OBLIQUE PERSPECTIVE

Brave New Worlds
Is Fringe Technology Becoming a New-Age Religion?

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Do you believe in fairies? —Peter Pan

Mainstream conferences like ISSCC, Hot Chips, and Comdex can get dull after a while. Far more exciting are the conferences devoted to emerging "fringe" technologies such as Artificial Life, Virtual Reality, and Nanotechnology. While the disciplines on which they're based vary widely, other aspects of these conferences are surprisingly similar. I suspect this has more to do with the basic wants and needs of the attendees than with the subject matter they discuss.

The More Technology Changes...

The technologies represented by today's conference circuit could hardly be more different. There's the field of Artificial Life (A-Life), an effort to understand the processes by which living organisms grow and evolve, in the hopes of creating self-organizing systems in ways that overcome the limitations inherent in today's human-engineered designs. There's Virtual Reality (VR), an effort to boost man–machine bandwidth by integrating sight, sound, and other senses with a collection of novel input devices.

There's the Hackers' Conference, a gathering of free spirits who enjoy exploring the limits of software and other systems, with healthy side discussions of cryptosecurity (better living through mathematics), the L5 Society (civilian efforts to colonize space), Project Xanadu (all the world's a database), and cryonic life extension (putting the dead in cold storage until cures are developed for what ails them).

And now there's Nanotechnology, a new field of "theoretical engineering" devoted to the design and construction of marvelous new molecular structures by assembling atoms in preordained ways. Remember the colored wooden balls you plugged together in freshman chemistry to build models of simple molecules? Nanotechnologists hope to do the same thing on a far grander scale, using real individual atoms. With sufficiently complex structures, they've determined, one could build superstrong materials, submicroscopic lever-and-cam-shaft supercomputers, intravenous robots, and even home matter-copier machines.

On the surface, these far-flung technologies would seem not to overlap. Rarely do rocket scientists co-major in biotech. But despite their difference in subject, the conferences do have much in common.

One similarity involves conference make-up. Attendees generally come in the same three flavors. There are the Gurus—conference organizers, visionaries, and others who performed the seminal research. There are Groupies—disciples gung-ho on each field, eager to learn from the masters. And there are Scribes—authors and reporters trying to keep abreast of the latest trends in popular technology.

Curiously, the same people often show up at one fringe-technology conference after another. Like a band of new-age Dead Heads, the same faces can be spotted at *A-Life* in Santa Fe, *Hackers* in Tahoe, *VR Cyberthons* in San Francisco, and at the *First General Conference on Nanotechnology*, held last month in Palo Alto.

Modern-Day Rorschachs

A second trend involves attendee perspective. While the gurus generally seem to understand the limitations of their work and focus on problems most immediately at hand, their groupies seem eager to leap beyond the details and focus instead on how each technology will affect society. And like psychiatric patients projecting their own subconscious onto ink blots, the benefits foreseen by each groupie can be amusingly self-serving.

One of the true visionaries of VR likes to point out that cyberspace could be used to let people experience the sensations of walking with three legs, if they wanted to, or the joy of sprouting dragonfly wings and flitting over a meadow. Probably so—*if* they wanted to.

Cryonic suspensionists seem most caught up in the idea of *them* living forever, or *you* living forever. The benefits of everyone *else* living forever are less clear.

And nanotechnology has opened a floodgate of self-involved dreams. At last month's conference it was said that wind-surfing boards built with nanotech materials could be larger, faster, and more maneuverable than any that exist today. Might the proponents of this idea wind-surf, perchance? One attendee proposed building guitars from materials that would reconfigure their internal structure automatically for every song played, in order to produce the most resonant sound quality possible. I've never heard this fellow perform, but I doubt if the biggest limitation to his musical skill is the state of material science.

An artist who works in fabric was intrigued that weaving her work using diamond-based fibers might let it last for all eternity. One young man opined that nanotechnology would let him build unique gemstones from custom molecular recipes. "Wouldn't your fiancée rather

get a one-of-a-kind, hand-made engagement ring," he asked a friend, "instead of one made from a little chunk of [diamond] rock?" I doubt it. Unless she's really special, I'd suggest he stick with the rock.

And an L5 Society member described how super-strong nanotech cables could be used to hoist people cheaply into geosynchronous orbit; imagine a cosmic, thirteen-million-story elevator. Once aloft, spaceships hung from nano-thin sails could carry them among the planets using just the force of the solar wind.

Willing Suspension of Disbelief

A third trend among technogroupies may be a willingness to take a bit too much on faith. Mainstream doctors doubt whether the fresh-frozen corpses and disembodied heads now sitting on ice somewhere will *ever* be thawed out and revived—yet true believers are quite literally betting their futures that they will. One nanozealot suggested using molecular machines to build panels of material that would "repel gravity"; another thought sufficiently fast computers would let us build machines to travel in time. Far be it from these free thinkers to let laws of physics stand in their way.

But what of the more conventional ideas? Suppose it *were* somehow possible to link atoms together like Tinkertoy pushrods, gears, and camshafts: would they *truly* behave like the animated graphics simulations? Would diamond fibers *truly* be as strong as the gurus say? Apparently so, if today's theories of atomic physics are correct, though empirical proof does not yet exist.

The reason most people don't believe nanotech is real, one of the speakers explained, is that they're just not willing to believe that assemblies of individual atoms would behave like tiny Tinkertoys: "First you have to think of atoms as [physical] objects," she said, "for any of these other things to work." Proof of a hypothesis via presupposition of results! Peter Pan couldn't have put it better: first you have to believe in fairies, in order for Tinkerbell to get well.

Do I "believe" in nanotech? Frankly, I haven't the background, time, or inclination to judge whether its theoretical underpinnings are valid. Its leaders are far brighter, more imaginative, and better educated than I, and head-guru Eric Drexler seems to be a thoroughly credible, level-headed fellow, so I'm willing to accept that his claims are consistent with modern scientific theory. On the other hand, I find it hard to dismiss the fact that other mainstream scientists have their doubts.

But the issue shouldn't be "belief" vs. "disbelief"; proof that a hypothesis is valid should eventually rest on reproducible empirical results. Alas, the more radical a new technology, the more elusive its empirical proof. Once the first frozen mouse has been revived, and once nanotech methods have been used to assemble even one stable molecule, no matter how trivial, their cases will certainly be bolstered. Until then, though, a certain amount of skepticism should be expected, and may even be healthy. Disagreement among researchers should be discussed and resolved, not discounted out of hand.

...and Some Common Big Themes

Finally, just under the surface, fringe technologies often reveal themes that reflect the most basic of human concerns. These are Big Themes indeed, themes like escapism, rebirth, immortality, and paradise.

By living in immaterial worlds, VR practitioners can escape to their own private visions of cyberspace nirvana. Cryonics promises a quite literal escape from these mortal coils, plus rebirth and immortality, all thanks to the medical advances of a presumably utopian future. The L5 Society seeks an escape to the cosmos, ensuring the ultimate immortality of all Earthbound species. If only we knew how the mind worked, a well-known A-Lifer says, we could someday extract the entire connective structure and synaptic memory of a human brain, and transfer it to a computer: immortality through software simulation.

And if nanotechnology seems to attract more than its share of followers, maybe that's because it pulls all the Big Themes into one unified theory. It lets us escape both vicariously to inner nanospace and externally to the cosmos. It fights mortality via better medicines and by deploying swarms of autonomous nanorobots within the bloodstream, able (take your pick) to seek out and destroy viruses and cancer cells, fix genetic mutations, extract intracranial software, or repair the physical carnage done to body tissues during cryonic freezing and defrosting. And future nanotech worlds would be resource rich, energy efficient, and pollution free.

Peace be With You

But maybe I'm being ungracious here. Perhaps I'm missing the big picture. Escape, rebirth, immortality, and paradise aren't new ideas, of course. They've been around since the dawn of man, in the form of myth, metaphysics, and religion. Clearly a belief in forces stronger than us helps satisfy some basic human need.

But it was a whole lot easier to believe in religion in simpler, pretechnological times. Engineers are now trained to believe only in that which they can objectively prove. Mainstream religion is thus suspect, while Science and its offshoots are deemed Real. Maybe the willingness to accept Fringe Technology into their lives is what gives true technogroupies inner peace.

As we approach the holiday season and the start of a new year, perhaps it's time to adopt a more open-minded sense of spirituality. What difference does it make what religion, god, or technology an engineer chooses to worship? If Fringe Technology *didn't* exist, it might be necessary for Man to invent it. ♦