer than conventional weapons, but they may be used in worlds that never invented chemical explosives, or assembled by gadgeteers with access to lots of parts but few chemicals. The combination weapons have their own drawbacks relative to pure melee and missile weapons, but they're not bad for situations where close-in combat with tough opponents is a possibility (if, say, their users are ***Monster Hunters***), or where the user wants to look as metal as possible.

Reflective Heat Rays

Archimedes' reflective heat ray was a nasty surprise for unprepared Roman ships, but suffered from limitations imposed on it by material science and a lack of automation. Later (mad) scientists can improve on the design in a number of ways.

At TL5, mass-produced mirrors and superior optics significantly improve power and accuracy while dropping the price. Developments in variable-geometry mirror arrays and even better optical systems improve performance incrementally at TL6 and TL7, though for an increased price.

At TL8, performance is the same as at TL7, but targeting computers allow batteries of mirrors to be linked together and fire in unison at the same targets. A linked array can be aimed and fired as a single unit, with one roll to-hit and one damage roll, equal to the combined damage done by each unit. For example, an array of five reflective heat rays would do 10d+10. Effective range is the *average* range of units to the target.

Like ancient improved reflective heat rays, higher-tech reflective heat rays use a complex series of reflectors that allow them to attack targets at any angle so long as the sun is out. However, they are heavily affected by lighting conditions. Subtract 1 point of damage *per die* for *each* of light fog and cloud cover, 2 points for each of moderate clouds and heavy fog, and 3 points for completely overcast skies.

Dieselpunk Steam Cannon

The dieselpunk steam cannon are better versions of the wood- and charcoal-fired steam guns of Archimedes and Leonardo da Vinci, using gasoline, kerosene, or some other liquid fuel to heat the vaporization chamber. In addition to relying on pressurized jets of burning fuel, they incorporate superior principles of gunnery (the dieselpunk cannon are rifled rather than Renaissance-era smoothbores). They use optimized alloys and more efficient insulation for faster heating (the weapons only need to heat for five minutes before firing), better internal water distribution, and other tricks to improve the weapon's performance and reduce its size.

In addition to ammunition, the dieselpunk steam guns require fuel to keep them at firing temperature. The 1 lb. gun runs through 12 lbs. of liquid fuel (about two gallons) per hour. The 10 lb. gun uses 48 lbs. (eight gallons) per hour.

If using multi-shot and other ammunition options from ***GURPS High-Tech***, the 1 lb. steam gun is about 12.5mm, while the 10 lb. gun is about 25mm.

Weapon Tables

Melee Weapons

TL	Weapon	Damage	Reach	Parry	Cost	Weight	ST	Notes
TWO-HANDED AXE/MACE (DX-5, Axe/Mace-3, Polearm-4, or Two-Handed Flail-4)								
5	Carbine Axe	sw+3 cut	1	0U	$500	10	12‡	
8	Assault Carbine Axe	sw+3 cut	1	0U	$1,300	9	12‡	
POLEARM (DX-5, Axe/Mace-3, Polearm-4, or Two-Handed Flail-4)								
5	Glaive-Guisarme-Shotgun	sw+1 cut	1	0U	$350	7	9†	
	or	thr+2 imp	1	0	–	–	9†	
	or	thr-1 cut	1	0	–	–	9†	[1]

Notes

[1] This can use the Hook technique. However, despite doing thrust damage, this may not be used in a combined "shoot-stab" maneuver (see ***Fantasy-Tech 1,*** p. 12).

Missile Weapons

TL	Weapon	Damage	Acc	Range	Weight	RoF	Shots	ST	Bulk	Rcl	Cost	LC	Notes
GUNNER (CANNON) (DX-4 or other Gunner-4)													
6	Dieselpunk Steam Cannon, 1-lb.	6d×2 pi+	2	1,000/3,000	700/1	1	1(30)	20M†	-12	1	$8,500/$5	1	
6	Dieselpunk Steam Cannon, 10-lb.	6d×4 pi++	2	1,500/4,500	8,000/10	1	1(45)	40M†	-14	1	$50,000/$40	1	
GUNNER (MACHINE GUN) (DX-4 or other Gunner-4)													
5	Centripetal Steam Gun	4d pi+	2	150/3,000	10,000/1	1	60(5)	80M†	-10	2	$30,000/$4	2	
GUNNER (MIRROR) (DX-4 or other Gunner-4)													
5	Early-Industrial Reflective Heat Ray	2d burn	4	100/140	1,500	1	Special	60M†	-16	–	$75,000	2	
6	Late-Industrial Reflective Heat Ray	2d+1 burn	7	120/150	1,600	1	Special	60M†	-16	–	$100,000	2	
7	Space-Age Reflective Heat Ray	2d+2 burn	8	130/155	1600	1	Special	60M†	-16	–	$100,000	2	
GUNS (PISTOL) (DX-4 or most other Guns at -2)													
5	Knife-Revolver	2d-1 pi	1	120/1,300	2.5/0.24	1	6(3i)	10	-2	2	$150	3	
6	Knife-Automatic	2d+2 pi	2	150/1,850	2.4/0.4	3	8+1(3)	9	-2	2	$350	3	
GUNS (RIFLE) (DX-4 or most other Guns at -2)													
5	Carbine-Axe	3d+1 pi+	3	300/2,200	10/0.6	2	15+1(2i)	12†	6	2	$500	3	
8	Assault Carbine-Axe	4d pi	4	600/2,500	9/1	12	30+1(3)	9†	-5	2	$1,300/$34	2	[1]
GUNS (SHOTGUN) (DX-4 or most other Guns at -2)													
6	Glaive-Guisarme-Shotgun	1d+1 pi	3	50/125	8/0.7	2×9	5(3i)	10†	-5	1	$350	4	

Notes

[1] Has a folding stock (***GURPS High-Tech,*** p. 160); with the stock folded, has Acc 3, ST 11†, Bulk -4, Rcl 3.

Centripetal Steam Gun

Several engineers experimented with steam-powered weapons around the Civil War. In these weapons, steam wasn't a propellant. In a sense, this generation of steam weapons was made of smoke-belching, full-auto slings. A small steam engine on a carriage powered a disk-like assembly of tubes spinning on its axis. Bullets dropped from a hopper into a tube, which led from the center of the disk out to the edge. The centripetal acceleration hurled them with great force and at a high rate of fire. That was the idea, anyway.

These guns did work, after a fashion. They hit with greater force and fired more rapidly than contemporary rifles.

However, they provided poorer performance and worse accuracy than a contemporary Gatling gun in a package the size of a wagon and at a very high cost. For these reasons, they were never deployed on the battlefield. Still, a skilled gadgeteer might be able to improve their performance somewhat.

In addition to ammunition, the centripetal steam gun consumes both water and solid fuel: 125 lbs. of wood and 25 gallons of water per hour. Bullets are poured into an open hopper at the top of the weapon, so it can be loaded without interruption in firing.

Our plans miscarry because they have no aim. When a man does not know what harbor he is making for, no wind is the right wind.

– Seneca

Combination Weapons

These weapons combine high-tech firepower with old-school blades. Because of their unusual shapes, they are limited in their ability to include accessories. The knife-pistols and the glaive-guisarme-shotgun can't mount accessories (such as tactical lights or auxiliary grenade launchers) under the barrel. The knife-pistols *can* mount accessories such as silencers on the end of the barrel, but this imposes an additional -1 penalty to Knife skill and makes it impossible to thrust. The carbine-axes can't mount accessories to the side of the barrel.

Knife-Revolver: This is a .36 revolver with a large knife blade under the barrel. It may be used as a knife at -1 to skill, and may not be thrown.

Knife-Automatic: This higher-tech version of the knife-gun combines a large knife with a 9mm automatic pistol. It may be used as a knife at -1 to skill and may not be thrown.

Carbine-Axe: A heavy-duty version of the older gun-hatchet puts an axe blade on either side of the end of a barrel of a carbine, sticking out like wings. The assault carbine-axe is a higher-tech automatic version. It may be used as an axe at -1 to skill. The extra weight at the end of the barrel gives -1 to skill when used as a carbine; bracing the weapon removes the penalty. It can mount a bayonet for appropriate additional penalties. A carbine pickaxe has identical stats and performance, except it has one blade replaced with a spike. It does sw+3 imp and may become stuck (see p. B405).

Glaive-Guisarme-Shotgun: This weapon is a pump-action shotgun with an elaborate head projecting from just under the muzzle, allowing it to be used as a short polearm. Both applications are at -1 to skill, though the shotgun penalty can be eliminated by bracing. It has a broad blade with an edge to one side, a hook on the other, and a wicked point, so it can be used to thrust, cut, or yank opponents.

TRANSPORTATION

Old impossible transportation can go faster and farther with modern technology.

Incombustible Oil Engines

For a society with internal combustion or steam engines, incombustible oil is the next best thing to perpetual motion. Vehicles containing such engines can be specially adapted to use incombustible oil, collecting and reusing a tiny quantity of fuel. The adaptation costs 1% of the vehicle's cost, and it cannot use conventional fuels. The vehicle's range becomes infinite; Lwt. remains the same, but load increases by 1-3% for most vehicles. At the prices in ***Fantasy-Tech 1,*** a "full tank" of incombustible oil is $150 per ton of Lwt.

Ornithopter

At TL6+1, Leonardo da Vinci's vision of a man-powered aircraft driven by flapping wings gets a boost from a small internal combustion engine. Better materials allow the engine to be mounted without increasing total weight. The aircraft is small (one man, and it's a tight fit at that), slow, and the range is poor compared to fixed-wing aircraft at a similar TL, but it's remarkably maneuverable. Indeed, the exceptionally low stall speed makes it capable of taking off with next to no runway and nearly hovering while in flight.

Vehicle Table

TL	Vehicle	ST/HP	Hnd/SR	HT	Move	LWt.	Load	SM	Occ.	DR	Range	Cost	Locations	Stall
DRIVING/TL (HEAVY WHEELED)														
5	Steam Cat	64	-2/3	10	1/5	3	1	+3	2+4	14	75	$15K	T4W	
TL	**Vehicle**	**ST/HP**	**Hnd/SR**	**HT**	**Move**	**LWt.**	**Load**	**SM**	**Occ.**	**DR**	**Range**	**Cost**	**Locations**	**Stall**
PILOTING/TL (ORNITHOPTER)														
6+1	Powered Ornithopter	22	+2/2	11c	2/25	0.225	0.15	+2	1	1	100	$42K	EWi	3

Personal Wings

Becoming available at TL6^, this high-tech development of Daedalus's original design for flying wings takes advantage of synthetic materials to provide the benefits of the original wax and feathers but without the drawbacks of melting and becoming easily waterlogged. When strapped to the user's arms, these wings allow the user to fly with a maximum load of BL×8, including the flier's own weight, to a maximum of 400 lbs. Airspeed is the user's Speed×2. Flapping the wings takes 1 FP every two minutes, but the user can glide for short periods (losing one yard of height per 10+TL yards of forward motion). Updrafts, located on a Meteorology roll, can be used to increase altitude, per the Flight advantage (p. B56).

The TL6^ version is still moisture sensitive; roll against the wing's HT of 12 every minute if they become moderately damp to avoid losing lift and sending the flier plummeting to the ground. At TL8^, the wings are completely water-resistant. Both can sustain any heat short of burning damage without hurting performance. $12,000, 4 lbs. at TL6^; $8,000, 3 lbs. at TL7^+.

Steam Cat

The original steam cat (***Fantasy-Tech 1,*** p. 25) is essentially a Di Giorgio tank mounting a steam cannon. At TL5, a different kind of steam cat becomes possible. This model of steam cat lacks the original's weapon, but mounts an actual steam engine, allowing much better speed and more armor, as well as providing a stronger bite and letting the crew use gun ports.

Anyone standing immediately in front of the steam cat (that is, within one yard, rather than the two-yard reach of the Di Giorgio tank) may be attacked by whirling, steam-driven blades doing 5d+2 cutting damage. Crew includes a driver and an engineer.

Other Technologies

Relying as they do on "ancient wisdom," the products of many technologies change little. However, their results become much easier to achieve.

Alchemy

An alchemist working with modern glassware, accurate temperature measurement and timers, and other modern lab equipment can produce elixirs more quickly and in larger quantities than his ancestors. At TL5 or higher, the value of raw materials drops to $50 per dose/ounce of material. An alchemist now can produce in a single batch a number of doses equal to his skill *times* the TL, and it takes half as long to process a batch. Effectiveness doesn't change; purity is still purity. However, it takes much less time and effort to get a batch of materials to that point, so elixirs end up vastly cheaper. Use these prices for alchemical elixirs for TL5 and above:

Degree	*Cost*	*Degree*	*Cost*
1	$51	6	$8,055
2	$252	7	$14,260
3	$655	8	$20,660
4	$1,255	9	$27,260
5	$2,055	10	$39,060

Astrology

At higher TLs, astrology becomes potentially more accurate and easier to do because of improved tools and more information about more astronomical bodies. Better timekeeping and navigation methods can give the astrologer an extremely precise fix on a subject's birth and therefore a more accurate horoscope. At TL5 or better, an astrologer gains +1 if he knows the subject's birth to the second. At TL8 or better, he gains an additional +1 if he knows the subject's birthplace within one yard. The bonus for exceptional observational equipment increases as appropriate for the TL (p. B345). Provided with enough data, software (see ***GURPS High-Tech,*** p. 22) can do the job of creating a horoscope as well as a human.

Astrology is the study of cycles. By observing the cyclical movements of the planets, we are able to gain a greater understanding of the cycles and patterns in our own lives . . . Astrology can be applied in many ways to many different situations. Although astrology is not fortunetelling, when skillfully applied, astrology can be an extremely effective predictive tool.

– Kevin Burk,
Astrology: Understanding the Birth Chart

Esoteric Medicine

Practitioners of esoteric medicine, like alchemists and astrologers, benefit to some extent from improved materials and implements. In this case, they may act as physicians of their TL with regard to curing patients (p. B424), though they must administer appropriate treatments as at lower TLs. The bonus provided to resistance to aging and disease becomes +(TL/4), rounded up.

. . . the history of science is the only history which displays cumulative progress of knowledge; hence the process of science is the only yardstick by which we can measure the progress of mankind.

– Laurence J. Peter

Perpetual Motion Machine

Small overbalanced wheels become modestly more efficient at higher TLs. A 5" machine gains +1 ST per TL above 4; 20' wheels gain +2 ST per TL. Costs and weights remain the same as in ***GURPS Fantasy-Tech 1*** (p. 23). The greatest improvement, though, comes in materials technology allowing the construction of much larger unbalanced wheels. All-metal wheels can attain a diameter of up to 80'. These provide ST 40 + 4 × (TL-4). An 80' wheel is $4.41M and weighs 64 tons.

New Esoteric Techniques

Here are two new uses of pseudoscience.

Comparative Horoscopes

One common use of horoscopes is to determine how well two people will interact based on the stars of their birth. This is usually done to ensure that two people will be compatible for marriage. It might also be used to see which of two opposed people has an advantaged position.

To find a day for one person to begin a venture involving another that will *not* be unlucky, make a Fortune Telling (Astrology) roll for the second party first. If that roll succeeds, it provides +2 to the Fortune Telling roll for the first party; if it fails, it provides a -2 penalty. Both rolls are at -5 to find a lucky *hour,* or -10 for a lucky minute.

Acupuncture

The patient's skin is lightly pierced with needles, which may be metal, wood, or some other hard material as the physician determines is best. On the table in ***Fantasy-Tech 1*** (p. 32), this technique may be called for instead of burning on a roll of 7. A treatment takes an hour. Unlike other treatments, it requires a DX-based Esoteric Medicine roll to determine side effects. On a failure, it does 1d-3 damage to the patient.

In addition to its use as a regular esoteric treatment, it can help reduce or prevent pain. A successful treatment (separate from a regular treatment to prevent aging or cure disease; again, DX-based) reduces Chronic Pain by one level for a day; multiple treatments are cumulative. It also reduces pain-related penalties, including shock, by 1 for a day; multiple treatments have no further effect.

Defensive Magnets

Two options for defensive magnets appear during the industrial age. At TL5, electromagnets allow the production of defensive magnets that can be turned on and off. This is convenient, but also makes them vulnerable to attacks on their power supply. These cost $200 and weigh 10 lbs. for ST 1, and must be attached to a power grid in order to operate. Late in TL7, immensely powerful rare-earth magnets are developed. Like the original defensive magnets, they cannot be turned on and off, but they provide a powerful pull in a relatively lightweight, inexpensive package: $150, 1 lb. for ST 1. In both cases, multiply cost and weight by the desired ST squared.

Sound Levitators

If sonic resonances can be used to lift heavy objects, the appearance of electronic audio technology at TL6 makes sound levitation much easier. Battery-powered speaker units generating the proper frequencies are initially heavier and more expensive than earlier musical instruments, but they *don't* require a band of trained musicians to be effective. They must be set by an operator with Electronics Operation/TL6^ (Sound Levitator). Each provides an effective ST of the operator's skill + TL; at least two must be used. Each unit is $1,000, 4 lbs. at TL6^. Halve cost and weight for each TL up to TL9^. They use Medium batteries for an hour's operation at TL6^, dropping one size per TL thereafter.

About the Author

Matt Riggsby was a later product of the atomic-bomb program, emerging in the midst of the Vietnam War. After witnessing the earthquake that sent California into the ocean and studying paleontology (briefly interrupted by the Boston Tea Party), he married two women of the same name and had at least one child. He now works for a German telegraph company. This is his 114th ***Munchkin*** card.

The Daughter of Necessity

by Roger Burton West

Lance Ironjaw wasn't a man to beg. But he was coming close to it.

"Dr. Polikarpov, how can we stop the Autogyro Gang? By the time the Army can get their planes into the sky, the gang is hidden in its lair."

"My boy, what you need is to be able to chase them at any time. That's why I've come up with . . . the Rocket Pack!"

This system is intended to work with the invention and gadgeteering rules on pp. B473-477 to help players come up with stats for physical devices. It requires the inventor to define the gadget as a character template, then bases Complexity on its point value; all other rules and modifiers apply normally.

Because it potentially encompasses all of the ***GURPS*** character generation system, this can be a time-consuming procedure. Moreover, this system is not intended to produce *realistic* devices! The only limits on what can be constructed are the PC's skill and what the GM is prepared to allow.

Design

The first step towards an invention is to define it as a character in terms of attributes, advantages, disadvantages, and skills. Mass and HP are defined by ST, and HT dictates ruggedness. Both DX and IQ are normally 0, except where the invention is self-directing (using its own skills rather than being operated by someone else). An existing character template, such as the robot designs in ***GURPS Ultra-Tech***, is entirely suitable starting point for this process.

Some gadgets will need to be a particular size for their job (e.g. a vehicle that has to carry people). To calculate weight from SM, assume that an SM+0 device is 150 lbs., ×10 for each +2 SM. To set ST from weight, reference the *Object Hit Points Table* (p. B558); most gadgets will be Unliving/Machine. Assume that ST and HP are equal (though some specialized gadgets, such as cranes, should have extra Lifting ST). Biological gadgets should have about half the ST/HP of an equivalent-sized machine. A gadget that can neither move nor lift anything should have ST 0, but buy up its HP to a suitable level for its size.

A vehicle's default Handling is 0, and Stability Rating equals its SM (or 1, whichever is higher). These may be modified by additional traits; Handling Bonus and Handling Penalty are modifiers to Enhanced Move (p. B52), and Stability is dealt with below.

If the inventor is modifying an existing design, the point cost of the invention is the total cost of each trait that differs from the original design. (For example, adding bigger guns to a fighter plane has a cost equal to the Innate Attack value of those bigger guns, no matter what guns were there before.) Once the overall cost of the invention in character points is determined, add 600 to that value to get its Complexity score. This replaces the Complexity rating of the standard invention system.

The GM should assign the gadget a tech level, as in the standard rules.

Example: Dr. Polikarpov, a TL6^ gadgeteer, is building a Rocket Pack (p. 32). The template costs -386 points, so its Complexity rating is 214. The GM assigns it TL7^; it's not using any ideas truly alien to its setting – just doing them a bit more efficiently.

Example: Professor Galton, a TL10 mad scientist, wants to set combat androids loose in the world to prevent inferior humans from breeding – or living. He picks the TL10 model from ***GURPS Ultra-Tech***, with the Volitional AI, Living Flesh and Infiltrator packages, for a total of 674 points. The Complexity rating is 1,274, and this is a TL10 invention.

Miniaturization

This system makes it easier to build small gadgets than large ones, even if they have the same powers. To some extent this should be allowed – a small gadget will be more fragile (have fewer HP) than a large one. If a gadget seems too small for its function, this is a good reason to push up its tech level.

Relevant Skills

The GM decides the relevant skills required to invent the item, as in the standard system. Some complex gadgets may need multiple skills (for example a scratch-built robot will need both a body and a brain, which may even be treated as two separate projects).

Concept

The minimum skill level required to conceive a device is 9 plus cube root of its Complexity (round up).

Instead of the usual modifier dictated by Complexity, the penalty to the roll for a normal inventor is -6 plus another -1 per *full* 75 points of Complexity; for a Gadgeteer, the penalty is only -1 per *full* 150 points. The other modifiers from p. B473 apply normally, and *Time Spent* (p. B346) may be used to offset large negative modifiers. Each Concept roll takes an eight-hour work day, or 1d-2 minutes for a Quick Gadgeteer.

Example: To make the Rocket Pack, an inventor needs Engineer (Flight Packs)-15. As someone with gadgeteer, Dr. Polikarpov rolls at -6 (-1 for Complexity plus -5 for the higher tech level).

Example: To create the Combat Android, an inventor needs both Engineer (Robotics) and Computer Programming (AI) at 20. Professor Galton, who does not have Gadgeteer, will be rolling at -22. He decides to take 30 work-days per Concept roll, reducing the penalty to -17.

This is great!
I am about to pull a major heist. You know the wonderflonium that I need for the Freeze Ray? It's being transported tomorrow.

– Dr. Horrible, in ***Dr. Horrible's Sing-Along Blog***

Prototype

Building a Prototype takes a number of eight-hour work days equal to 1d×(Complexity *squared* divided by 20,000); round to the nearest day, never less than one. Multiple workers may combine their efforts to reduce time spent, but all must have at least one point in the relevant skill. The base cost of facilities is $300 per Complexity point; higher TLs increase this by $600 per Complexity point per TL. Base cost per prototype is $10 per Complexity point, increased as usual for high TL.

A Quick Gadgeteer uses the same formula for time taken, but reads the result in minutes rather than work-days. Scrounging rolls are at -1 per full 200 points of Complexity (and Serendipity may well help a Quick Gadgeteer to stumble across a fully equipped workshop). Failing that, the cost is 1/100 of what a normal inventor would pay.

Example: Dr. Polikarpov will take 1d×2.3 days to build a prototype; the GM rolls 2d+1, Since the Rocket Pack is a tech level higher than his, his workshop will cost $246,600, and each prototype will cost $8,220.

Example: The first combat android prototype will take 1d×81.2 days to build (the GM treats this as 9d×9), in facilities costing $382,200, using materials costing $12,740.

Production

Use the same $10 per Complexity point to calculate retail cost for purposes of production lines.

Traits

Several new traits are needed to represent the unusual characteristics of vehicles and portable machinery on the scale of individual characters.

Disadvantages

Portable machinery is represented with a variant of No Legs.

No Legs

see p.B145

Portable: You're incapable of moving under your own power, but are compact enough to be carried around. You have Basic Move 0 in all environments and get no extra points for this; furthermore, you can't have traits that imply movement-related body parts, such as legs, wheels, tracks, fins, wings, or jets. You aren't anchored in place, though. Your shape and size let you be carried (like a weapon or gadget), worn (like clothes), attached to a vehicle, or perhaps even implanted inside another character or creature. You might even be able to pilot a vehicle or command a living host to move, although you'll count as encumbrance, unless you're carried in Payload. If you have manipulators, you have no penalty on fine work, but you get -6 DX on tasks that require the stability provided by legs, unless you're anchored to a person or vehicle with at least 10 times your mass. This includes combat, with the sole exception of firing vehicle-mounted weapons. *-30 points.*

Special Modifiers

Vehicles that are more or less stable than expected from their size can modify their Stability Rating from its default. These modifiers are applied to the Enhanced Move advantage (p. B52).

Stability Bonus

Variable

This is a more forgiving vehicle than its size would indicate. Its Stability Rating is increased by 1 for each level of this advantage. A level or two is common for tracked vehicles. +5% per +2 SR, or +3% for +1 SR. The SR cannot exceed 6.

Stability Penalty

Variable

This is a less forgiving vehicle than its size would indicate. Its Stability Rating is reduced by 1 for each level of this disadvantage (but never below 1). -5% per -2 SR, or -2% for -1 SR. The SR cannot go below 0.

Examples

These inventions range from the trivial to the highly impressive. They should be used as guidelines for the construction of further gadgets.

Typical Electronics

-642 points

This template represents a gadget weighing about 1 lb. with some complex parts, in a plastic case. It has no intrinsic function, but serves as a starting point for building more useful devices.

Attributes: ST 0 [-100]; DX 0 [-200]; IQ 0 [-200]; HT 10 [0].
Secondary Characteristics: Damage N/A; BL N/A; HP 6 [12]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 2.50 [0]; Basic Move 0 [0]; SM -4.
Advantages: Compartmentalized Mind (Controls) [25]; Damage Resistance 2 (Can't Wear Armor, -40%) [6]; Doesn't Breathe [20]; Machine [25].
Disadvantages: Blindness [-50]; Deafness [-20]; Electrical [-20]; Mute [-25]; No Sense of Smell/Taste [-5]; No Legs (Portable) [-30]; No Manipulators [-50]; Numb [-20]; Restricted Diet (Batteries; Very Common) [-10].

Backyard Moon Rocket

463 points

This atom-powered rocket ship will take its inventor and three youthful sidekicks to the moon! (And back again, once they've beaten the Nazis.) It stands 60' tall on its tail fins.

Since the rocket will be using realistic physics, the explorers need to know the delta-V budget for the mission. Using the rules from ***GURPS Spaceships***, 3G acceleration (a basic Air or Space move of 30) and 1 mps of delta-V for the vacuum phase of the trip gets the passengers to the moon in a little under three hours. The ship has a total one-way budget (including Earth takeoff and moon landing) of around 6.6 mps. Doubling that (which gives a reserve, since the landing on Earth won't need to be done under full power) gives a delta-V requirement of around 23,000 yard/second.

Attributes: ST 212 [224]*†; DX 0 [-200]; IQ 0 [-200]; HT 12 [20].
Secondary Characteristics: Damage N/A; BL 8,989 lbs.; HP 212 [0]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 3.00 [0]; Basic Move 0 [0]; Air Move 30 [48]; Space Move 30 [48]; SM +6.
Advantages: Compartmentalized Mind (Controls) [25]; Damage Resistance 20 (Can't Wear Armor, -40%) [60]; Damage Resistance 80 (Can't Wear Armor, -40%; Directional, Front Only, -20%) [160]; Doesn't Breathe [20]; Doesn't Eat or Drink [10]; Enhanced Move 5.5 (Air Speed 1,440) [110]; Enhanced Move 9.5 (Space Speed 23,040; Newtonian, -50%) [95]; Flight (Newtonian Space Flight, +25%; Temporary Disadvantage, Noisy 10, -20%) [42]; Machine [25]; Payload 9 [9]; Radiation Tolerance (PF 100) [30]; Scanning Sense (Radar; Increased Range, ×100, +60%) [32]; Sealed [15]; Telecommunication (Radio; Increased Range, ×20, +40%) [14]; Temperature Tolerance 41 [41]; Vacuum Support [5].
Disadvantages: Blindness [-50]; Deafness [-20]; Mute [-25]; No Legs (Aerial) [0]; No Manipulators [-50]; No Sense of Smell/Taste [-5]; Numb [-20].

* Includes -60% from Size.
† Includes -40% from No Manipulators.

Flower of Apollo

-384 points

This tripod-mounted arrangement of highly polished bronze plates can concentrate the sun's light into a burning beam sufficient to ignite an enemy trireme. The operator uses Gunner (Beams/TL2^). (For a *realistic* version, see ***GURPS Fantasy Tech 1: The Edge of Reality***.)

Attributes: ST 0 [-100]; DX 0 [-200]; IQ 0 [-200]; HT 10 [0].
Secondary Characteristics: Damage N/A; BL N/A.; HP 90 [180]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 2.50 [0]; Basic Move 0 [0]; SM +2.
Advantages: Burning Attack 12d (Only in direct sunlight, -30%; Takes Recharge of five seconds, -10%) [36]; Compartmentalized Mind (Controls) [25]; Doesn't Breathe [20]; Doesn't Eat or Drink [10]; Injury Tolerance (Homogenous) [20]*; Machine [25].
Disadvantages: Blindness [-50]; Deafness [-20]; Mute [-25]; No Legs (Portable) [-30]; No Manipulators [-50]; No Sense of Smell/Taste [-5]; Numb [-20].

* Replaces Injury Tolerance (Unliving) from the Machine meta-trait.

Hasty Sprinter

-30 points

This heavily modified open-formula racing car will carry two adventurers in moderate safety. It even includes blades for extra damage when sideswiping other vehicles.

Attributes: ST 50 [120]*†; DX 0 [-200]; IQ 0 [-200]; HT 12 [20].
Secondary Characteristics: Damage N/A; BL 720 lbs.; HP 50 [0]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 3.00 [0]; Basic Move 8 [25]; SM +3.
Advantages: Breath-Holding 5 [10]; Cutting Attack 5d (Melee Attack, Reach 2-3, -20%) [28]; Compartmentalized Mind (Controls) [25]; Damage Resistance 4 (Can't Wear Armor, -40%) [12]; Damage Resistance 50 (Can't Wear Armor, -40%; Only for exposed payload, -0%; Switchable, +10%) [175]; Enhanced Move 4 (Ground Speed 128; Handling Bonus 6, +30%; Selectivity, +10%; Stability Bonus 5, +13%) [123]; Infravision [10]; Machine [25]; Payload 3 (Exposed, -50%) [3]; Sealed (Switchable, +10%; Includes payload, +50%) [24].
Disadvantages: Blindness [-50]; Deafness [-20]; Fragile (Flammable) [-10]; Increased Consumption 1 [-10]; Mute [-25]; No Legs (Wheeled; Jumping allowed, -50%) [-10]; No Manipulators [-50]; No Sense of Smell/Taste [-5]; Noisy 5 [-10]; Numb [-20]; Restricted Diet (Gasoline; Common) [-20].

* Includes -30% from Size.
† Includes -40% from No Manipulators.

Magnetic Saw Watch

-590 points

This stylish watch contains both a powerful electromagnet and a convenient electric saw. It needs to be recharged once per day.

Attributes: ST 0 [-100]; DX 0 [-200]; IQ 0 [-200]; HT 10 [0].
Secondary Characteristics: Damage N/A; BL N/A; HP 4 [8]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 2.50 [0]; Basic Move 0 [0]; SM -6.
Advantages: Absolute Timing [2]; Compartmentalized Mind (Controls) [25]; Cutting Attack 3d (Melee Attack, Reach C, -30%) [15]; Damage Resistance 2 (Can't Wear Armor, -40%) [6]; Doesn't Breathe [20]; Machine [25]; Reduced Consumption 2 [4]; Telekinesis 10 (Magnetic, -50%) [25].
Disadvantages: Blindness [-50]; Deafness [-20]; Electrical [-20]; Mute [-25]; No Sense of Smell/Taste [-5]; No Legs (Portable) [-30]; No Manipulators [-50]; Numb [-20].

Multi-Scanner

-537 points

This portable sensor combines a variety of useful detectors into a single platform.

Advantages: Detect (All electromagnetic radiation; Analyzing, +100%; Short Ranged 1, -10%) [57]; Discriminatory Smell (Profiling, +50%) [23]; Scanning Sense (T-Ray Vision; see ***Ultra-Tech*** p. 30) [25].
Disadvantages: Typical Electronics (see p. 31) [-642].

Pocket Air Tank

-594 points

This 7"-long air tank and mouthpiece give a six-minute air supply for a full-size human. (Extra levels of Breath-Holding are used to scale up the duration to compensate for size.)

Attributes: ST 0 [-100]; DX 0 [-200]; IQ 0 [-200]; HT 10 [0].
Secondary Characteristics: Damage N/A; BL N/A; HP 4 [8]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 2.50 [0]; Basic Move 0 [0]; SM -6.
Advantages: Breath-Holding 5 [10]; Compartmentalized Mind (Controls) [25]; Damage Resistance 2 (Can't Wear Armor, -40%) [6]; Doesn't Breathe [20]; Doesn't Eat or Drink [10]; Machine [25].
Disadvantages: Blindness [-50]; Deafness [-20]; Mute [-25]; No Sense of Smell/Taste [-5]; No Legs (Portable) [-30]; No Manipulators [-50]; Numb [-20].

Rocket Pack

-386 points

A gadgeteer classic, this 20-lb. backpack lets the wearer fly for two hours, fast enough to catch up with most propeller-driven aircraft. It doesn't provide any environmental support, and the intrepid pilot – using Piloting (Flight Pack) – should probably also wear some armor.

Attributes: ST 12 [20]; DX 0 [-200]; IQ 0 [-200]; HT 12 [0].
Secondary Characteristics: Damage N/A; BL 20 lbs.; HP 12 [0]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 3.00 [0]; Basic Move 0 [0]; Air Move 15 [24]; SM -2.
Advantages: Compartmentalized Mind (Controls) [25]; Damage Resistance 2 (Can't Wear Armor, -40%) [6]; Enhanced Move 3.5 (Air Speed 180; Enhanced Handling 1, +5%) [74]; Flight [40]; Increased Consumption 2 [-20]; Machine [25]; Payload 10 (Exposed, -50%) [10].
Disadvantages: Blindness [-50]; Deafness [-20]; Fragile (Flammable) [-10] Mute [-25]; No Legs (Aerial) [0]; No Manipulators [-50]; No Sense of Smell/Taste [-5]; Noisy 5 [-10]; Numb [-20]; Restricted Diet (Jet fuel; Common) [-20].

Two-Way Wrist TV

-532 points

This improvement on a standard walkie-talkie allows for video conversations across a large city. It needs to be recharged once per day.

Attributes: ST 0 [-100]; DX 0 [-200]; IQ 0 [-200]; HT 10 [0].
Secondary Characteristics: Damage N/A; BL N/A; HP 4 [8]; Will 0 [0]; Per 0 [0]; FP N/A [0]; Basic Speed 2.50 [0]; Basic Move 0 [0]; SM -6.
Advantages: Compartmentalized Mind (Controls) [25]; Damage Resistance 2 (Can't Wear Armor, -40%) [6]; Doesn't Breathe [20]; Machine [25]. Reduced Consumption 2 [4]; Telecommunication (Radio; Increased Range, ×2, +10%; Video, +40%) [15].
Disadvantages: Electrical [-20]; No Sense of Smell/Taste [-5]; No Legs (Portable) [-30]; No Manipulators [-50]; Numb [-20]; Restricted Diet (Batteries; Very Common) [-10].

About the Author

Roger Burton West is a British computer wrangler, who created several prototypes, most of which are not ready for mass-market production. His gaming website is **tekeli.li**.

All I had to do was reverse the polarity. That solves ninety percent of most superscience problems.

– A. Lee Martinez, ***Emperor Mollusk Versus the Sinister Brain***

What Is Weird Science?

by Cal Godot

GURPS *Fourth Edition* defines Weird Science as a skill that enables the character to devise "crackpot scientific theories that are far ahead of their time. . . or at least utterly different from the usual assumptions of your tech level." This broad description might seem to include the "punk" technological variations like steampunk or dieselpunk. But weird science is something beyond mere technological divergence, far more than a clever TL5 Victorian engineer devising new uses for TL6 steam power. Weird science allows someone to combine Tesla's engineering concepts and Reich's orgone energy to devise something that functions like a TL12^ matter transporter, using only vacuum tubes, various crystals, a Tesla coil, and some parts from an orgone accumulator.

Weird Science, Magic, or Psionics?

Psionics is commonly refered as a method of permitting magic-like powers and effects in non-magical settings. Psionic abilities such as telepathy, mind control, and telekinesis certainly have their spell equivalents, sometimes even bearing the same name. Many magic spells (Dream Projection, Dream Sending) are obviously psychic in nature, and can certainly be converted to non-magical mental powers.

If the GM finds psionic characters too powerful and magic too complicated to easily manage, weird science can be used to introduce effects similar to magic and psionics into games where the settings don't allow for those forces (or where the GM would rather not bother dealing with those rules).

Of course, a weird-science campaign doesn't have to *exclude* magic or psionics. ***GURPS Psi-Tech*** could be considered a weird-science supplement, with the descriptions of Kirlian photography and psychotronic generators falling definitely within weird-science (or weird-engineering) territory. Most of the technology described in ***Psi-Tech*** is aimed at enhancing the abilities of existing psionics. Weird science would take this a step further, utilizing theories of electricity and psychology (perhaps even brain chemistry) to enhance not only the powers of the psionically gifted but also to bestow psionic gifts on the mundane. Such powers are entirely dependent on weird devices, which are subject to their own particular set of weird effects when they critically fail. (See the *Random Side Effects Table,* p. B479.)

Likewise, in a no-mana setting, weird science could be essential to the functions of alchemy and herb lore. In a high- or very-high-mana setting, "magical energy" might be one of the various forms of radiation studied by scientists and control by engineers. Spellcasters manipulate mana with words and gestures; weird scientists do it with transistors and crystals.

Alchemy seems to straddle a line between magic and weird science. The classic alchemical theories depend upon an assumption that some chemicals and compounds have inherent magical energy (in ***GURPS*** rules, this would be mana). Other alchemical models call for elements and compounds to have spiritual characteristics or be empowered by emanations from the astral plane. Later alchemists, many of whom were "natural scientists" and products of the Enlightenment, rejected "magical thinking" and spiritual explanations to focus on understanding the physical processes that were occurring within the observed chemical reactions. What were previously considered inherent magical properties became ascribed with elemental or even atomic properties, and their methodical processes and refusal to accept magical thinking for answers led to the development of physical and organic chemistry. However, they still lacked an understanding of the subatomic, and so even as they began to turn away from magic as an explanation and embrace naturalist methods, they developed speculative and often wild explanations. Late alchemy – roughly during the time of Newton (a master alchemist himself, it is widely accepted) – could be treated as weird science instead of magic.

Weird Medicine

Alternative medical theories not based on religious teachings are weird science, but are also covered in theory and practice by the Esoteric Medicine skill. Although most esoteric medicine is founded on religious or magical teaching, contemporary practitioners of energy healing are increasingly appropriating the language of quantum physics to describe a working theory. Many attempting to take a more scientific approach claim to identify and utilize body processes or energies unknown to "Western medicine."

The same could be true of Herb Lore and herbal-based potions. Contemporary alternative medicine advocates claim certain herbs and plants have physical properties that have been overlooked by contemporary scientists (see *Weird Medicine,* p. 33). More than a little practical method and solution can be found in what is termed "folk medicine"; any number of plants have medicinal properties from which some established cures are derived, so there is some validity to the claims of herbal-healing practitioners. However, their wilder allegations of curatives and medicines that have miraculous properties are rejected by established science and often considered "crackpot," thus well within the established definition of weird science. If the explanation for the curative powers of a particular plant isn't magical, it could be considered weird science ("weird botany").

Historical Weird Science

Examples of weird science abound in fiction, but what about *realistic* weird science, or weird theories derived from real-world observations and experience? Despite the official game description of weird science as "crackpot," such theories are not limited to the fringes of mainstream science. A method of finding historical weird science is to locate a point on the historic timeline when a significant scientific discovery was made (for example, when German scientist Alfred Wegener announced his hypothesis of continental drift in 1912 – the early 20th century was a rich time for weird science). In most cases, you can work backward to find a number of previous attempts to explain a certain observed event. Many of these proposed (and later rejected) theories are fine examples of weird science.

Sometimes a theory that seems at first crackpot later becomes the defining theory of a science – the continental-plate drift theory is a fine example of this. The theory was first proposed, based purely on a study of various maps, by a Flemish cartographer in 1596. Through the following centuries, earth scientists scoffed at the notion that the continents are in motion. Existing geological evidence did not seem to support the theory – indeed, anyone with "common sense" would reject the notion that massive land masses are in motion! Wegener began compiling evidence in 1912. By the 1950s, the theory began to be integrated into mainstream geology. A weird theory that once defied scientific reasoning and common sense eventually gained widespread popular acceptance – it is now commonplace for even children to note the continents can be fit together like a jigsaw puzzle.

Weird theories are also sometimes derived from mistaken research. The Martian Canals are a good example of this. Percival Lowell's observations gained instant media traction and became accepted truth, resulting in published observations about Martian society, descriptions of Martian activities, and eventually stories of psychics who claimed to have visited the red planet. Better optics resulted in the sudden disappearance of the canals and they have long been repudiated by scientists. Even so, to this day, some people expect to see the canals when they visit a planetarium. Indeed, the "Martian face" controversy and other present-day weird-science claims show this to be a belief with continuing resonance. Popular beliefs and (mis)conceptions regarding science are a fine source of weird theories.

Occasionally a weird theory takes hold and, without any competing theories, begins to become accepted scientific theory. Prosper-René Blondlot was a well-known and distinguished French scientist who he claimed to have discovered N-rays in 1903. While experimenting with the polarization of X-rays, Blondlot photographed the spark between two electrodes in an X-ray beam and noticed changes in the brightness. He quickly attributed these changes to a new type of radiation, which he termed N-rays (named for the University of Nancy where he was performing the experiments).

> *Imagination is as vital to any advance in science as learning and precision are essential for starting points.*
>
> *– Percival Lowell*

Game the Controversy

Biology has its own history of weird theories regarding the origin of life, an area of inquiry long dominated by religion. The few scientists who dared attempt to describe the mechanisms of creation and the complexity of nature devised an interesting array of theories, some of which (like how the giraffe got its long neck) are still commonly accepted by nonscientists. It wasn't until the observations of a wandering naturalist named Charles Darwin that the sciences of biology and medicine formalized a theory of life that sought to explain everything from the common traits creatures inherit to the diversity of the species.

The theories of creationism or "intelligent design" constitute a rich and historic body of potential weird science that has some application in fantasy gaming. An alternate Earth where the theories of evolution don't hold true might utilize some of the strange creatures that creationists have envisioned in their attempts to explain dinosaur fossils. Likewise, an alternate "young Earth" – a fully developed mirror that actually is only 6,500 years old – could pose an interesting puzzle for I-Corps scientists.

Over 100 fellow scientists claimed to have replicated Blondlot's results; every living creature was said to emit the radiation, and many said that they had photographed the "aura" of plants, animals, and humans. The existence of N-rays was gaining acceptance until Lord Kelvin and several other prominent physicists announced they were unable to produce the described results. Further investigation revealed numerous flaws in the methodology of those scientists who thought they had observed N-rays, most of them falling victim to experimenter bias.

One of the most famous weird scientists was a young member of Sigmund Freud's inner circle named Wilhelm Reich, who in the 1930s proposed the existence of orgone energy. Reich claimed this energy was the ordering principle of the universe, a force that worked to counter the effects of entropy. Reich believed that orgone energy existed within each and every living being, flowing through them and connecting them in a universal matrix of life (not unlike the Force in *Star Wars*). Reich went on to develop "orgone accumulators," chambers that enhanced the orgone energy of the individual and helped them heal physical and even mental illnesses. Reich also claimed orgone energy could be used to manipulate the weather, and is said to have successfully demonstrated one of his "cloud-busters" to a number of onlookers. Reich was ultimately prosecuted and imprisoned by the federal government for his devices; his papers and devices were impounded or destroyed.

Nikola Tesla similarly had his unpublished papers and theories posthumously seized and classified secret by federal authorities. Among the devices envisioned by Tesla was a "death ray," a disintegrator beam that would operate over vast distances. Many point to the government seizure of his papers as proof that Tesla's design was successful. It certainly takes little stretch of the imagination to see a direct line from Tesla's death ray to contemporary plans for space-based lasers and tank-mounted heat-rays. A portable death ray has obvious applications in gameplay and a resourceful weird gadgeteer-armorer might construct a hand-held model. The weaponization of electricity is an obvious application, but Tesla also believed in the therapeutic powers of electrical power. He had a number of ideas and even designs for machines that would use electricity and heat to heal common illnesses. He also theorized that the brain produced electrical energy and likely functioned somewhat like a calculating machine. "Teslapunk" weird engineering and scientific theory could be behind any number of the items described in ***GURPS Psi-Tech, Bio-Tech,*** and, of course, ***Ultra-Tech.***

Ultimately, weird science is certainly as colorful and flexible as magic and psionics, and provides as satisfying a gaming experience for gearheads, geeks, and those who are technically inclined. With imagination and ingenuity, a resourceful GM can design a well-developed world of weird science and engineering that will provide unlimited opportunities for adventure and glory.

Weird-Science Supers

The powers of four-color heroes are often the result of weird science. Real-world radiation would kill the spider that gave Peter Parker his powers, and if the arachnid did survive to bite you, you'd likely only *think* you were climbing the walls as your internal organs slowly succumbed to the radioactive toxins in your bloodstream. Barry Allen's laboratory mishap would have resulted in a Flash-like dash for the chemical shower, but it's unlikely such an accidental bath would result in anything other than severe burns (or even death). A certain familial foursome would have all died horrible deaths about six months after an unprotected dance in a cosmic storm. Bruce Banner would have been blasted into bloody vapor instead of transformed into a green giant.

Moments like these are weird science at its finest. Although the writers typically didn't bother with a theoretical explanation, the changes nonetheless resulted from chemical or biological processes rather than magic or psionics. Sometimes the chemicals result in psionics, but that's still weird science.

About the Author

Cal Godot has been a student of weirdness for most of his life. He has investigated claims of psychic powers, swamp monsters, time travelers, vampires, and ghosts in his lifetime, but has yet to discover anything weirder than everyday life in Los Angeles.

It is true that some of them have had to do with wireless telegraphy and that in addition to the tower and poles there is a hole dug in the ground. This is 150 feet deep and is used in these experiments. The people about there, had they been awake instead of asleep, at other times would have seen even stranger things. Some day, but not at this time, I shall make an announcement of something that I never once dreamed of.

– Nikola Tesla

Random Thought Table

Out Standing in My Field, All Alone

by Steven Marsh, *Pyramid* Editor

A hundred years ago, "I want to replace one of your heart valves with a pig's" is a sentence with the same finality as "I'm going to clean out your earwax by using this Colt .38 in your ear canal." Today, it's one of a myriad of options, such that someone might rightly ask, "Hmm . . . is replacing a broken body part with a pig's the *best* idea in this case?"

Here's the thing about weird science: If only you are doing it, it's *weird.* If the rest of the world is doing it, it's *science.*

I'm sure there are counterexamples, but the key of "weird science" seems to be "limited" – not in effects, but in practitioners. For the purposes of this article, let's assume for the moment that "weird science" is closely aligned with "personal science." How can we play up that aspect of weird science in our games? Here are some humble suggestions.

> *As long as you hit that wire with the connecting hook at precisely 88 miles per hour the instant the lightning strikes the tower . . . everything will be fine.*
>
> *– Dr. Emmett Brown, in* ***Back to the Future***

The Touch

As discussed by Sean Punch on pp. 4-6, some settings explicitly explain that weird-science abilities are a manifestation of the scientist's own abilities – whether these are "super"-scientific (such as the game ***Aberrant***), techno-magical (such as ***Mage: The Ascension***), or inherently racial (such as various tech-wielding weirdos in various ***Dungeons & Dragons*** settings). In other words, if a weird-scientist whips up a hover-platform, it'll only work right for him. In others' hands, it'll either refuse to power up, break down quickly, or just plain not work right.

In games, the biggest reason for this is balance. If the scientist can make up earth-shattering gizmos that work right for anyone, the campaign will quickly degenerate into "whose scientist can outfit which side with more power."

In stories, the additional wrinkle exists of keeping the character special. If all the characters in the story have their own focus (and perhaps niche protection – *see Pyramid #3/44: Alternate* ***GURPS*** *II,* pp. 33-34) *and* they have snazzy gear supplied by the team inventor, then the inventor doesn't have much going for him that the rest of the team doesn't also have.

The default presumption in many games is that this connection the gear has to its inventor is supernatural in some fashion. However, this doesn't need to be the case; it's entirely possible to justify from a mundane perspective. What if the science involved is so finicky, precise, and unknown that it requires the scientist to constantly monitor the equipment? This is relatively common in the real world: Many computer systems end up a combination of kludges, patches, and quirks that only the system's administrator fully understands, and most personal workshops end up being highly customized to the work habits of the owner.

So, sure, maybe the inventor *could* whip up a suit of powered armor for his teammates. However, that occasional power-leak route (which has three broad exceptions and two common specific ones) requires a tweak that takes about two seconds if you *invented* the armor and are wearing it . . . and about two minutes if you didn't. It's also notoriously difficult to tell someone else how to make the adjustments.

The notion of personal tweaking by the weird-scientist can lead to a hierarchy of sustainable innovation, permitting controlled access to gear.

- The really, really cool stuff (which needs to be tweaked constantly): The scientist's personal gear.
- Cool stuff (which needs to be tweaked periodically, or per use): The scientist's allies and close friends.
- Fairly cool stuff (which needs to be tweaked weekly or monthly): The scientist's neighborhood or city.

Thus the scientist can have teleportation goggles and overload gauntlets himself, supply his allies with superscience armor and water-breathing elixirs, and outfit the city with a supersonic subway and borough capacitors.

This need for a personal touch to keep gear working seems to be the limiting factor of Dr. Emmett Brown – especially as portrayed in *Back to the Future: The Game*. He has lots of amazing personal gizmos that barely work, fairly miraculous goodies he shares with his friend Marty McFly, and – in one episode of that series – odd (but mostly mundane) marvels that he uses to advance the city beyond normal limits. Given the hands-on nature of Dr. Brown in the city, it's logical to presume that he can't extend his reach beyond the city . . . again, probably because it'd all fall apart if he weren't able to go fix it at a moment's notice.

Follow the Money

Perhaps cynically, modern sciences often revolve around the principle question of "How can I make money at it?" Even if it's a mostly theoretical pursuit, there is still an undercurrent of utility that cuts across most sciences – even if it's not immediately useful *today,* it might be useful in the future. This explains why your average astrophysicist is often able to make more money than (say) a doctor in Napoleonic history; it's hard to sell that French history to the military.

Thus weird-scientists might be fringe and limited in a setting because they haven't figured out how to make any money at it. A weird-scientist might be the renowned expert on (say) cryogenic freeze rays, but if no *need* to instantly turn stuff really cold exists, then the world might be content to let him tinker with handheld freeze rays in relative quiet.

Presuming that some of Nikola Tesla's unworked theories had merit, the relative lack of profitability in those ideas is likely to be the reason he remained relatively unknown. It doesn't matter if you can figure out how to broadcast power without the use of wires if it's much more expensive than simply *using wires*.

Who Mixes Computer Science and Botany?!

Anther way to limit weird science is to make it combinational. In other words, weird scientists aren't weird because of what they know in one field, but how they combine it in multiple areas. For example, Doctor Octopus from the Marvel comic universe is one of the foremost experts on radiation *and* cybernetic appendages; that's how his arms work. Sure, other folks probably could do what he does, but that'd involve performing doctorate-level research on particle physics and crazylimbology; that's a lot of work for not much payoff.

Even if a weird-scientist proves the possibility of some hitherto uncombined sciences, it's still likely to be some time before the rest of the world can catch up – presuming the two sciences are able to be combined easily. If an unusual scientist is the only one who's synthesized his two fields into Something Cool, then he may have a monopoly on his ideas for quite some time . . . especially if he's not publishing, sharing his findings, etc. This is likely how Victor Frankenstein maintained his edge: As an advocate of chemistry, biology, and physiology, he alone was likely to have the expertise to combine them into Something Weird (which, in no coincidence, is also difficult to monetize immediately).

> *Dr. Ray Stantz: You know, it just occurred to me that we really haven't had a successful test of this equipment.*
>
> *Dr. Egon Spengler: I blame myself.*
>
> *Dr. Peter Venkman: So do I.*
>
> *Dr. Ray Stantz: Well, no sense in worrying about it now.*
>
> *Dr. Peter Venkman: Why worry? Each one of us is carrying an unlicensed nuclear accelerator on his back.*
>
> **– *Ghostbusters***

Put It All Together

As a famous case study, let's look at arguably the most renowned fictional representation of "weird science" in the past 50 years: the Ghostbusters.

The heroes' gear is all the brainchild of Egon Spengler. Given the general unease the rest of the team holds toward the equipment, it's quite likely that the gear requires constant tinkering to keep in working order. Egon doesn't affect many citywide changes, but the Ecto-Containment Unit requires a constant power source (and quite possibly other maintenance).

In the Ghostbusters' universe, there doesn't seem to be much money in ghostbusting. The protagonists don't face any competition in either of the two films, and – in fact – their relative "success" means that they are nearly without work as of *Ghostbusters II.* Until someone else is able to turn their weird science into a larger money-making venture, it's likely to remain on the fringes.

Finally, Egon seems to possess an astonishing blend of mystic- and science-related lore that he melds together. It's quite unlikely other scientists in the Ghostbusters' universe will catch up to his expertise anytime soon . . . which will keep his efforts firmly in the realm of the weird.

While there are several mystical and artificial reasons why the Ghostbusters remain on the fringe, it's worth nothing that the heroes are kept out of the limelight by entirely *mundane* means (bad press, politics, etc.) as well. This can be the case in *any* setting. The real world is more than willing to ensure that some geniuses remain unsung . . . no matter how cool their gravity cannons are.

About the Editor

Steven Marsh is a freelance writer and editor. He has contributed to roleplaying game releases from Green Ronin, West End Games, White Wolf, Hogshead Publishing, and others. He has been editing *Pyramid* for over 10 years; during that time, he has won four Origins awards. He lives in Indiana with his wife, Nikola Vrtis, and their son.

Odds and Ends

Enweirden the Mundane

If the mostly mundane innovations of Ferris Bueller, Rube Goldberg, and Emmett Brown have taught us anything, it's that *how* you do something can be just as weird as *what* you're doing.

This month's *Random Thought Table* (pp. 36-37) provides individual insight into why some inventors' unusual gear *wouldn't* be more prevalent. Now, why *would* it be? Here are a few broad ideas.

- *It's more effective.* Whatever it does is simply better than the alternatives.
- *It does something similar equipment cannot.* Perhaps it combines functions of two otherwise-unrelated gizmos. Maybe it has an added feature that doesn't come up very often.
- *It works in situations the regular gear doesn't.* Especially if the scientist needs to go places the rest of the world doesn't (space, underwater, underground, Delaware), the weird-science equipment might be tailor-made for those situations.

And what additional reasons might keep it less widely spread?

- *It has side effects.* This device imparts various nuisances (or worse) on those who use it . . . or those nearby.
- *It doesn't work as well or often as it should.* A gizmo that's 50% more effective but fails 30% of the time might not be worthwhile.
- *It's an awkward size.* Weird-science doodads are often simply bigger than their counterparts. They may weigh more, have worse Bulk ratings, etc.
- *It's expensive.* If a piece of weird science would cost five times as much for a 20% increase in effectiveness, it might have a hard time finding an audience.

Put it all together, and here are a few back-of-the-envelope ideas for how to tweak existing weird-science gizmos.

- *Patch armor:* A variant on the ballistic vest (p. B284), the patch armor provides improved protection (DR 16/4). However, each piercing or cutting attack causes it to ooze a polymer that immediately hardens; this polymer needs to be replenished periodically (after 30 points in absorbed damage). This polymer also smells terrible, perhaps incurring reaction penalties, bonuses to detect the user, penalties due to distraction, etc. It's also bulky and difficult to wear.
- *Foe-stun grenade:* Similar to the TL8 stun grenade (p. B277), the effects of this grenade don't affect those who have prepared by drinking a foul-tasting cocktail no more than 10 minutes ahead of time. At least, it *shouldn't* work on them; due to some quirk in the elixir, it has a 1-in-6 chance each time it's imbibed of failing to provide any protection whatsoever . . . and there's no way to know if it worked without testing it on a live grenade. The weapon is also four times the size and cost of a standard stun grenade, and awkward to throw.
- *Aquaflame Thrower:* Statistically identical to the flamethrower (p. B281), this weapon can even be used underwater. However, after each use, the wielder needs to make another Liquid Projector (Flamethrower) roll to "snap off" the flaming material from the weapon's nozzle (similar to tapering off the goo of a caulk gun); failure to do so means the flame can travel up to the mysterious liquid's source . . . which is likely to be catastrophically bad.

Murphy's Rules

by Greg Hyland

Appendix Z
Super Costumes

by Christopher R. Rice

For players who want more detailed rules for costumes and supersuits than those found in ***GURPS Supers,*** the following optional rules can be used.

A costume is an outfit distinctive colors and design, including footwear, gloves, and (possibly) a mask or cowl. It effectively covers your entire body. While it is durable enough to stand up to most physical activity, such as combat, it provides no damage resistance or any other protective advantage (though see the *Protective* modifier below). A costume has a default Status of 0, though it may be bought at any Status level desired at a proportionately higher cost, at allowing you to use your own personal Status level (if higher). Regardless of the Status level of your costume, it never gives a bonus (or a penalty) to discern your identity. Costs 40% of cost of living; weighs 6 lbs. (TL0-6), 4 lbs. (TL7), or 2 lbs. (TL8+).

The following modifiers can be added to a costume.

Attractive: Your costume is a step above the rest, whether it's a custom or unique color, glows when you use your powers, etc., it gives a reaction or Influence roll bonus in scenes where the costume is the center of attention, or to others rolls to recognize you (including the rolls for Reputation): +1 for +1 CF, +2 for +4 CF, and +3 for +9 CF.

Bad-Weather: Your costume has been designed to resist the effects of hostile climates, including cold weather, tropical heat, humidity, severe temperature conditions, and so on. While wearing it, not only do you get minor benefits to feel comfortable in any normal weather conditions, you gain 2 levels of Temperature Tolerance, adding your HT to both ends of your preferred temperature band. If this feature makes your costume bulky and unattractive (doubling the base weight), this is -0.25 CF; if it has no effect on the outfit's appearance or weight, it costs +0.75 CF.

Improvised: Made out of whatever materials you have at hand, whether it's curtains, pillowcases, or whatever. It might protect your identity, but it looks ridiculous, giving those who see you a -1 to reaction rolls and prevents rolls to identify you via any Reputation you might have. Optionally, the GM may rule that improvised costumes are "free." Improvised cannot be combined with *any* other option here. -0.8 CF.

Protective: Your costume provides a form of protection in addition to its other properties. This is usually either DR 5 vs. burning, DR 5 vs. corrosion, or Radiation Tolerance (PF 10). However, instead of a fixed advantage, the GM may allow you to purchase other protective advantages totaling up to 10 character points. If you have a *regular* suit of armor that serves as your costume, the GM should combine the cost of the costume and the suit of armor – the weight remains the same. +10 CF.

Skintight: Your costume fits you perfectly and has effectively no thickness; you can wear it under your civilian clothing without bulges and without anything showing. Alternatively, you can put your costume on *over* other clothing and look as if you were wearing nothing under it. The GM might require those with this modifier on their costume to take the Skintight perk (***Supers,*** p. 30, or ***GURPS Power-Ups 2: Perks,*** p. 14). This is considered superscience technology. This halves base weight. +40 CF.

Supersuit: This costume can withstand the wearer's superpowers. For example, if the wearer has fire abilities, it will not catch fire when he bursts into flame or holds a fireball in his hand. The GM might require those with this modifier on their costume to take the Supersuit perk (***Supers,*** p. 30, or ***Power-Ups 2,*** p. 9). This is considered superscience technology. This doubles base weight. +40 CF.

Any other modifiers that can be added to clothing may also be added to costumes. The following features are especially useful: camouflage clothing (***GURPS High-Tech,*** pp. 76-77), scent-masking (***High-Tech,*** p. 77), undercover clothing (***High-Tech,*** p. 64), buzz fabric (***GURPS Ultra-Tech,*** p. 39), invisibility surface (***Ultra-Tech,*** p. 100), responsive fabric (***Ultra-Tech,*** p. 39), and varicloth (***Ultra-Tech,*** p. 39).

Example: Dr. Khaotic has decided that – along with his new doomsday device – he will also have a new costume. Since his Status is 0, he decides his costume might as well reflect this. Not wanting to get burned again by Valkyrie's fireballs, and having access to variable molecular cloth, he adds the Protective (giving DR 5 vs. burning attacks) and Supersuit qualities, for a net +50 CF. His costume thus costs $12,240 and weighs 4 lbs.

About the Author

For more details about the superpowered Christopher R. Rice, see *Metatronic Generators* (pp. 16-23). He thanks L.A., his own personal muse, as well as the rest of his gaming group, and his good friend Antoni Ten Monrós for being a sounding board and some additional ideas on costumes and supersuits.

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