

Living in a Wireless World: We've been hearing for years about a future when we and our machines are all connected--without wires. Finally, the pieces are coming together. And family life won't be the same.

by Steven Levy

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Is it finally time for the much-touted Wireless Big Bang, when all our devices, appliances and gadgets suddenly meld into a big goo of connectedness, and everything and everybody is in touch with each other instantly and persistently? American families can breathe a sigh of relief, because the answer is no. We have yet to endure the Jetsonian vision of Internet refrigerators that sound the alarm when the milk is low. We do not currently receive instant messages from the Pottery Barn after lingering at the store window for 40 seconds ("If you walk in now, that leather ottoman in your field of vision is 10 percent off..."). And we have yet to tally up the considerable bills or contemplate the loss of privacy that being always on, all the time, will entail.

On the other hand, there is a lot to look forward to when the wireless experience arrives en toto. And come it will: the future is only a few years behind schedule. In fact, components of the untethered world have been quietly appearing, piece by piece. Wireless broadband networks are already in place so that patrons of Starbucks and airport road warriors can access the Internet while they sip or stew. Satellite-connected cars are scolding drivers for missing a left turn. Millions of families have resolved the nightly fights for the broadband connection with wireless home networks like Apple's popular \$300 AirPort Base Station. Now they can stroll around the house with laptops, lounge on decks and in living rooms, while devouring the Internet at breakneck speed. And families everywhere have learned that mobile phones or two-way pagers are great stress reducers--a kid's quick "I'm OK" message tops a Xanax any time.

This is just a taste of what will happen when we become cybernomads, roaming the sometimes cruel terrain of the 21st century with wireless devices as our constant companions, and not missing a trick. Many of the frustrations of modern life will be resolved, like getting a printer to work with your camera, or making sure that the person you're trying to urgently reach is indeed within your reach. Stray moments of downtime--waiting in line for your latte or riding the subway--will soon be opportunities to catch up on e-mail, update your stock portfolio or join a

foursome for bridge. "With a wireless device you can do these things because it's on your person," says Joe Sipher, a vice president of PDA-maker Handspring. Do you want to do those things? Those developing the technologies are utterly convinced you will. "Remember a few years ago when people asked whether mobile phones will take off, because you can get what you want from land-based phones? Now you can't handle your life without one," says Maria Khorsand, president of Ericsson Technology Licensing. "It will be the same for other forms of wireless, which is really suited for our lifestyle--simplifying it, making it more fun." So expect the already crowded radio spectrum that accommodates wireless communications to be jammed more tightly than a Volkswagen at a clown convention, as the air around us fills with data. No wonder MIT calls its experimental wireless initiative "Oxygen."

But will it be nourishing or toxic? That depends, in large part, on us. "When we look at something like the wireless revolution, we have to think of it not as a revolution in technology but sociology," says Robert Blinkoff, an anthropologist who has studied the wireless experience around the globe. The good news is that sociology, and not just marketing, will determine just how the wireless world unfolds. Interestingly, consumers in countries like Japan and Finland have already begun to establish their own style in relating to it. While it is often observed that the Japanese have rapidly taken to using mobile phones to connect to the Internet, perhaps more significant is that young people in Japan see their phone devices not as tools but companions. They personalize them with exotic ring tones and distinctive images for the tiny color screens. In the United States, however, wireless use to date has focused mostly on two things: business productivity and security. The former explains why one of the most talked about wireless devices is the RIM (Research in Motion) company's BlackBerry, a basic box with a thumb keyboard that reliably handles e-mail. As for security, the value of going mobile was reaffirmed in the wake of September 11. In New York City, Mike Daisey, a writer who'd just happened into a Starbucks in the financial district, opened up his laptop and instantly connected with the wireless net it offers. He described the devastation and e-mailed it to a list of 5,000 correspondents.

As wireless moves to ubiquity, it will wind itself deeper into the fabric of our lives, sometimes with uncertain consequences. Take instant messaging. Even in its computer-based form it can be addictive. But what if it

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were always available, allowing for a constantly running dialogue between two best friends, or mates, or parent and child? What would be the ground rules for keeping it going, turning it off? "The great thing and the bad thing about wireless is that you're always in contact and always on," says Palm exec David Nagel. "Sometimes you need to get away from your family."

Another problem deals with privacy and security. "There's an indelible log of information about your daily activities and my daily activities that passes through the communication network," says Paul Henry, a researcher at AT&T Labs. "The opportunity for abuse is just enormous."

Before this comes to pass, of course, there's work to do. (And venture capitalists are eager to help out--wireless is the brightest light in an otherwise stalled tech economy.) Right now, there's a swarm of incompatible technologies. Users of each form distinct techno-tribes. BlackBerry folks are hard-core business types who want to make the most of every second and can afford the costly monthly fees. Then there are the enhanced two-way pagers, blessed with celebrity cachet. Motorola gives them away to the likes of Adam Sandler and Kid Rock. The makers of mobile phones are pinning their hopes on a standard known as 3G (for third generation). It basically delivers broadband Internet to phones. NTT DoCoMo's 3G headsets have little video cameras in them so people can see each other when they talk. Nokia has a model that plays MP3 music tunes.

For connecting appliances to each other, there is Bluetooth. With a current range of about 30 feet, it's strictly local. A Bluetooth-equipped electric guitar could automatically transmit to the nearest amp, and prospective Eric Claptons could wander from room to room, trailing their guitar licks with them. After a slow start, Bluetooth is getting a boost from companies like Sony. "To us," says Sony America CEO Howard Stringer, "wireless is the way to network all our devices."

But the star standard of the wireless world is geekily named 802.11b, pronounced like a math major's mantra: "eight-oh-two-eleven-bee." Merciful marketers have produced a spiffier moniker: Wi-Fi. Ever since Apple Computer presciently adopted it for its home-networking scheme, it has been the breakout choice for local networks. You can find it in hotels, airports and your corner Starbucks. Wi-Fi punks in New York, Seattle and the Bay Area have organized a movement to beam free 802.11 nets into busy public places. Microsoft's Windows XP software has built-in support--if your laptop has the \$100

802.11 card, it can smell a hot spot and link you in immediately. Expect Wi-Fi-equipped Internet radios, TVs and maybe even that long-awaited Net Fridge.

Ultimately, we'll wind up with a hybrid system that seamlessly moves from one scheme to another. In hot spots like your home or a coffee shop, you can expect cheap, speedy Internet access. When you're roaming or on some beach, you'll switch to more costly mobile-phone-style systems.

Then the fun can begin. And so will the complications. In the home, expect the estimated 3.5 million home computer networks to multiply rapidly. The main use now is to share Internet connections--sibling battles over Web access "have gone away," says Gary Matos, an Intel exec with a home network. Now his problem is that the kids spend too much time online, and he's had to impose limits. With all that extra downloading, there can be storage problems but the long-range vision includes an "information furnace," a massive server in a closet or the basement.

And you think you've seen ugly battles for the remote control? Just wait until one device controls everything. Early next year Universal Electronics will kick off a new era by introducing Valhalla, a system that transfers the power of remotes to other devices, like palmtops, Web pads or even a remote-control watch called the Midas. Point to any appliance in the house and, on the screen of a Valhalla device, a virtual remote pops up to control it. Now here's the scary part: since it can be hooked to the Internet the device might eventually become a sort of cash register. "You might be watching 'Friends' and want to know what kind of sweater Ross is wearing," says Universal's Rob Lilleness. If the show's producers have properly prepared the links, "you can point to the sweater and impulse buy." One can only imagine what comes next. Buy me the glasses of Ashleigh Banfield!

When you leave the house, the action won't stop. Though the auto industry initially overestimated how quickly the public would adopt "telematics" (its term for connecting autos to mobile phones, satellite navigation and the Internet), it still expects drivers to ask dashboard-mounted units to read back e-mail, make stock trades and link to the myriad Web services provided by Microsoft or AOL that will remind you to meet your nephew or warn you that your flight is canceled. "Telematics will change the way we communicate: says consultant Michael Heidingsfelder, who expects 44 million cars to be connected by the end of the decade. Meanwhile, marketers salivate at the idea of the Internet version of the billboard--a message piped into

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your car to let you know you're near their business. Free fries if you stop at the next Mickey D's!

We might need a new etiquette for wireless behavior at school and the workplace. Consider the way meetings have changed at Microsoft, where the entire campus has been wired with Wi-Fi. On one hand, the gatherings can be much more efficient, as questions about projects or sales figures can be instantly answered with a quick check of information from the network or the Internet. But the presence of a connected computer also seduces workers to zone out of the meeting. At Microsoft, where social niceties have always taken a back seat to relentless productivity, doing e-mail at a meeting is acceptable behavior as long as the person isn't directly involved in the discussion at that moment. But in some settings, the presence of wireless networks have already triggered conflicts, like the law professor who banned students from using laptops for any non-class-related tasks.

Perhaps the best indicator of the true weirdness of the wired world comes from a humble \$25 toy called POX. It is a wireless game that doesn't connect to the Internet, but sends out a short-range signal that looks for another unit. When that happens, a fight ensues between the software "warriors" programmed by the kids who own the toy. Generally, kids pull out the units to start battles, but not necessarily. So one night when Ben Vallone, an 11-year-old in Chicago, was eating dinner in a restaurant near his house, his POX made a weird sound. He looked at the display and discovered that his warrior had been clobbered by an unseen "Rocky 2."

Ben's experience is a good reminder that wireless really means superwired. The physical cables aren't there, but we are virtually bonded to networks, machines and other people--some of whom we know and some we may not. Presumably, we can flick off the switch, but as we become accustomed to steady communication with friends and family, and constant updates of our environment, we may not want to. Immersion in a wireless world may bring families together and allow them to share experiences remotely, but it could also mean that no one has anyone's full attention, as Mom or Dad is never more than a thumb-typed e-mail away from work, and Junior is always plotting his next move on some online game. Choose carefully, because we will ultimately get the wireless technology that we deserve.

With Deborah Branscum and N'gai Croal in San Francisco, Jennifer Tanaka in New York and Keith Naughton in Detroit