WORK & CULTURE

Cellular Phantasmagoria:
Stealth Towers, Roaming Borders and Global Cities in the Air

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*The Cellphone Project: Demobilizing,
Delinking, Disconnecting the
Commodity Chain*

A few weeks ago, rushing to expand cell phone coverage in northeast India, the state-run company BSNL put up a number of cell towers near the country's border with Bangladesh. Almost immediately, the Indian government ordered the company to take the towers down. Bangladeshi militants were swiping signals from the towers in India to communicate with cells in Calcutta and Bombay, as well as intercepting Indian intelligence reports. But the political groups were only the tip of the iceberg. The towers by the border enabled numbers of regular people in Bangladesh, using Indian phone cards, to make local calls in India, calls which normally would have cost exorbitant international rates.[1]

In the Rio Grande Valley, Laredo and El Paso, where Texas borders with Mexico, cell phone users woke up in fall 2002 to bills bearing charges in the thousands of dollars, most of them from calls placed in Guadalajara to banks in Germany and Spain. Using electronic scanners, people in Mexico were snatching phone numbers out of the air around transmission towers on the U.S. side, and cloning phones, often to cleanse drug-trade phone records from legal scrutiny.[2]

It's no secret that national borders have a fictional alterego. J.B. Jackson once traveled to the U.S.-Mexico border and wrote, "An abstraction, a Euclidean line drawn across the desert, has created two distinct human landscapes where there was only one before…Line and river, idea and unifying force, they have been made to divide an entity which the earth created and men accepted for some three hundred years—the Spanish Southwest."[3] On the ground, as Jackson suggests, natural formations mark borders; but they are usually helped along by military technologies. Security checkpoints, armed guards in booths and physical walls translate the political border into the official language of threat and warning.

Cell phone signals, like the air in which they move, naturally destabilize these borders. In the cases cited above, "service area" supplants state. Callers in Bangladesh who used the tower signals to chat with friends in India quickly shed the fiction of "international" long distance. The radiating signal from the towers united them with a community of people in India, who to them are and should be "local." The rapid spread of cell phone use in the country, and the company's hunger to serve the demand in their ensuing hunt for profit, made the border restless, recovering its secret, fantastic nature. Unbounded from the earth, wireless doesn't obey border strategies inscribed in the ground. It must be taught. Thus, the state stepped in to reassert its need for border sovereignty, teaching cell towers how to conform.

While officials used the Bangladeshi militants as their excuse, one wonders how much of the intervention actually had to do with those other people who were making local calls in India, exercising and shaping their imagined community through the phone lines. One could ask a similar question of the FCC's battle with those they called "drug dealers" on the border with Mexico. If dealers could do it, couldn't regular people too? Might not the crackdown be a

case of a national government assisting in securing the profits of the cell phone providers, some of whom also operate systems and towers in Mexico, where the fiction of the border allows them to charge heavy international rates on both sides?

But the cell tower, the physical side of the aerial service, resists sides. The cell tower's community runs not in a line, but in a circle, spreading around itself to all sides, or more accurately, in a hexagon, the shape that theoretically covers the most area with the fewest cells possible.[4] One might argue that the above are rare cases, but I would argue that cell phone service, by its nature, welds users into spatial networks very unlike the ones they see around them. Take a driver on a highway at night. The road signs on either side of her point her to her hometown in the distance, the voice of a friend murmurs through the phone, the cell phone carries her intimate life into the private space of her car. But as she drives down the road, cell towers in the landscape around her hand off the signal of her conversation. Her voice might be jumping between locations ranging from a farm to a gas station to a skyscraper to a parking lot. If a tower isn't there to receive the signal, the phone dies and the conversation ends. But she never sees the towers. The magic of the phone erases the towers.

Or take the phenomenon of international roaming—your ability to use your phone outside your country. For a segment of travelers, the roaming cell phone has become a symbol and metaphor for unfettered global mobility. Cell companies in Indonesia and the Philippines hunting for subscribers commonly advertise the list of places where their service allows you to roam, one list rising to 114 countries.[5] Roaming creates the physical experience of globality for travelers, eroding borders by staying active across them, without even a change in phone number. The journalist Joel Garreau calls these travelers "technomads." "My cell phone is my house," says one, who Garreau describes as a "one-man multimedia mini-conglomerate specializing in distressed nations—Russia, Macedonia, Liberia, Angola." For these people—readers of articles such as "Is your phone world-worthy?"—where your cell phone works determines what places enter your global imagined community. Garreau claims that these technomads "no longer have a human identity tied to place." They forge gleeful cyborg identities. One named his daughter Ariel after his cell phone antenna.[6]

International roaming depends on two factors. One, that your provider has partnership roaming deals with providers in other countries who will feed you a signal from their towers when you move past them. Two, that your provider and providers in the other country use the same technology. Globally, there are basically two systems now: Global System for Mobile Communications and Code Division Multiple Access. Much of the world uses GSM, particularly Europe, Africa and many parts of Asia, especially Japan. CDMA and GSM split customers in the Americas and east Asia. Although the disparities between places pop up in the varying prices for roaming, from 99-cents-a-minute in the U.K., for instance, to $3.99 in Kuwait and Uganda, the social experience is of oneness.[7] The charges

don't show up until you get home, or if your home is your phone, then until you get your bill. And as with my opening examples, the signals from towers can sometimes take on a life of their own, trumping negotiated borders and agreements. In some cases, your cell phone only locks onto the strongest signal, not the cheapest. Companies have had to train people to trump the roaming of their own phones, to learn how to manually choose which service to use when they arrive in a country, rather than having their phone randomly pull their community out of thin air.[8] The Indonesian company Satelindo has fought back against the business lost through this free roaming by offering massive long distance discounts to subscribers making calls within its network, even to other countries, reconfiguring boundaries based not on nation but on brand.[9]

But as should be obvious, despite Garreau's argument that technomads sever themselves from place, cellular roaming, whether it be in the car on the highway at night or on the global business circuit, is always tied to at least one: the cell tower. Cell towers shadow the free-ranging signal and fix it in place. As cellular service spreads globally, shaking a sense of borders, the cell towers crawl along the ground after it at an accelerating rate, multiplying as service areas need expansion. Many in architectural circles would posit the skyscraper as the signature global building, and megacities such as Kuala Lumpur or Hyderabad as only its latest home. I would make a pitch instead for the cell tower, which, at this point, may be the most common new global architectural form in the world.

The spiny steel towers spike across urban, suburban and rural landscapes alike, pincushioning the globe. While some, especially in denser areas, fasten onto existing water tanks, bridges, rooftops or old incinerator chimneys, most commonly appear as freestanding cylindrical steel monopoles, latticework towers and flat-pan antennae with a height of 25 to 125 feet in flatlands or up to 200 feet or more to rise above the tallest trees in wooded areas. Prefab metal buildings at the base of the towers, or underground waterproof vaults, protect the transmission equipment.[10]

The appearance of the towers is remarkably similar from country to country, and almost universally despised. This disdain for the cell phone's built environment may seem ironic given the massive expansion in users. But it shouldn't. The cell tower belies the invisibility of service, that dream of unfettered mobility. You want to use it, you don't want to see it. The tower punctures the bubble of intimacy and freedom occupied by the global roamer with an ugly, infrastructural symbol of the market. It also reminds the user of the corporate presence hovering over a technomadic community, which, despite its claims, can't yet live inside its phones. But most importantly, the cell tower provides an alternate frequency on which to discuss the phenomenon of globalizing space outside the business-parks-in-cities, financial-flows model of the Global City theorists.[11]

For one, so hated is the cell phone tower that it has engendered a new protest politics the world over, shifting in form but united in enemy. In

Bischofsheim, Germany, people climbed up to two cell towers on a local firestation and slashed the cables.[12] New towers in Calgary, Canada, a center of resistance, have met with active street protests, as did a project in Kobe, Japan's Tarumi Ward.[13] In Scotland, a company found the tower it had sited on top of a hill once inhabited by witches completely sabotaged, and vital pieces gone altogether. When asked, local residents said the witches had done it.[14] In County Cavan, Ireland, residents blocked a road with trucks to stop the construction of twelve new towers, and shut down a council meeting.[15] In New Delhi's sensitive Lutyens' Bungalow Zone, twelve cell phone towers, already prohibited by the Delhi Urban Art Commission, came under attack.[16] In Natick, Massachusetts, U.S. residents jammed public hearings and threatened lawsuits to defeat a tower in the cemetery where Horatio Alger is buried.[17] Vocal protests in rural areas of KwaZulu-Natal, South Africa and urban areas around Windhoek, Namibia have also scuttled towers.[18] The battles happen for two reasons: aesthetics and health. On the one hand, people think the naked steel towers flashing beacon lights to planes at night visually contaminate serene rural landscapes, protected ecological zones, and pleasant neighborhoods and their property values. On the other, people worry what the twenty-four-hour low-level throb of radiation circling out from the towers might do the human body.

The industry has responded to both concerns with the stealth tower. Stealth towers are cell towers with all the same functions, but designed to simulate indigenous features of the local or regional landscape. They likely grew out of earlier efforts to paint regular cell towers to match the landscape, sky blue, grass green, or in some cases, red to match brick edifices in cities and suburbs. While the first stealth towers were located inside tall gas station signs by the sides of the highway in Southern California, in the early 1990s, tower design companies began to experiment with more elaborate simulations, starting with trees.[19] Larson Camouflage in Tucson designed one of the first, erected in Monument, Colorado, in 1994. Engineers had to develop a tree with no excess metal so it wouldn't disrupt the radio frequencies. They used structurally reinforced fiberglass for the branches and plastic composite leaves. For the brown, weather-resistant bark, they experimented until they developed a special epoxy that looked natural enough.[20] Since then, in the hands of tower design companies with names like South Carolina's Stealth Concealment Solutions, hundreds of trees have spread across the American landscape. Most of them are pine trees and conifers in the north and palm trees in the south. As time passes, the match for local landscapes has become more exacting: red firs and ponderosa pines in Idaho, for instance, and three-story saguaro cacti in Arizona.[21] Companies have even begun to install fake owls and the recorded cries of a hawk killing its prey to terrify birds who try to nest in the synthetic branches.[22]

After trees, the second most popular stealth design is the church steeple. One major tower designer calls these steeples "ecclesiastical solutions."[23] For steeples destroyed in hurricanes or fires, such as the one on a 159-year-old church

in Nantucket's historic district, the industry swoops in and replaces the steeple with a close-to-perfect replica.[24] In cases where steeples exist already, cell companies design false additions that mimic the original architecture. Since 1983, the National Cathedral in Washington D.C. has received an estimated $100,000 a year from Motorola to lease its west tower for a 234-foot antenna. On smaller churches across the United States, stealth towers commonly draw between $1,000 and $1,700 a month for congregations. Designs vary based on the architecture of the church.[25] At a church near Seattle, a company used three tall poles joined at the top by panels bearing crosses.[26] In the southwest, there's a stealth steeple of white stucco, and in Massachusetts, one composed of fiberglass panels molded to resemble the original's slate shingles in color and texture. The pieta of stealth technoreligious architecture is the 144-foot, freestanding Romanesque bell tower on the grounds of a convent in Mendham, New Jersey, done by the engineering firm Edwards and Kelcey for several carriers including Bell Atlantic. Constructed from stacked prefab concrete modules, with a cast-in-place foundation, the tower incorporates details and material from nearby historic structures and supports a cross on its peak. The antennas are hidden in the top of the tower, behind louvers made of radio-frequency-transparent fiberglass panels that replicate the copper originals. The convent receives $60,000 a year for hosting the site.[27]

By the late 1990s, the idea of stealth towers had migrated along a fairly wide global circuit, and the potential for architectural simulations grew accordingly vast. Grain silos became the pick of rural America, giant boulders and artificial rock ledges bordered mountainous highways, elsewhere flag poles, water towers, fire lookout stations, clocktowers and windmills took in cell towers to create a series of hybrid vernacular forms. Stealth steeples now spire across Australia, Britain and Canada.[28] In Nigeria, Stealth Concealment is building an internally illuminated architectural tower on top of a bank.[29] In Indonesia, Alan Dick & Company has built thirteen stealth minarets for mosques, complete with green domes at the tops, and is now trying to market them in Malaysia.[30] Edwards and Kelcey have designed a series of stealth minarets for the Saudi Arabian government, as the country will need at least 100 new towers for its new $5 billion wireless phone system.[31]

To me, these more sophisticated simulations suggest a strange paradox. On the one hand, cell technology, imported from vastly divergent global networks and connecting residents to these networks, fully infiltrates more and more places. On the other, the traditional minaret, the nineteenth century grain silo, cover over this new global element in the landscape. The more these places "globalize," the more they *look* local. Thus, the stealth tower provides a two-fold service. For the roaming technomad, the stealth tower allows the effortlessly mobile side of the cell phone to retain its hocus pocus magic. If you can't see the towers, it's almost as though they aren't necessary at all. But for the place-bound local resident, the stealth tower produces an image of a hermetic local, untouched by time, perhaps even more perfect than it ever was in real life.[32] New technology

might hover somewhere in the blue beyond, but if it's invisible, why worry? Why? Well, I would argue that corporate globalization depends on this image of a local untainted and undisturbed to succeed without resistance to its terms.

That designers invented the stealth tower explicitly to defeat such local resistance confirms this link. But it takes on a particularly sinister character, I think, as companies start to use stealth towers to meld with parts of the local landscape changed by other features of what we now call globalization. Some stealth towers use the defunct scenery of urban deindustrialization as their mask; long-dead smokestacks and inactive chimneys radiate again with secret energy from the roadsides.[33] Others, descended from the influential 2000 National Register of Historic Places pamphlet *Locating Telecommunications Towers in Historic Buildings*, prey off the wounded public trust to help once federally supported historic buildings stay open. The first building to hold a public town meeting in the United States, a church in Massachusetts, ironically, now hosts a privately built stealth steeple.[34] Towers on public lands raise more than $5 million for the U.S. government, money which one congressman wants to devote exclusively to FBI wiretapping.[35] This alliance between stealth towers and neoliberal privatization has a sense of premonition to it for other countries, especially considering that the origin of many wireless tower networks around the globe lies in the mid-'90s privatization campaigns of publicly owned telecom systems, such as Ghana's, privatized in 1996.[36]

Still, the tree remains the most popular disguise. Everyone has trees. Palm trees hiding cell towers have so dominated the South African landscape that they are mentioned in a recent travel guide.[37] Fiberglass palms can be found across the breezy Gulf states, as well as in Brisbane and on the seacoast of France.[38] A stealth cypress commands attention on the autosole between Florence and Arezzo, Italy.[39] Pine trees tower over organic rivals just as motorists exit Malaysia's Sungai Besi highway near Istana Negara. A Scots pine occupies the Putrajaya Wetlands Park.[40] Now, as should be obvious, some of these stealth towers are not very stealthy. A Scots pine in Malaysia? A boy observing a tower shaped like an American pine, which soared 25 feet over its neighboring and totally different-looking trees in Cockermouth, Britain, aptly diagnosed the problem.

"It doesn't move when the wind blows a gale, it just stands there," he said.[41]

That's something that should be mentioned about stealth trees. They don't always really look that much like trees. For one, the towers are often gigantic compared to their neighbors. A three-story cactus? Secondly, they are often obviously synthetic substitutions. Ultimately then, the stealth tower only wishes it could cover over the cell phone's presence in the built environment. Instead, it becomes a kind of knowing and unknowing architecture, a blind-in-plain-sight design tactic, re-enchanting the dreary steel infrastructure of the cell tower with a comforting, simulated image of the local. So much do some people want the

comfort they're willing to ocularly erase the imperfections and accept the restored regional landscape in all its apparent wholeness.

Now, some of this has to do with the lack of an alternative. Developed as a strategy to circumvent property-minded local revolt in the U.S. and ease acrimonious tower-siting battles, early stealth designers wanted the towers to at least approximate invisibility and camouflage, hardly a manifesto for radical design. Some have moved to turn towers into artful objects in their own right. Working with local groups in New Zealand's Styx Mill Reserve, architect Perry Royal designed what one writer called a "sculptural tower of sweeping fern-like panels."[42] India recently set up a National Standards Committee on Tower Design, and T-Mobile and the Denver AIA hosted a competition last month for alternative tower designs. But even these design professionals asked entrants only to consider "the placement of stealth towers as suburban landmarks and neighborhood icons."[43] The stealth tower has social power. A cell tower that looks like something else, something natural, spiritual, or nostalgic, by the very fact that it looks like something familiar, soothes away the shock of seeing how human cultural fads physically alter and transform the built landscape at a blindingly rapid pace, ruining the cell phone's promise of invisibility. People even seem soothed by the idea that the new tower could exist naturally *somewhere*. Some of the most comic episodes involving the stealth tower have come in its mismatched global export, such as a series of palm trees that arrived in Moscow late last year.

MegaFon planted Russia's first 27-meter palm tree on Vyatskaya Street in Moscow in October, and this year, sited 10 more palm trees on the Moscow Ring Road and the road to the Sheremetyevo airport. The reasoning offered for the palm design seemed shaky. Divo, the company that won a contract to manufacture the trees, undercutting a Finnish supplier, claimed that bare palm trunks resist wind blasts better than other trees and that the palm leaves make it easier to hide antennas. One local writer somewhat apologetically assured readers that palm trees are used "even in cold countries like Finland." Severed from any relationship to locale and landscape, the palm tree became an aesthetic in and for itself. Unlike conversations in other countries that centered on the palm tree's degree of invisibility, imperfect as it was, in Moscow, talk quickly turned to its visibility.

"This is an original form of advertising," said one market analyst. "If potential subscribers start associating palm trees with MegaFon it would be a successful marketing move," said another. VimpelCom, a larger MegaFon competitor, one news story reported, "doubts that palm trees will look good in the Moscow landscape." But MegaFon's representative disagreed. "Moscow's architecture is very eclectic and palm trees won't look too strange here," he said. "I think, Muscovites will like them."[44]

Here, the cell tower, once visible and ugly, has passed through its stage of false camouflage, and into its glimmering, spectacular phase. It fulfills a dream technomads might appreciate. The cell tower, the fusty physical accoutrement to

the unfettered cell phone, can itself unmoor local geography, transporting scenery from the south to the north. In appearance, the tower becomes a piece of floating architecture, once again erasing itself and its function from the landscape even as it grows more visible. In this transition, I would argue, it comes very close to the concept of a phantasmagoria, or what I would call a cellular phantasmagoria, which I'll explain.

In her essay on Walter Benjamin, "Aesthetics and Anaesthetics," Susan Buck-Morss defines phantasmagorias as "technoaesthetics." "The perceptions they provide are 'real' enough—their impact upon the senses and nerves is still 'natural'…But their social function is in each case compensatory."[45] Reality becomes a technically designed, mediated and altered narcotic taken to distract subjects from the shocks of the modern with a series of delirious "total environments of bodily comfort." But if these technically mediated realities are compensatory, what are they compensating for? Buck-Morss has an answer. "Technology as a tool and a weapon extends human power—at the same time intensifying the vulnerability of what Benjamin called 'the tiny, fragile human body'—and thereby produces a counter-need, to use technology as a protective shield against the 'colder order' that it creates."[46] Technology has a bizarre dual function. It opens the sensory world to us, in the cell phone's case, importing our intimate friends into our speeding cars, accelerating our informational input. But in distancing ourselves from our senses, in colonizing formerly private moments with the demands of contact, it alienates us from our former selves, and in the case of the built environment, physically chills our natural landscape.

Stealth towers can be seen then as technophantasmagorias that protect us from the contradiction between the unfettered mobility of the phone and the rapacious ugliness of the tower. The stealth tree and the stealth steeple are always aesthetic objects, falsifying local realities to give the sense that the accelerating changes in communication and the colonization of formerly personal spaces with talk associated with cell phone modernization have not altered local realities in the least. The stealth tower comforts us with a total environment imported from an earlier century. With it, we can still live in a world of pine trees and minarets and church steeples while walking through the countryside speaking to someone thousands of miles away who is not even present. But, in our hearts, we know the code is broken, creating an internal anxiety and rupture. The incantatory childhood prayer won't protect us. Here is the church, here is the steeple, open it up, and out comes the radioactive cell phone tower? It's just not the same.

The farther the stealth gets from its source, the more this uncanny magic increases. Strange objects come to earth, filled with voices, information. In Moscow, the palm tree is not only an aesthetic object, but also a kind of wondrous one. These are magical trees, they carry messages, conversations, they transmit invisible waves through the air. They could never grow at home, because of their non-native design, but also because of their secret, complex properties. But the wonder of the stealth tree in Moscow reverses itself and begs the same question

from stealth towers elsewhere. Trees and steeples don't harbor such widespread popularity by accident. They provide the obvious pleasure of securing the bounds of your natural environment, but also, I think, a secret, secondary pleasure. They allow you to see the transcendent, spiritual and religious architecture of the early English and American landscape and the trees that fed the flights of early romanticism in poetry and painting reincarnated, respiritualized through the magical, technological aura of the cell tower. The numerous reverential headlines on stealth steeple stories, such as "Divine Calling" and "Higher Calling," point to this fact.[47] Stealth towers meld the technological and the sublime.

The strangest thing then perhaps is that we know the stealth tree is false from the beginning. We agree to be fooled. Why is that?

Again, I think Buck-Morss has an answer. Modernity's aesthetics don't only enchant and numb you in the abstract. What of that other side of her formulation, that technoaesthetics cover for a regime that actually endangers your body more than ever? Modernity brought with it a real bodily threat, a near ungraspable insecurity and instability, made tolerable to the human mind only by constant, bombarding distraction. "Threatened bodies, shattered limbs, physical catastrophe—the realities of modernity were the underside of the technical aesthetics of phantasmagorias as total environments of bodily comfort," she writes.[48] New research on the effects of tower radiation on human bodies show that this pole of Buck-Morss' argument holds as well. Scientists have found that the ceaseless throb of low-level radiation from cell towers can over the long term actually alter your DNA. In a word, the cellular is cellular. Like the bombs of World War II and the mangling machines of the factory in Benjamin's era, stealth towers may even be able to kill you.

In June 2000, scientists from around the globe convened the first International Conference on Cell Tower Siting in Salzburg, Austria to pool collective knowledge on its public health effects. At the time, the participants consciously thought of themselves as an alternative body to the World Health Organization, which had recommended radio frequency emission standards far below what they considered safe. One speaker introduced the entire conference by calling the WHO "blind in one eye or deaf in one ear" on the issue. Over several days, researchers recounted potential health hazards from chronic, low-level exposure to the cell towers spreading across the international landscape. In case studies, Chinese researchers found evidence of headaches, memory loss and slight changes in the lens of the eye in those living near towers; Polish scientists discovered that the towers caused people's heartbeats and blood pressure to vary between day and night; in New Zealand, doctors warned of cancer, neurological and reproductive malfunction; in Switzerland, the towers induced sleep disorders.[49] A U.S. study reported disturbing effects that included behavioral aberrations, neural network disturbances, fetal tissue damage, altered blood chemistry and immune system suppression. Researchers also suggest that the most severe bioreactions can occur at the lowest exposures, as with cell towers.[50]

The veil of the stealth tower then seems all the more dangerous. For in this way, you could be walking past an innocent-looking pine tree every day, only to find out that slowly, ineluctably, the stream of silent conversation pulsing in the air around it has minutely altered your cells. In the same way that the surrounding landscape has been altered but appears identical, your body has been altered but appears the same too. The built environment and the human body enter into a cyborgish feedback loop of secret transformations, all masqueraded by the aesthetics and anaesthetics of the body-snatching stealth tower, which aims to render the source of these mutations invisible.

The stealth tower operates as a phatasmagoria in this manner. It doesn't change aesthetic and health concerns about cell towers. But it parries them. Amidst a general feeling of human powerlessness in the face of stunning technological change, the stealth tower allows you to pretend to forget what you know instinctively, making livable, dare we say, enjoyable, a landscape that might be killing you. It is interesting, in this light, that this undermining architecture comes under the military rhetoric of stealth, as in stealth bomber, that other side of advanced technology that makes the U.S. so efficient at getting out its message around the world. It is perhaps only an unfortunate historical irony that the first stealth bombers were delivered to U.S. air force bases—"*low-observable, strategic …capable of penetrating sophisticated and dense…defense shields…the ability to fly to any point in the world within hours…*"—at the exact time the stealth cell towers found a name and entered the market.[51]

But how should a technomad feel about all this, as he takes cover in the shade of a synthetic palm tree in Russia or Angola? His phone might be his home more than he knows, conducting his cellular conversations into permanent residential quarters within the cozy cells of his body. But even if he has heard about these effects, no doubt they seem a long way off to him, a little hard to imagine. While roaming, he certainly won't think about the U.S. stealth bomber or the U.S. origins of the stealth palm tree. If he hears names at all on his journey, they will most likely come in the blinding flurry of local providers that allow his phone to roam the globe: Cellnet, Celcom, Cellular One, Kencell, Cantel, Digitel, Nextel, Powertel, Bharti Cell, Microcell Connexions, Global Crossing, Globe Telecom, Hanaro Telecom, China Unicom, Korea Telecom, Millicom Ghana, Safaricom, VimpelCom, Vodafone, MegaFon, Spacefon, NTT DoCoMo, MTC, IDO, KDDI, BSNL, Aktel GSM, AFK Sistema, T-Mobile, Maxis Mobile, Bell Mobility, Telus Mobility, Thrunet, Jawwal, Satelindo, Cingular, Smart, Sprint, Orange, Optus, Omnipoint. But for all the different names, for all the feeling that the technomad has entered a perfectly decentered, endlessly globalized and yet beautifully interconnected world of diversity and difference, they might as well be the same name to him, different features of the same shimmering network that has freed him from the bounds of place.

They might as well be the same name to him, for in reality, underneath them, there often are the same names—those of the companies who own the

international patents on the underlying network infrastructure that makes global roaming, not to mention cellular service, possible. Call them by any name you want, cell phone services today do not function without at least a basis of one of two technologies I mentioned earlier, GSM or CDMA. A brief examination of the history of those two technologies begs important questions for the study of globalization. Namely, where does present and past imperialism leave off and globalization take hold? Where do they rub shoulders?

In many ways, the global dimensions of cellular phones upset that breed of globalization that's often hard to distinguish from U.S. imperialism. Cell capability, style and technology in Asia far surpasses that of the United States. Nokia, one of the industry's biggest manufacturers, resides in Scandinavia. In the Philippines, citizens have used text messaging to revolt against their government.[52] A slew of countries trump the U.S. in cell phone use. In October 2000, nearly 70 percent of the people in Finland had cell phones, nearly 60 percent in Hong Kong, 50 percent in Singapore and Japan; but in the U.S., just over 30 percent.[53]

When you dig to the root technology, these figures do not lose their meaning, but they do begin to look a little less world-altering. At its heart, one could sum it up by saying that CDMA belongs to the Americans and GSM belongs to the Europeans. The globe of technomadic molecules in orbit begins to look more like your usual backyard slugfest between the superpowers. The list of sleek company names uniformed for the wireless future in their spit-shined "cells" and "coms" begins to look more like the stealth tower—simulations of locality in a world corporately directed from the west.

CDMA—in an uncomfortable echo of the synergy between the stealth tower and the stealth bomber—arose out of anti-jam technology used by the U.S. military in World War II. Its patent is entirely controlled by the San Diego company Qualcomm.[54]

GSM came out of a push in the early 1980s by Scandinavian companies who wanted Europe to develop a united standard for wireless. By 1987, European countries had signed a "memorandum of understanding" on GSM, and in 1992, an operator in Finland rolled out the first network. A string of world conferences at once and future imperial centers such as Rome, Berlin, Lisbon and Athens hawked the technology through the 1990s.[55] GSM is now used by one out of every six or seven people on earth, in 206 countries, reaching 80 percent of the global mobile market.[56]

In light of the conversation at hand, it is interesting to note how the spread of the technologies has seemed to follow historic imperial routes, or "spheres of influence." CDMA quickly dominated Central and South America, while GSM found its first African foothold in South Africa in 1994, and now controls the continent. The two share Asia. CDMA is popular in South Korea; GSM, thanks to Japan, which heavily backs the technology, extends to a variety of other southeast Asian satellites. Anyone in these countries providing cell phone service pays

regular royalties, like imperial grain tributes, back to the western companies who own the patents, giving a whole new meaning to the concept of "service area."[57] The global imaginary of the roaming borders might in some cases merely be the colonial imaginary under stealthy new digs. The spread of stealth towers, first to the UK and Australia and Canada, and then up from South Africa through Namibia and north Africa, has similar echoes.[58]

As third generation wireless technologies gain momentum, that is, cell phones equipped with streaming video and audio, elaborate video games and high-speed internet access, this pattern replicates itself. CDMA has yielded CDMA2000, also owned by Qualcomm. GSM has passed the crown to wCDMA, or wideband CDMA. Forty companies claim more than 700 essential patents for wCDMA.[59] But Swedish giant Ericsson holds 40 percent and Nokia, from Finland, owns 25 percent. The other major owners are the Japanese company NTT DoCoMo, Motorola, based in Schaumburg, Illinois, and, ironically, San Diego's Qualcomm, playing both sides.[60] For five years, all manner of groups struggled to create a single standard for 3G. The companies refused, limiting the possibility that we will ever see a total global wireless system. 3G launched in Asia in 2001, and already the patent holders receive from one to five percent or more from anyone who uses the system.[61]

These patent issues are by no means idle aspects of the global spread of cell phone technology. In the last few years, for instance, companies have fiercely battled to dominate the burgeoning cellular market in China. Unlike other countries in southeast Asia, China arrived late to cellular, opening what one analyst called "the last great market," with a population of one billion. By 2000, 100 people a minute were signing up for cell phones. And still, only 5.6 percent of the population was using them, driving global cell companies into heat. For Qualcomm, whose CDMA technology was spreading through the world at a laggard rate, infiltrating the Chinese market became crucial. One might question whether one should even consider a multinational such as Qualcomm an "American" company anymore. Except for the fact that, when China wanted to join the World Trade Organization, it was the U.S. government that forced them as a binding condition of entry to license radio spectrum for Qualcomm's less popular CDMA technology. The Chinese agreed, then put the licensing on hold.

For second generation cell phones, the country split into a dual channel system that used both GSM and CDMA. In the meantime, to battle against becoming just another western satellite, China provided $72 million to the state-run Datang Group to develop their own third way technology, called time-division synchronous CDMA, or TD-SCDMA, which debuted in November 2003. The state licensed more spectrum to TD-SCDMA than to either of the competing technologies, and has stalled its decisions on 3G until 2006 to give Datang time to develop its products. Qualcomm has responded by claiming patent rights on TD-SCDMA as well.[62]

Patents for the more scattered wCDMA have drawn equal ire from those who have been subjected to them. In a 1998 report to the European Commission, the International Telecommunication Standards User Group reported that GSM patent rights have blocked new companies from entering the market, hobbling them with high royalty rates. No independent body verifies the patents; so companies themselves have to do it, which can often be prohibitively expensive for new companies in the so-called third world, especially since large corporations commonly lie about their ownership in order to improve their negotiating positions.[63]

Any analysis of global cell phone dissemination needs to take into account these hidden certificates that underlay cellular infrastructures. If the freely roaming talk of the cell phone represents the overlay on the cold infrastructure of the cell tower, the cell tower, in a sense, is the overlay on the cold infrastructure of the patent. To see the global network in all its implications, we need to root down to the infrastructure of the infrastructure, then build back up again. For instance, 3G technology, often touted as the streaming future of ultra-liberated wireless mobility needs even *more* cell towers and antennae than its earlier ancestors.[64] Thus, the patented and accelerated 3G technology will depend on the more elaborately simulated stealth tower to keep its physical presence palatable, amplifying the cell phone's feverish dream state, as its impact on the global built environment widens.

But how far will it widen? Some speculate that within a decade satellite phones beaming down from space could take the place of the cellular phone.[65] The sweep of one satellite signal could render hundreds of thousands of cell towers obsolete. And since companies have no responsibility to remove them, what would become of these cellular cities of monopoles and chimneys, trees and steeples and masts? Our era's most prolific global architecture could very quickly become the millennium's first monument to mass obsolescence.[66] What will the stealth towers look like when they're rotting all around us, melancholy synthetic forests, the epoxy flaking off their trunks? When 3G and cellular sound like pneumatic and steam? When corporations get so stealthy we can't even see their infrastructure on earth anymore? When they can float the things that make people protest way off in outer space?

Perhaps then at least, people will appreciate the global presence of the cell tower. When the shields come down, and they appear in plain sight, in city, suburb, country and town, on every continent, on every border.

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[1] "Move Cell Towers from Border: MHA to BSNL," *Indian Express*, 17 March 2004. The Indian government had a similar problem late last year when Pakistan installed a series of cell towers close to the "Line of Control" near Jammu and Kashmir to communicate by cell phone with militants across the border. See "India: Army Officials Note Kashmir Militants Using Cell Phones, Internet, E-mail," *Global News Wire, U.S. Department of Commerce World News Connection*, 15 October 2003.

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Companies Land $1.5 Billion Worth of Work to Start Building CDMA Network—China Unicom Deals Spur Local CDMA Action," *Electronic Engineering Times*, 28 May 2001.
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