

THE DRINK TANK ISSUE 147



SCIENTIFICALLY ENGINEERED

Though I have little scientific background, I love me some science. I get Science news sent my way, I pay attention to various science reports on TV or NPR and I basically try and keep up a little. True, I don't understand a lot of it, but I do what I can.

And so here's what I've got for this issue: Frank Wu on germs, Robert Hole on a book on Teleportation, SaBean MoreL on a sexy science project she was a part of and something from me too!



KILLER GERMS IN SPACE!

by Frank Wu

Deadly bacteria shot into space... return to earth even deadlier!

Outer space makes lethal bacteria faster killers!

Pestilence falls from the heavens!

Oh no!

Histrionics have accompanied a new report that a trip on the space shuttle *Atlantis* made a deadly strain of *Salmonella* more deadly.

I thought it'd be fun and instructive to take a scientific look at this finding.

In September last year, the space shuttle *Atlantis* blasted off to add a truss assembly and new solar panels to the International Space Station. They also took several experiments, including the *Salmonella* experiment. These germs cause food poisoning, in the form of horrific diarrhea. When the live germs returned from their space jaunt, they were fed to rats. Separate rats were fed equivalent live germs grown on earth, at normal gravity. At a dosage of ten billion cells (the number in about 1/50 of a teaspoon), half of the rats fed earth-grown bacteria died, but almost all of the rats fed space-

grown germs died. That means that, at a certain dosage, the space germs were about twice as deadly as their earth-bound brethren. They were also swifter killers, the rats succumbing about five days earlier.

This is the first time any scientist had found that a trip into space made deadly germs deadlier.

But, in a way, it wasn't too surprising.

For years Cheryl Nickerson and her pals at Arizona State University have been studying the effects of microgravity on *Salmonella*. They did this, even though they and their microscopic subjects never left the earth.

How?

By using a device developed a few years ago by NASA called the Rotating Wall Vessel, or Rotary Cell Culture System (RCCS).

This machine contains a slowly-spinning chamber filled with growth medium. Cells in the chamber are falling, but the spinning prevents them from hitting the sides or floor of the chamber.

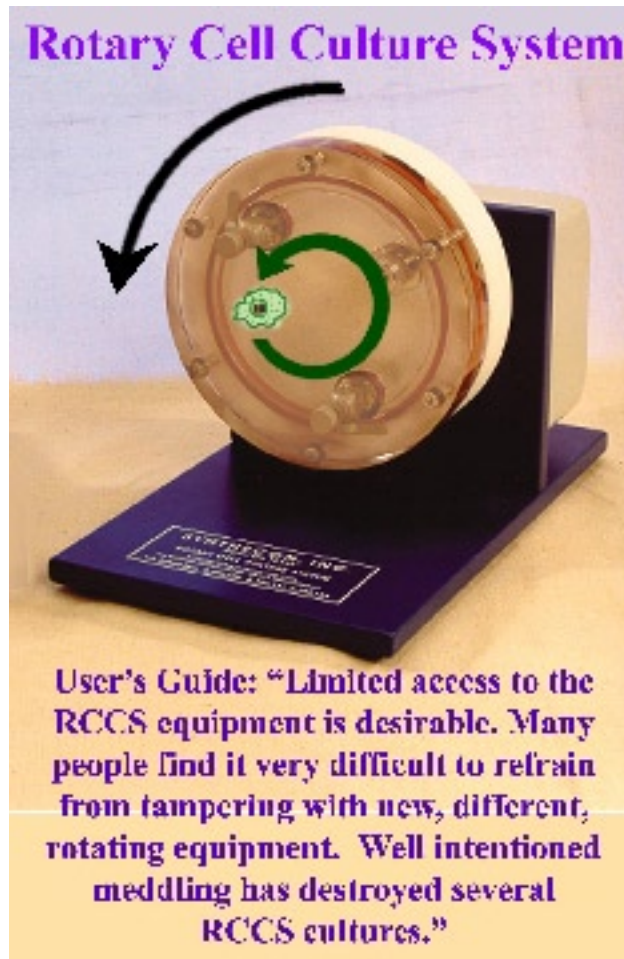
The RCCS is remarkable because it allows the cells to grow in a more normal environment than on a Petri dish. In the body, cells physically

touch and trade proteins and other chemicals with surrounding cells. They are not squashed flat against a hard plastic dish. In the rotary culture, the cells float, touching only fluid and other cells. The result? Chondrocytes (cartilage-making cells) make matrices like cartilage in the rotary culture, but not when grown on dishes. Also, different types of cells can be grown together - as in the body. This allows formation of delicate, complex structures similar to normal tissues. Some artificial tissues for transplant are grown in rotary systems.

Dr. Nickerson made an interesting discovery when she grew *Salmonella* in the rotary culture. Some of the genes were turned on or off - simply by subjecting the cells to simulated micro-gravity.

The pattern of gene expression in the cells was significantly altered.

Think of a cell as a big factory that can make many different things simultaneously. The factory has a computer storing a thousand blueprints. A worker is handed an instruction sheet listing 250 things, and he prints out their blueprints. These blueprints are handed down the line and these 250 things actually made. (In this analogy, the computer is the single bacterial chromosome,



the instruction sheet is the RNA polymerase, and the blueprints are the messenger RNAs. The final products are proteins.)

Not all of a cell's genes are turned on at any given time. Which genes are turned off (and consequently which proteins aren't made) is determined by the environment. If a particular sugar isn't in the medium, a cell won't bother making the proteins to digest it. There are whole sets of

genes that a bacterium turns on to cope with different types of stress. Too much acid, or alcohol, or heat, or salt - all these stresses cause the bacterium to turn on different genes.

It turns out that a whole set of genes is turned on by the micro-gravity of space, and those are the genes that make the bacteria deadlier.

(Note that the cell itself is not *mutated*. That would be akin - in our analogy - to deleting some of the blueprint files in the factory's computer. Outer space simply affects which blueprints are printed out and used.)

We'll discuss which genes are turned on in a moment (it's quite interesting).

But first I want to explain more about the actual experiment that was done.

Identical cultures of *Salmonella* were grown on earth and in the shuttle. Earth-bound scientists were actually in communication with the astronauts, controlling the temperature and humidity to match the real-time conditions in space. The spacers told them when they were starting the cultures growing, when they were adding growth medium. Everything was done so the earth conditions matched those in space - except for the

gravity.

Some of the cells in space were killed and put in preservative, so Nickerson and friends could check on their gene expression.

Other cells were kept alive for feeding to rats. Rats were given different numbers of cells, from ten thousand to one billion, at ten-fold increments. (One billion cells is the number that can be grown in 10 milliliters, or about 2 teaspoons.) Different sets of rats were given earth- or space-grown germs. At the lowest dosage (ten thousand cells), all the rats lived. But at all the higher dosages, the space-grown cells were more deadly.

This confirmed a result obtained from the rotary culture systems. *Salmonella* was not only deadlier grown in simulated micro-gravity in a lab, but also when grown in *actual* micro-gravity in space.

But what was actually happening to the cells?

Which genes were being turned on or off?

And what was the control factor messing with gene expression?

The answer to the last question turned out to be a protein called Hfq. (“Hfq” stands for “Host Factor for

virus Q-beta replication,” the function for which the protein was originally discovered, and a factoid which plays no other part in our narrative.)

In our factory analogy, Hfq would be like a meddling supervisor who sticks post-it notes on the list of blueprints to be printed. He also tears up some of the blueprints as they come out of the printer and sticks post-its on others.

Out of around 250 proteins that are made by the cell at a given time, Hfq increases or decreases expression of about a third of them.

Many of the genes turned on are involved in the bacterial equivalent of “fight or flight.” And that equivalent is two-fold: (1) Have as many babies as you can; or (2) stick together, because there is safety in numbers.

Allow me to anthropomorphize the bacteria. Stressed-out bacteria in a toxic and poisonous environment do not just give up, waiting around to die. Rather they have as much sex as possible. This is in the form of making a long rod-like structure called a pilus (I’m not making this up). The pilus projects out of the “male” bacterium and sticks to the “female.” DNA comes out of the male, snakes down the pilus and into the female.

This sort of sex is entirely



promiscuous. A bacterium will mate with its own kind, or even with members of completely different species. (This is also one mechanism by which resistance to antibiotics passes from one germ to another.)

Stressed-out bacteria in space also divide more quickly. Thus, through these various techniques, the space bacteria try to spread their genetic material around as much as possible, hoping that at least some of their children will survive.

Another thing that stressed-out bacteria will do is clump together, like soldiers under fire in a foxhole. Instead of growing as solitary cells, the germs can form dense, multi-layered sheets called biofilms. Examples of biofilms are the layers of slime that grow on the inside of water, or the dental plaque on teeth. If the environment is toxic, the cells on the other layer may die. But their dead bodies - and the slime that holds the



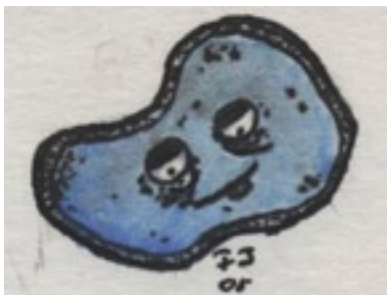
sheet together - protects the ones on the inside. Biofilms are one way that bacteria survive

passage through your acid-filled stomach. The ones on the outside of the clump die, but the ones in the center survive. The pilus used in “bacterial sex” is also used in making biofilms, which brings us to a full circle for explaining the effects of genes turned on or off in space.

But a question arises: Why would bacteria have a mechanism for turning more lethal in space?

The answer is really: they don't. They just seem like they do.

Consider *Deinococcus radiodurans*, a bacterium whose name means “weird ball that resists radiation.” These buggers were found in nuclear reactors and in food blasted with gamma radiation. Why would



this bug have this notable talent? Is it just waiting for us to start a nuclear war so it can take over the

world? Not likely. This bacterium has several copies of its chromosome, and plenty of enzymes to fix the genetic material if it's broken or damaged. It probably has these to survive common earth conditions like being dried out. The radiation-resistance is simply a helpful side-effect.

Similarly, *Salmonella* doesn't have a natural talent for becoming more lethal in space. Rather, the space trip mimics some condition on earth.

The so-called “low-shear” environment of micro-gravity, it turns out, is remarkably similar to the conditions inside a womb. Or among the finger-like micro-villi lining intestinal cells. It is in these environments that the *Salmonella* become virulent, crawling inside the very cells of our intestines, or using biofilms to evade the bacteria-munching cells of our immune systems.

Thus, the increased virulence of these bacteria in space is - despite the histrionics - simply a mimic of conditions that already exist on this planet, inside the bodies we carry around with us every day.

But do not fear, this new finding of deadly *Salmonella* stills has many useful and interesting implications.

Here on earth, the results can teach us more about the low-shear environment of intestinal cells, and possibly help us learn to treat food poisoning.



There are far-future implications. Not only bacterial genes are turned on and off in space. There is a human equivalent to the Hfq protein called the Sm, and this turns certain human genes on and off in space. We've long known about the physiological effects of space travel on the human body - dehydration, loss of muscle and bone, swelling of hands and feet, etc. Now we are learning about the genetics underlying these changes. Many science fiction writers - Blish, Pohl and Bujold to name a few - have suggested physical changes to human bodies to make them more suitable for space and alien environments.

Human expansion into space may require regulation of global changes in gene expression (or



compensation for that in the form of nutritional supplements.)

There are also near-time repercussions for space travel, some of them quite serious. Bacteria grow much more quickly in space than on earth, and to higher concentrations in a given amount of fluid. This means that the food and water supplies on the space shuttle and International Space Station are particularly vulnerable to contamination.

Space travel can also suppress the immune system. Thus, not only are there more bacteria, and they are deadlier, but we were more susceptible to them.

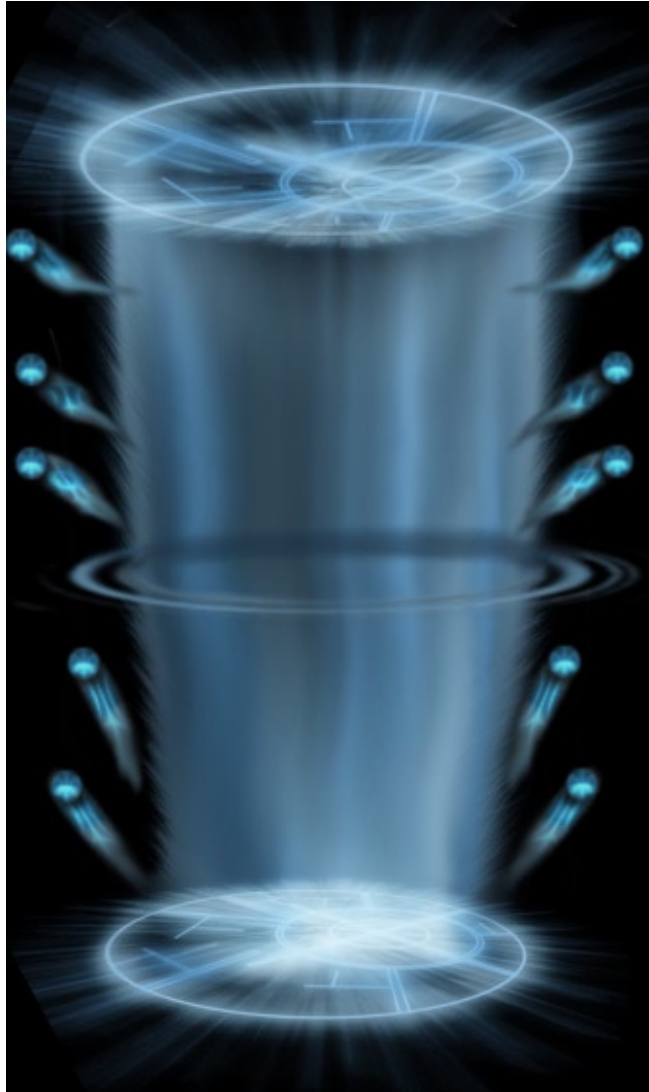
The danger to astronauts may be from the very germs we take with us from earth.

Additional reading:

Wilson et al. "Space flight alters bacterial gene expression and virulence and reveals a role for global regulator Hfq." 2007. Proc. Natl. Acad. Sci. USA 104:16299-16304.

Nickerson et al. "Microbial responses to microgravity and other low-shear environments." 2004. Mic. Mol. Biol. Rev. 68: 345-361.

Wilson et al. "Microarray analysis identifies *Salmonella* genes belonging to the low-shear modeled microgravity regulon." 2002. Proc. Natl. Acad. Sci. USA 99: 13807-13812.



Book Review by Robert Hole, Jr.

Teleportation The Impossible Leap. David Darling. 2005. John Wiley & Sons, New Jersey. ISBN 10-0-471-47095-3.

Teleportation, moving from one

place to another seemingly without going through the intervening space, has been a dream and a trope of mythology, science fiction and fantasy from the beginning. From ancient gods moving their Heros around, to Star Trek's command of "beam me up" (*Hijol* in Klingon), teleportation has been used as a regular literary and plot device.

This book investigates the history of quantum physics leading to the new, growing and very real science of teleportation.

The first three quarters of the book is a good introduction to the development of the background science. Extending from around 1900 to 2004, the history is a fairly lively story. While not as galloping or theatrical as some novels, there are several plot twists and turns. Most of the most well known physicists of the last century are featured (Einstein, Planck, Heisenberg, etc.). Part of the fun in this story is learning how these great names in science had to confront new realities uncovered by attempts to disprove rival theories, or sometimes in proving their own ideas.

The feeling of the cooperative nature of physics and mathematics (and all science) is well presented. There are mentions of the use of the early (1980s) internet to communicate between researchers around the world - in some cases on papers that may

revolutionize the next phase internet. There's even a hint of the possibility of an "Air"-like internet (see "Air: Or, Have Not Have Air: Or, Have Not Have" by Geoff Ryman, 2004).

This is a good introduction to the way science really works. Rivals become friends; friends become rivals and everyone is trying to uncover the truth. Or at least the secrets of the universe.

The author goes on to explain the growing consensus that teleporting something as complex as a human being is now just a technological problem, albeit a huge technical problem. Some scientists believe we won't be able to overcome those difficulties, but the author of course focuses on those that do believe it will happen.

One of the things pointed out repeatedly in the book is that teleportation does not really transport substance, but information. In its essence, teleportation is more like faxing an object than true movement.

The cost of turning matter into energy and back into matter is currently rather prohibitive. Like multiple nuclear weapons explosive force prohibitive (Einstein's little $E=mc^2$ equation may be inconvenient, but continues to appear to be true, changing things from matter to energy and back again is really tough).

Also, the costs in energy

and time of grinding up matter and physically transporting it to a distant location to be reassembled is probably beyond any benefits. To make teleportation cost effective, any object coming out of a teleportation device would of necessity be made from materials local to the receiving end.

There are two basic types of teleportation, quantum teleportation and what the author terms "classic teleportation." Both are already being

accomplished in small (very small) measure.

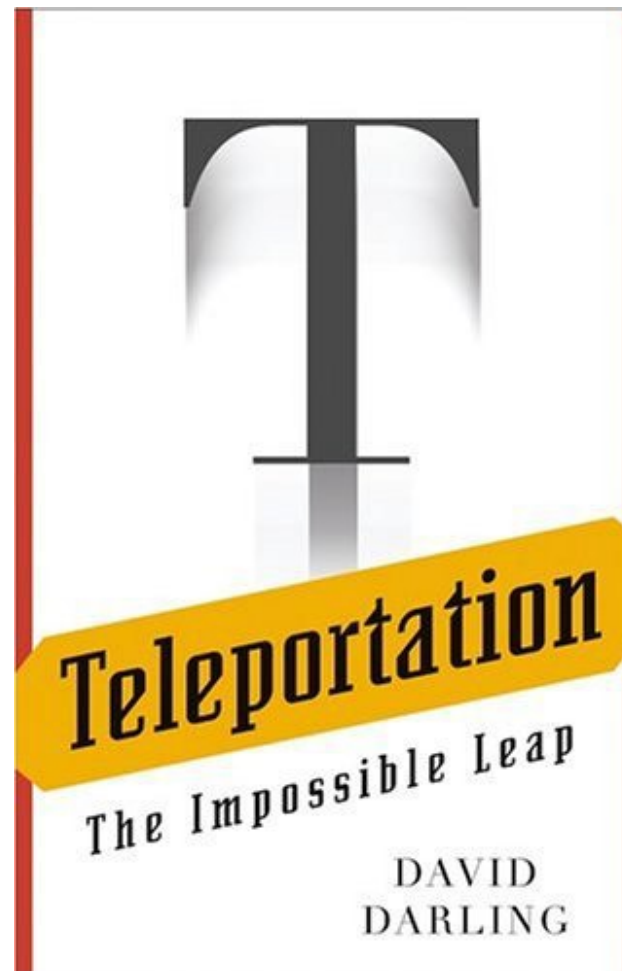
Quantum teleportation is now carried out reasonably regularly in laboratories around the world. This type of teleportation is the focus of the book and likely the most important, as it actually makes classical teleportation more possible.

So far (as of the book's date at least) the largest, most complicated object to be teleported in this manner is a hydrogen atom. Pretty good as a step up from a photon, which was the first thing teleported, but hardly Star Trek (yet).

Quantum teleportation consists of transferring the information about the quantum state (speed, spin and other characteristics) of a "something" to another piece of that same something some distance away. Once this is done, the second photon for all practical and impractical purposes becomes the first something - it cannot be distinguished from the original.

This transfer needs some rather bulky equipment and some pretty good computational skills to make sure it goes off correctly. It also relies on Einstein's "spooky action at a distance" (quantum entanglement).

Further, in order to do the measurements necessary on the quantum level you need to destroy the object you're gathering information about. There's definitely no going back



if you have an incomplete transfer of information.

In order to use quantum teleportation to transfer anything much larger than a quantum particle (photon, electron, etc.), you need to be able to do huge calculations to make sure everything is in place at the end of the process. Teleporting a larger more complicated object, like a microbe, would require more computing power that is currently available on the planet for longer than the solar system will last. It is therefore currently impractical.

Of course there is a new thing on the horizon that might just make it possible to do the calculations necessary in a reasonable amount of time - quantum computing. And, it turns out that, in one of those mildly ironic moments in science, quantum computing depends on quantum teleportation to make it work. So in order to teleport anything of any size or complexity, we may need to invoke teleportation.

The author calls the other form of teleportation "classic teleportation". This is primarily because it relies more on classic physics than quantum physics.

It also requires much less precision and to some extent also exists already. All that is needed in classic teleportation is a pretty good copy - you don't need to know the

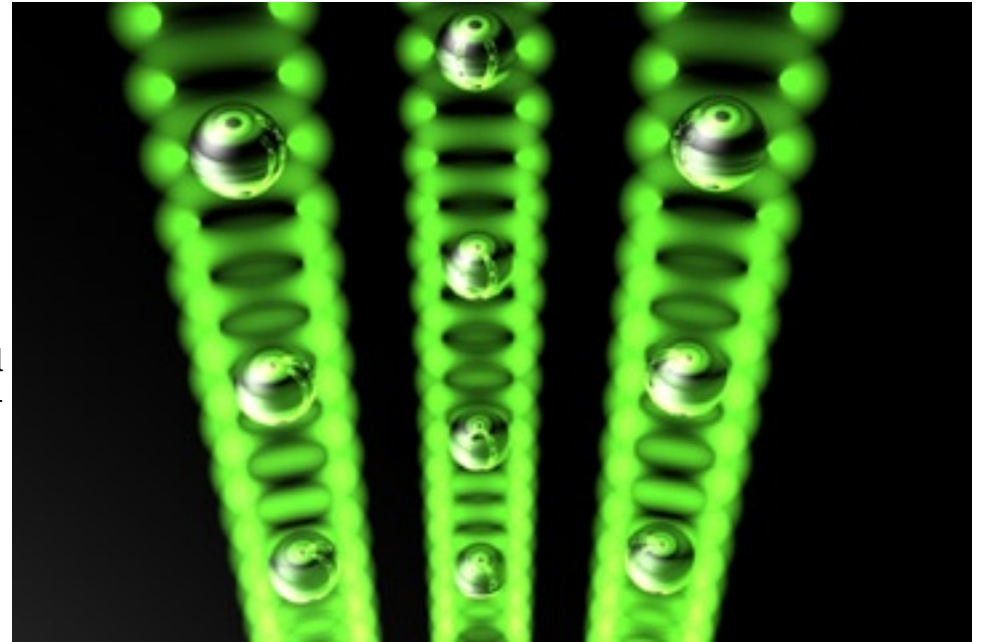
exact quantum state of each particle. And because you only need an approximate copy you don't necessarily need to destroy the original. This could result in Star Trek-like replicator technology.

At a crude level, we do this already, all the

time. Remember, because of the costs of transporting the matter itself, teleportation involves the movement of information rather than substance. Faxing is essentially a crude form of classic teleportation.

We already use three-dimensional printers and other manufacturing technologies to replicate items around the world. We make (or design through the computer) an object and send it off to be reconstructed at a remote location using materials local to the far end. We just aren't doing it at the molecular level quite yet. Unless you count transporting chemical formulas.

In many ways, for the science fiction enthusiast, the best parts of the book are the final chapters. There is a very interesting discussion of the



ethics of the teleportation of humans.

Because information is all that's actually moved between the two locations in these types of teleportation, there inevitably arises the question of whether the copy at the other end is actually the original. It is not the same material, and (in quantum teleportation) the original was ground up in some manner to get the information to send to the far location.

And if what (or who) comes out at the far end is considered for ethical and legal purposes the original, how close a copy does it need to be to be considered a continuation of the original? Is classical teleportation enough - or does it need to be quantum teleportation.

Since in classic teleportation

you may not actually need to destroy the original, if the original is killed (to prevent the machine just making copies), is that murder? Or is it murder only if a copy doesn't properly come out the other end? And what happens if you don't destroy the original? Who, or what, status does the copy have?

And if there is something beyond physicality that defines individuality (call it a soul or whatever), would that move with the copy? Can it be broken down to an information state that can be sent? And how could you prove it? Which religions would say what about those teleported individuals?

The author doesn't come up with any solutions. But the questions posed are thought provoking and like the recent cloning and stem cell debates, it's not likely to be easily answered.

These questions also make (and have made) good fodder for science fiction tales. James Patrick Kelly covers some of them really well in "Think Like a Dinosaur" (available at <http://www.nonfictionwise.com/ebooks/eBook57.htm> among other places)

In a final timeline, the author suggests that human teleportation may be possible by the end of this century which means we might want to start the debate on these issues now. Genre writers might be just the ones to open the dialog. This book is an excellent source for the background for making that opening.



When Sciences Calls
by
SaBean MoreL

I never studied. Sometimes I'd cheat, sometimes I'd work like hell to fake the facts and sometimes I just let myself fail. School sucked for me and to this day all I remember is a haze of shooting up and washing down the bile with high doses of remorse and self-pity followed by extended periods of shit and agony. I quit school with 4 classes left towards a degree in English Lit and a list of sources for anything I might need. I won't lie, I slept with

a couple of profs to get through, but mostly I slid work off to friends and those who needed a touch of something to keep them going.

I did take part in one miracle of scientific study. I was a guinea pig for a girl with a wish to make history. Her name was Dr. Sarah Cloveen, the daughter of an old race car driver and the wife of an 80-something chemist who set her up better than any grant ever could. It was the love story of the ages: he was a widower six times and she was working as a waitress when he took her under his wing and then his weight in exchange for college money. A couple of degrees and a shitload of affairs later and she had what she needed for her first major solo project. She was a computer scientist whose primary interest was AI. She had done a lot of work in pattern recognition and had even managed to get a simple spoken translation system to work at nearly 30% accuracy. She bragged about that. I met her through an ad she placed while I was living in Texas.

Wanted: Brains. Research into brain functions and artificial intelligence.

I'm not kidding. That was the head line on her little flier posted up in a coffee shop where I spent my afternoons. It had a university number and mentioned money. I had money, probably enough to keep me going for a few years, but I wanted more. Extra

money meant extra fun weekends without having to worry about rent. I called and she invited me over to her lab, or the downstairs den of her husband's mansion.

And some den it was. When her maid, an honest to god Mexican maid, walked me in, she was standing in the doorway looking in at the madness. There was a giant computer along one wall. It was ten feet high with wires all over the place. There were wires everywhere and stools and benches and monitors. She turned around and shook my hand, took me by the elbow into the room. Without her guiding me, I never would have known which path through the chaos to take to the little stool by one of the benches.

She started shaving spots in my hair. I had been in the seat for less than ten seconds when the sound of the automatic clippers began. I don't know why I didn't jump up and run out of there, but I didn't. I did have half of my head shaved anyhow, so I guess it wouldn't have done much harm. She hadn't spoken to me any more than to tell me her name, but in less than two minutes, I was having suction cups put onto my head. She then ran wires to a cart with wires that ran to a large metal box on rollers that connected to a computer on the bench. She stood in front of me after everything was connected.

"I'm going to say some things to



you and then I'll do some things to you and then I'll leave and you'll do some things yourself and then we'll look at the results. How's that sound?" she was cheerful the entire way through. I was completely OK with everything. I had shot-up about two hours before, so I wasn't that messed up, but she made me feel calm.

"How much money did I tell you I'd pay you?" She said, very gently.

"Five hundred dollars." I answered.

"Well, we'll make it two thousand, how's that sound?" She answered.

"That's fuckin' great." I said.

She looked at the computer.

"Oh, I'm sorry, all we can do is twenty bucks." She said in a voice of a bored housewife.

"Then I'm leaving." I said, completely without moving.

"No, don't worry, you'll get five hundred dollars today before you

leave this lab. In fact, I'll put it on this table." she said and laid a large wad of twenties on the table to my left. She never took her eyes off of the computer.

She asked more strange questions. *Do you have to go to the bathroom? Are you on your period? Is there a fly in here? What's the time?* The whole thing felt like some fucked-up episode of *The Prisoner*. I answered these questions for an hour and she never said anything unless she was following up with something that completely disagreed with the previous statement. It was strange.

Dr. Sarah stopped talking and walked over to the computer. She was staring at some particular portion of the screen and typed for a minute or so. She said nothing. I wanted to get up, but I knew this was just the beginning and figured it would hurt to pull the electrodes off. She came over to me and pulled off the wires that led to the suction cups.

"I'm going to start touching you on various parts of your body. If you wouldn't mind getting undressed, I'll be back with some water and a light snack."

I was not expecting to get naked, but that's never been much of a problem for me. I dropped my clothes and made sure I still had my gear stowed in the side pocket of my cargo pants. I wanted to shoot up again, but she came back sooner than I expected

with a tray. She brought me a glass of orange juice, a slice of pepperoni pizza and grapes. She wired me back up and let me eat in silence. Then she stood in front of me with a pencil turned around so the eraser was facing me. I was naked, eating pizza wired to some series of machines with a woman standing over me with a pencil. I can see exactly how fucking surreal this was now.

“I’m going to touch you with various things and measure your responses. If you’re uncomfortable, just say so and we’ll go on to the next one.” Her voice was very soothing.

She started by pushing the

eraser into various parts of my body. My face, my neck, my tits, my sides and even my clit. It was weird and I could tell that she was watching the monitor and was reacting with slight surprise to the numbers. She then put down the pencil and picked up an empty glass and repeated the entire process. Then with a fuzzy piece of fabric on a stick. Then with a piece of metal that she would dip into a glass of hot water so it was nearly hot enough to scar. I jumped, but never said stop.

After an hour, she started using her hands,

starting with her fingers. It was strange because it didn’t feel like she was touching me. It felt like she was touching some piece of experimental meat. After a few passes of varying degrees of roughness, she pulled up a large recliner and pulled the machine over next to it.

“Now, we’re at the last portion. You have a seat and I’ll get the materials.” She patted the seat like a Grandfather inviting me into the front seat. I sat down and she pulled up a tray on wheels. No shit, there were six or seven vibrators on it ranging from pinky size to forearm.

“Now, I’ll leave and what I

want you to do is pleasure yourself with these, one at a time, internally and externally. Go at your own pace, but please don’t stop for at least 10 minutes on each so that we can gather as much of a sample as possible.” she said making sure the computer was working.

Even I knew there was some weird shit going on.

“What are you studying?” I asked.

“It’s a study at how brainwave activity in 7 locations is effected by differnt sensory stimulus. You’re auditory and sexual. Please, I want to get this over with in the next couple

of hours. I’ll leave, so just go through the pieces and tell me when you’re finished.” She said, not at all comforting me.

I waited a minute and then went to work. I started small and went bigger. I wasn’t really into it much, but it was getting better and better as time went by. I thought I was spent by vibe five, but I powered through and actually managed to enjoy the last one. The stepping-up theory seemed to work. I think at one point the good doctor entered the room when I was screaming, thinking I was finished. Well, I was for the moment. I stood up, careful



not to catch the wires, and got dressed. I was fully clothes when I called her in.

“I hope it wasn’t all work for you.” She said, a funny little giggle in her voice.

“It was weird.” I said, finally able to see exactly how strange it was and realizing that it was that strangeness that had made the last section so much fun.

She went to the computer and looked over the numbers, slid in an old floppy disk and then filed it in a small cabinet.

“Would you like to stay and have some real dinner? I’m sure you’ve got questions and I’m certain you could use something to eat.” She was inviting.

I took her offer and joined her and her semi-comatose husband at the dinner table and she told me her story while we enjoyed some fish that still had the head intact. I left that night feeling like I was first violated and then allowed to violate myself, but at the same time, wasn’t that what I did everytime I shot up? I went home and slept for a full day.

I only heard from her one more time, a few months later when she sent me a paper that explained the process of investigations and how she had discovered sexual excitement occurs in exactly the part of the brain that they expected it to. No surprises in the study, but I enjoyed the test.



The first science that interested me beyond what the teacher assigned was particle physics. That’s a big thing for a kid who was something like 10. I found a book in the library that explained a bunch of the theories behind PP and did so in kids vocabulary. It explained electrons and how they did their work and even got into something resembling quantum theory.

After that, I fell in love with set direction. I loved dioramas and everything and I started watching old movies that you could buy for a dollar on VHS tapes. One of those was Frankenstein and another was The Cabinet of Dr. Caligari. That showed the laboratory to be a magical thing. You can put anything in there and with the right lighting, it looks amazing. When I dressed the lab set



I gave up and declared that I'd never try to be a writer again (and I'm still holding that true!) I studied up on biology and physics and computer science. That last one was the hardest. Though I spend my days surrounded by computers, I have only a faint idea what

for The Chick Magnet, I pulled out oscilloscopes and a few pieces of punch card equipment and had Ryan light them with hard blues and a slash of green. The scope's repeating trace was simple, but I couldn't figure out how to get a nice wave going so it had to be what it was for that shot. You saw the pieces in the final print, but you really only got the feel of it when you were standing in the room looking at it. That was my best piece of set direction ever and I don't think I'll ever top it unless I get a serious budget.

But I sure as hell want to try!

After set-dressing, I became interested in writing and a part of writing science fiction, or even fantasy, is to get the science right-ish. Before

goes on beyond the hardware. I have almost no understanding of software or engineering or what have you, but I know the history. I tried to get learned on all of that, but I failed. Most of it was way over my head. I can talk computer science, better on the hardware side than software (because in the end, isn't that all just ones and zeroes?) and I can go into some theoretical physics and the like as well. What I really do get is granulated particle behavior. Since granulated stuff behaves neither like a solid or a liquid (and in many ways behaves like both), it's got a whole new field of study dedicated to it. That I understand!

So, I'm no scientist, but what I wouldn't give to lab sets!



Fannish Memory Syndrome

Steve Green

Into Solihull, for our town's ninth annual beer festival. It's been organised by the local branch of the Campaign for Real Ale, the pressure group launched back in 1971 to protect what remained of the independent British brewing industry from the so-called "Big Six", which by then had swallowed up eighty per cent of UK beer production and more than half of the pubs.

Needless to say, CAMRA's had its share both of victories and defeats over the past three-and-a-half decades, but the fact that our 2007 showcase has more than thirty ales and ciders on tap (plus one perry) indicates the public's growing thirst for an alternative to the standard fizzy concoctions pumped out at high street bars.

The festival is also commemorating the branch's twenty-fifth birthday with the launch of Solihull Silver Shield,

brewed especially for the occasion by North Warwickshire independent Tunnel. Several members had a hand in the brewing process, among them my old *Critical Wave* colleague Kevin Clarke, who's more than slightly chuffed to have been asked to design the label for the bottled version. (Kevin is also responsible for pressganging me last year into providing a pseudonymous CAMRA column for *The Solihull Times*, but I manage to resist the temptation to lamp him with one of his own bottles.)

The event proves a huge success, although I'd rather all thirty-three casks hadn't been drained a full two hours ahead of schedule. Fortunately, I'm discretely tipped off that a crate of Silver Shield has been discovered under one of the tables, so we're properly able to celebrate the news that it's been voted "best of festival".

And thence to Oxford, in order that Ann can make another pilgrimage to the Eagle and Child, the 17th Century hostelry known locally as the Bird and Baby. Between 1939 and 1962, it was also the weekly meeting place for the legendary writers' group the Inklings, which members included such luminaries as J R R Tolkien, C S Lewis, Roger Lancelyn Green and Hugo Dyson (the last reputed to have interrupted one of Tolkien's readings from work-in-progress *The Lord of the Rings* with a cry of "Oh no! Not another fucking elf!").

Between visits, we drop by the bizarre Pitt Rivers Museum. Founded in 1884 from the multifold collections of archaeologist and ethnologist General Augustus Pitt Rivers, it's a bewilderingly diverse stumble through the esoteria of human achievement. Body piercing, religious talismans, model boats, shrunken heads, homemade bongos, prehistoric weaponry, phallic statuettes; all of life – and quite a lot of death – is here, laid out like a wooden maze constructed from display cabinets. I wonder if they'd be interested in an exhibition of hand-crafted science fiction fanzines?



**Letter-Graded Mail
sent to garcia@computerhistory.org
by my loyal readers**

Hi Chris,
James Bacon's defence of the world sf convention as a showcase for TAFF is undoubtedly sincere, but somewhat of an over-reaction to my assertion that delegates might enjoy a higher profile at smaller gatherings. This is not the same as "knocking" worldcons or those who work on them, James, but a simple acknowledgement that an event attended by 500-1000 fans is likely to have a sharper focus than one with a turnout ten times larger, especially if the latter is spread across several venues. I'm delighted to hear you had such a good time in 2004, and had so many opportunities to promote TAFF, but I can assure you this is not always the case.

Honestly, I don't remember seeing anything of the TAFF delegate at the 2002 WorldCon, but that may have had more to do with me not paying attention.

Claire Brialey's feedback is much meatier, and leaves much to chew over. I believe the logistical hurdles raised by candidates choosing their destination could be solved if the desire was there, but strongly suspect fannish inertia will win the day. As for parallel fan funds, I'm not convinced there's a large enough pool of spare

cash for campaigns such as JETS to become regular events. Doesn't mean we shouldn't give it a go, though.

Cheers

-- Steve

Claire brought up a lot of stuff that I never considered in her LoC. She's way smarter than I am! I know it'd be hard for me to support too many fan funds at once, but I think they could probably work on a system like The CorFlu 50 and get people to where they want to be. BBB and Get Harry went pretty well, as did John Hertz to Japan from what I hear.

Thanks, Steve! And now...Lloyd Penney!!!

Dear Chris:

Four issues I am behind with the Drink Tank I am...I am beat. I'm trying to catch up with fanzines, and also have my evening job, and my new daytime job! I am a full-time editorial specialist in the ePublications department at the Canadian National Institute for the Blind, or CNIB. That leaves little time for sleep... I have issues 143, 144 and 145, and 146 arrived today, I think. I will try to get this to you before we leave tomorrow for Montreal to attend the annual con in Montreal, and go to the first post-Japan Anticipation meeting.

You know, I'm so psyched for Anticipation it's not even funny. I



hope your new job is treating you right. It's always tough starting the new gig, isn't it?

143...America isn't the only country losing their troops overseas. Britain has lost hundred in Iraq, and Canada has lost at last count 71 troops in Afghanistan. We get our share of IEDs. Years ago, I saw an Australian political cartoon about immigration. A friendly Australian with an Australian flag welcomes a boatload of immigrants, and the first man off the boat demands that the Aussie removed his flag, for it offends his eyes. Aussies find immigrants unfriendly and demanding, immigrants find Australians unbending and hostile...who in this situation is the racist? Sigh...the whole topic is just uncomfortable for all. Racism itself is not used racially, for it is employed

equally by all against all, no matter their creed or colour.

That last is a good, and terribly sad, point.

When I go to Montreal for the Anticipation meeting, I'm going to offer to run their fanzine lounge. I still have all the paperwork from the Winnipeg lounge, but we won't need it much, seeing how many zines are now electronic, unless some would like to print their zines up for reading or selling in the lounge.

You know I'm going to be bringing a boatload of my zines for the Lounge. I'll be happy to help ya out at con too. I loves me a good fanzine lounge!

144...Yeah, Chris you got us all hot and bothered over racism, when there are many other things we'd rather be hot and bothered about...like a lot of those great illos further into the issue. Frank Wu should know that wuss that I am, I think jellied chicken feet are about the grossest thing I've ever found on my plate. And no, I did not eat it. Frank would also like my chicken Caesar salad...two kinds of lettuce, chicken chunks, chopped hard-boiled egg, turkey bacon bits, croutons, fresh grated Parmesan cheese, and light Caesar dressing with anchovy paste mixed in. Getting hungry again...

MMMMmmm...Foodstuffs!

Both Yvonne and I voted for TAFF! And we voted for Chris! Which

Chris? Guess...

I'm sure all the Chrises Thank You for Voting. And you reading this...have YOU voted yet?

I've already seen the fallout of people involved with Second Life... they're so busy with Second Life, they seem to be having problems dealing with their first one. Priorities, people... Yvonne purchased some Soviet kitsch from a Russian fan at Worldcon many years ago now. Various KGB lapel pins, little portraits of Lenin and Marx, and an official KGB identification card, giving identification number 007. Ah, little treasures you find at cons...

I bought my KGB flask at WorldCon, which was awesome (Even though it opened in my suitcase at BayCon) I've started in on Second Life, but I haven't really taken it to heart like many have. I gotta look into their Furry Communities since I'm programming a Second Life panel at Further Confusion.

The anonymity of the Internet is a fine idea, but not when people behind that shield to spew hatred, insult others and generally hide behind Mommy's legs so they can sass others with so-called impunity. If only the shield could be lifted judiciously to get those who think they can hide, but then so many other abuses could then happen.

On the internet, nobody knows you're a dog.

Hey, John! 150 locs so far this year? Excellent! I'm at about 190, and heading for another 225+ year.

Greetings to milady Linda! Milady, dost thou have a tribble on thine left shoulder? He's from the brute squad! (He IS the brute squad! We care enough to send the hairy beast.)

I don't keep track. I'm not a real LetterHack! I should hang my head in shame!

145...Just east of the centre of Toronto on what's called the Danforth is a great little shop called Gifts from the Earth, a small gem shop with the kind of small beauties Spring speaks of in

her article. Much of what's there is priced out of my range, and unfortunately, if we did buy anything there, it would collect dust at home, but these items are beautiful to see. The kind of gem to whet your apatite? (Duck!)

Even with my status as a certified diamond trader, I still can't afford any gems!

Hey, John! If I could write locs in my sleep, I'd have a lot more free time on my hands. I'd also

wonder why there's so many typos in those locs. I sometimes wish I could do my work at work in my sleep. I'd be refreshed and caught up.

I only proof-read in my sleep. I think that shows.

I will say something controversial and IMHO, a perfect solution to many of our overfishing, food, climate, etc. problems. Our problems would be on their way to being solved if there just weren't so many of us. The Earth cannot support our numbers now, and certainly not in the future. Birth control for an extended period of time would reduce the pressure we put on

the air, water, ground and bounty of the Earth. We have gone forth, been fruitful and multiplied, and I'd say the Earth is just about full. It's to the point we are an infestation on the land, and when we spoil the world's ability to feed us, and give us fresh water and air, our numbers will drop, in drastic number, I fear.

Overpopulation is tough (and the upper limit for supportable life on Earth is supposedly



around 12 billion humans, though that's with considerable restrictions on certain activities. China's still growing despite all the attempts at limiting numbers. India is growing incredibly fast as well. It's a rough thing that will hurt us all.

Hey, Frank, don't do what so many Americans do, and blame Canada for all the ice and show the northern US gets. Where do we get it from? Alaska... Winters aren't miserable, you just have to know what to do in it. John Purcell knows that very well as well, seeing the time he put in around Minneapolis. Include the Toronto Maple Leafs in that bunch of lovable losers. It's been 40 years this season since the Leafs, or the Laffs, as some call them, won the hallowed Stanley Cup.

The Leafs! How could I forget my third favourite hockey team! And winter means blankets and I love blankets!

146 to finish up here... We're having calamari, lots and lots of calamari, calamari's fun to eat, calamari's really neat, hurray...for calamari!, not made by Chef Boy-ar-dee... For the record, I'm at 190 locs for the year and chugging away as best as I can. Love the photos from Silicon. Dare I ask what liquids go into a Drink Tank in a glass?

It's Ginger Beer, a splash of bitters

and Rye Whiskey. It's good stuff and it must never be served in a glass. Only in one of those Red Plastic cups with the white interior. They just make things taste better!

I had good news about me earlier...and now for Yvonne's good news. She has a new job as well, temp to perm, at Diageo Canada. Diageo is the worldwide distributor for Tanqueray Gin, Johnny Walker, Bailey's Irish Cream and other powerful beverages. Another good thing is that the offices for Diageo Canada are a ten-minute walk north of our place. We are now both fully employed. Will miracles never cease?

I will wind up here, because we're gone to Montreal around noon, and I need my sleep. Ni-night...zzzzz...

Yours, Lloyd Penney.

Fantastic for Yvonne! I love me some Johnny Walker (Blue is a fave, but Red is usually what I stick with). It's all looking up for the Penneys...and not just because y'all are slightly shorter than me! I shall support her by buying and serving more of her company's liquors at parties. That's the type of support I can get behind. I hope Montreal was a good thing and I can't wait to see what you folks come up with to make Anticipation the Best Damn Canadian WorldCon ever!



OK, so that's another issue of The Drink Tank. There'll be at least two more issues before The Corset Issue and then it's straight on towards New Year. I gotta start working on the Annual Index. Every year I do it and every year it gets less useful!

Art for Fannish Memory Syndrome was Solihull Beer Festival logo by Kevin Clarke as well as The Eagle & Child, Oxford sign at the end of the article.

The Cover was from Jack Moreau and is a fun little piece. The Mad Scientist Intern is from King Cheetah and I think she's the hottest woman I ever did see. Ian Taos gave us those four kooky germs on the same page and Chris Hunter did all those little lgerms. He's an aspiring SF writer!

The Dapper Scientist photo is from Morgana and she's a brilliant photographer! Pat Reiley gave us Lisa from Weird Science (named after the Apple Lisa computer and one of the few movie appearances of that machine) and the photo called Weird Science with the wild haired scientist lass is from Andy Farrinton. I love that piece!

The teleportation pieces were from Abby O'Byrne and Adrienne Rothchild. Those two really fit in I thought.

Neter G, Jada Fitch and PinkSaba were the folks who gave me the pieces with the LoCs. I had to keep the cephalopods in this issue, didn't I?



Laboratory by Jada Fitch (www.jadafitch.com)

Hey! HEY!!! You should vote in TAFF! TAFF, the TransAtlantic Fan Fund! Go to <http://taff.org.uk/> and print out the ballot, make your donation and vote, damn you! It's the right thing to do!