

## BRITTLE CITIES ARE EASILY BROKEN

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*Toronto Globe and Mail*

Saturday, July 23, 2005

“If there’s another major attack, people will leave the city in droves.”

Andrew, a colleague of mine in New York City, was sitting in his office in a building not far from Grand Central. It was October 2001, and I’d phoned him from Canada to discuss some business. But our conversation quickly turned to the city’s fevered mood. After the attack on the World Trade Center and a string of anthrax letters, New York’s normally thick-skinned inhabitants were near their tipping point.

Of course, another attack never occurred, so we’ll never know just how close New Yorkers came to the leaving the city en masse. But Andrew clearly thought that the psychological pressure on the city’s people had reached a critical threshold.

I’ve been reflecting on Andrew’s comment since hearing the awful newsflash about the second round of subway bombings in London last Thursday. His comment highlights, I think, the first of three factors that together make modern societies increasingly vulnerable to terrorism: how we define or “frame” these attacks in our minds. The second is the increasing brittleness of the hyper-complex technological and social systems. And the third is the rising technological power of terrorists to hurt us.

We can do a lot about the first factor; we can do quite a bit about the second; but there are only a few things—albeit critically important things—that we can do about the third. Unfortunately, the third factor may turn out to be most important, and ultimately it may override the other two.

In the last fifteen years, researchers have learned that the way we frame events in our minds crucially shapes how we respond to these events. In the wake of the 9/11 attacks, many New Yorkers were terrified. Little was known about the attackers or their methods and capabilities. So people filled in the blanks and jumped to the conclusion that their lives and the city as a whole were in imminent mortal danger. Across the country, the attacks primed Americans to interpret the small number of anthrax letters that were later

sent through the postal system as the precursor of a devastating bio-weapon attack. The result was near hysteria, as people besieged their doctors for antibiotics and buildings were evacuated at the sight of anything resembling a white powder. Because people had framed the danger in such extreme terms, another terrorist strike in New York in late 2001—an attack on the scale of 9/11 or larger—would likely have caused huge numbers of people to leave the city.

The same could happen in London if the current attacks continue and escalate in severity, and if the attacks are framed in the wrong way. News reports on Thursday’s bombings indicate that Londoners didn’t respond with the calmness they’d shown two weeks previously. “Witnesses spoke of a panic,” The New York Times reports, “after passengers smelled something burning on one subway car and rushed onto another to escape it, abandoning bags and shoes.”

Many experts on terrorism say we need to learn a lesson from Israel—a society that frames terrorist attacks as horrible but nonetheless manageable instances of chronic, low-level conflict. Even at the height of the suicide bombings in Israel, the country’s citizens for the most part went about their daily lives. The attacks led Israelis to adopt a range of procedures to protect themselves—they inspect bags at the entrances to restaurants and nightclubs, for example—but the attacks weren’t showstoppers and they didn’t induce panic, because most Israelis didn’t frame them as a cataclysmic threat.

The second thing that’s increasing our vulnerability to terrorism is the rising brittleness of many systems critical to our well-being. Our financial systems, manufacturing industries, transportation networks, information systems, and energy grids are, in some cases, extremely susceptible to attack. Some of these systems have critical “chokepoints”—like a key tunnel in a subway system or a high-voltage line in an electrical grid—where flows of people, materials, or energy can be easily disrupted. Also, in our endless quest to maximize efficiency and to squeeze out the last bit of waste, we’ve reduced inventories, buffering capacity, and slack within all our economic and technological systems. We’ve made them “tightly coupled,” to use the jargon of systems analysts. At the same time, our demand for services from these systems has soared—as we’ve seen with our hunger for electricity. This combination of factors sharply boosts the risk of cascading breakdowns.

People in southern Ontario had a rude introduction to such brittleness during the blackout in August 2003. We learned that, especially in our cities, we've become so specialized in our abilities and so dependent on complex systems for survival that when things go wrong—when portable phones, ATMs, water systems, subways, traffic lights, and the Web stop working—we can quickly find ourselves in desperate straits. If the blackout had lasted for a couple of days, instead of only ten hours or so in the city core, the situation could have become grim, especially for seniors living in condominium high-rises. Many of these buildings are thirty or more stories high, and some don't have windows that open. With the power off, many residents had no elevators, air conditioning, or water. After a couple of days of 35-degree temperatures, we would have been taking some of them out in body bags.

There's much we can do to increase the resilience of our cities and societies in the face of sudden shock—by loosening coupling within critical systems, increasing inventories (which means reducing our reliance on just-in-time production), and making it possible for individuals to help themselves when systems break down. But almost without exception, we aren't doing these things. So, despite the lesson of the blackout, and even though we've been warned that Ontario faces a critical electricity supply shortfall in coming years—a shortfall that makes repeated brownouts and blackouts more likely—few if any high-rises are being fitted with standby generators.

The third thing that's increasing our vulnerability is the rising power of terrorists to hurt us. Londoners were lucky that the recent attackers used only conventional explosives. They were also lucky that—in the case of Thursday's attack—the terrorists were apparently incompetent. But our luck won't last forever, especially given the rapid diffusion of knowledge about how to make devices that can kill large numbers of people. Most experts believe that sooner or later, a terrorist group will succeed in using a non-conventional biological, chemical, radiological, or nuclear device.

The most appalling possibility is, of course, the detonation of a nuclear bomb in major city. Even a relatively small nuclear explosion would do catastrophic damage. It's hard to make such a bomb, so the probability of this kind of attack is low, perhaps very low. But it's still vitally important for nations to gather up and render unusable the world's huge stockpile of

fissile material, especially highly enriched uranium, much of it sitting in insecure facilities in the Former Soviet Union.

As long as terrorists continue to use conventional weapons, our best response is to frame the danger appropriately—these attacks are not a mortal threat, and they don't pose a great risk to any one individual. We can adapt to the risk, as we go about the tasks of tracking down and eliminating the perpetrators and making sure our vital infrastructure and technological systems are more resilient. But if and when terrorists start using non-conventional weapons, these responses won't be enough.

And if terrorists get hold of the bomb, it could well be game over: it's hard to imagine how Western societies could sustain their liberties, institutions, and economic vigor in the face of such a threat. We should be doing everything we can to make sure it never happens.