REAL LIFE

STRUCTURE

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There is an old joke that technology is everything invented after you were born. Everything else we take for granted, forgetting how it had been developed, implemented, naturalized. It's easy to fixate on the novelty of screens and overlook how the rest of our environment already consists of technologies that are so familar as to seem immutable. Cities, buildings, clothing, transportation systems may not seem technological in the same way as digital devices, but they all are means by which social relations are sustained and given a graspable order. They all shape what kinds of thought are possible, what collective and individual aspirations can be conceived, what sorts of failure we may face. That is to say, they *structure,* and the innumerable iterative choices that have gone into them afford and preclude experience, extending new freedoms—and risks. The affordances of digital technology are so new as to seem somehow apart, a supplement to what's always been integral and "real" about our lives. But recognizing how the entire built environment is both structured and structuring makes it plain that what happens on screens is as real as the room you're standing in. —*Nathan Jurgenson*

TRUE-ISH GRIT

Rust Belt cities are turning years of neglect and decay into a soundstage for social media

by DAVID A. BANKS

At the crux of the Hudson River and the Erie Canal sits Troy, New York. It was once a thriving city, positioned favorably for commerce in a time when one of the most efficient ways to transport freight was with mule-dragged barges. But changes in transportation technology eroded its economic foundations: Containerized shipping and interstates moved freight further away, and prosperity went with it. With a population of just under 50,000, Troy is now roughly back to the size it was just after the Civil War.

One modest city institution that survived for a while was Trojan Hardware, which for 94 years held on by selling hammers and snowblowers to a community that had become an economic backwater. Its retail space snaked through the ground floors of several connected Victorian buildings, and when it finally folded, felled by the 2008 recession, those buildings stayed vacant for five years.

Then something happened that was both strange and strangely predictable: Trojan Hardware went from being a moribund seller of commodities to a fetishized commodity itself, a design motif for the new businesses that opened

ALEXIS BEAUCLAIR FOR REAL LIFE.

in its former storefronts: a microbrewery, an exotic-plants retailer, and a hardware-store-themed cocktail bar called The Shop, with chair rails made of salvaged Trojan Hardware yardsticks and many other Trojan Hardware relics adorning the walls. Each of these new businesses trades on the air of rootedness that Trojan Hardware still supplies, the aura of organic street life that the ghost of a longstanding neighborhood establishment affords.

If you go half a block south of the former Trojan Hardware, you'll come to a coffee shop that sells buttons proclaiming: "You keep Brooklyn, I have Troy." An art store sells T-shirts, mugs, coasters, and entire coffee tables that declare proudly in a typewriter-style font: "Enjoy Troy." The Troy of the 19th century was an industrial hub that exported its steel and other manufactures to the rest of the country. In today's Troy, a consumer would have no problem sating oneself with beers, coffees, and bagels that have been substantially prepared, brewed, roasted, and baked within city limits. One can enjoy Brooklyn bohemian quirkiness at an upstate discount price in the inarguably real environment of Victorian dilapidation. Troy has turned half a century of neglect into a competitive advantage, recombining rust and rot into quaintness and authenticity. Its genuine outdatedness is an opportunity to roll out state-of-the-art "place-making" renewal strategies.

But Troy is not the only moribund U.S. city that has fallen in love with itself. Entirely unique and one-of-a-kind midsize cities are a dime a dozen now. Troy is one pearl in a necklace of small towns in the Hudson River valley that are trading grit for service-economy glory: Albany, Hudson, Cohoes, Rensselaer, Schenectady, and Poughkeepsie and on through the Rust Belt of upstate New York, fanning out to Pennsylvania, Ohio, Michigan, and the outskirts of the midwest metropolises. They have all doubled down on Jane Jacobs's insistence that the best places to live are the ones that best preserve, manage, and then celebrate the heterogeneous aspects of urban environments: How a sidewalk is comfortably buffered from or introduced to the road, the way buildings and foliage enclose a space without making it feel crowded, the arrangement of street furniture such as benches and street lamps—all these go toward a well-made, livable urban environment. But even all of that doesn't quite capture it. A long-loved park or street corner is more than the sum of its parts.

Any given place has thousands of forces influencing it: A pocket park is shaped by everything from the frequency of blizzards (what can grow there) to the gerrymandering of congressional districts (how well it is cared for). Jacobs's prescription was to not try and control all these things, because in trying to control everything, bureaucracies end up curtailing some of those forces that make a place unique and alluring. She instead suggested that planners provide and maintain the bounds wherein private and public actors interact. A good municipal-planning department will be able to recognize existing good urbanism and preserve it, restore what is dilapidated but still salvageable, and have the requisite foresight to know what zoning laws will leave room for construction that plays nicely with the existing streetscape. Good Jacobsonian urban planning involves a lot of observation of cherished neighborhoods or streetscapes and using those observations to inform future development. It is a future of cities rooted in the past.

In large, world-class cities like San Francisco and New York, the balancing act of preserving what works and carefully building or restoring new components has been going on for years. Williamsburg and Nob Hill have ascended beyond being merely iconic neighborhoods to become widely recognized brands carefully crafted to appeal to a particular demographic. Buying in to such a neighborhood is selling out: To rent a room in certain parts of Brooklyn is to pay cash for the cultural capital you would otherwise have to earn through "discovering" something not yet congealed into a recognizable commodity.

This link between "discovery" and the relative cultural value of a neighborhood gives smaller cities a kind of arbitrage opportunity in authenticity. By drawing attention to the commodification of neighborhoods in larger cities, smaller ones can position themselves as offering undiscovered, unmanipulated treasures. Some-

times this is as obvious as calling a neighborhood "the Greenwich Village of Albany," as the signs, stickers, and TripAdvisor reviewsaround Lark Street do, but sometimes the comparison is more inferential, a matter of a city's being continually discoverable as "undiscovered."

Urban development in the age of authenticity is a matter of walking the line between economic success and obscurity. In the 1990s and early aughts, a popular recipe for staving off economic decline involved overtly pandering to the "creative class" with quirkiness and diversity. Once the creatives live in your region, the theory went, a benevolent spiral of economic growth would inevitably take flight. This approach was so ungrounded in reality that its main booster, Richard Florida, retracted most of his thesis for it in 2013. He conceded in the *Atlantic* that "talent clustering provides little in the way of trickle-down benefits."

Many columnists and think-tank contributors have sought to fill the vacuum left by Florida's debunked creative class theory. Joel Kotkin, reacting to Florida in the *Daily Beast,* suggested that cities should modify their strategy and "cultivate their essentially Rust Belt authenticity rather than chase standard-issue coolness." But this is less a substantive shift than a semiotic one. A "cool" lifestyle is still the bait, only its terms have shifted toward more regional flavors. Cities that no longer produce physical goods can instead produce their own image as a kind of marketed product. If once they smelted steel or manufactured textiles, now they trade on the unique cultural history that is the legacy of those lost industries. The relatively cheap standard of living in places like Buffalo or Pittsburgh offer a more "authentic" urban experience in terms of sampling gritty make-do entrepreneurial creativity, while also letting new residents dismiss those in more expensive cities as unimaginative dupes taken in by luxury branding.

The sense of "authentic urban life" is twofold, according to sociologist Sharon Zukin's *Naked City* (2010): There is "the subjectivity that comes from really living in a neighborhood, walking its streets, shopping in local stores, and sending children to local schools," and there is the kind of authenticity that "allows us to see an inhabited space in aesthetic terms…. Is it interesting? Is it gritty? Is it 'real'?"

It is in this latter register of "authentic urban experience" that one can browse online for new places to live. To attract new residents, cities must understand how their character can be conveyed through a smartphone. Can your city support its own geofilter? Does it photograph well? Are there dramatic locales for selfies? What are your Airbnb listings, and how are the reviews? Is your transit viewable on Google Maps? The tourist map from the old visitors' center must become digitally augmented terrain.

And to play into the dynamics of attention metrics and online circulation, cities can encourage traditions that are also digitally embedded ("take a selfie with the mayor during the Saturday Farmers' Market!"; #summerconcert). Such ploys enact as sharable content the lifestyle that neighborhood boosters are trying to sell.

If places have become commodities, social media are platforms on which cities like Troy might dream of competing. For such cities, photogenicity represents opportunity. Friends sharing Sunday brunch on a terrace, a dog being walked in a well-appointed dog park—such moments create a reproducible online brand built on an air of exclusivity. This rationalized quirkiness makes a local flavor known, sellable in the broader market of "those nice places to live." Once a city's obscure and unique qualities are made machine-readable and comparable across networks, the city's brand solidifies and can sit nicely on a social-media shelf.

Thanks to these homogenizing forces, the "authentic urbanness" that cities like Troy offer at a discount has become broadly recognizable. These cities are all banking on rebuilding their downtowns in the style of approachable authenticity. They all hope to be delightfully different while remaining nonthreateningly the same. They have become interchangeable in their uniqueness.

How did we get here? How did Jane Jacobs, the apparent champion of eclectic, organic urbanism, become the source for a new kind of homogenization? Urban preservation, which you would think would be an exercise in organizing the maintenance of city resources, has become instead a way of instilling an organized ignorance about how markets and commodification are at work.

In the last chapter of *The Death and Life of Great American Cities,* Jacobs traces how city planning sought to adopt methods from other sciences. City-planning movements in the 19th century saw the city in terms of ratios, akin to physics equations. Much as one could calculate the pressure and volume of gasses, one could solve cities' problems by working out jobs-to-housing ratios or by diagramming the balance of open space to population density.

The technique of seeing human habitats as diagrams was used across the political spectrum. The leftist Ebenezer Howard depicted his Garden City as a happy medium between the liberatory potential of urban and country living, while Georges-Eugène Haussmann, who reshaped Paris in the mid-19th century under the direction of Emperor Napoleon III, correlated wide boulevards and self-similar architecture with state-imposed civil order.

In the 20th century, as scientists tried to rationalize the behavior of billions of atoms into statistical probabilities, city planners aimed to do the same with cities. Urban planning evolved from an artisanal craft into a credentialed profession. Cities came to be understood as a confluence of technical and bureaucratic systems administered by experts in specific fields like "housing" or "highway transportation." The world was naturally disorganized, and it was the job of the planner to impose calm order by demolishing huge swaths of the city that were deemed unsalvageable and replacing them with simple, machine-like buildings and roadways that were easy to administer from atop a hierarchy. As Jacobs notes:

> It was possible not only to conceive of people, their incomes, their spending money and their housing as fundamentally problems in disorganized complexity, susceptible to conversion into problems of simplicity once ranges and averages were worked out, but also to conceive of city traffic, industry, parks, and even cultural facilities as components of disorganized complexity, convertible into problems of simplicity.

The newly professionalized discipline of urban planning had become what historian Peter Hall describes as "an apparently scientific activity, in which vast amounts of precise information were garnered and processed in such a way that the planner could devise very sensitive systems of guidance and control." This approach gave the world the high modernist architectural style of Le Corbusier and the ruthlessly technocratic urban redevelopment of Robert Moses, men whose sweeping highways and monolithic buildings all meant to bring a clean, straightforward rationality to dirty, chaotic cities. Their influence is still felt today in cookie-cutter suburbs serviced by highways and office parks accessible only by car or (as is increasingly the case for Silicon Valley companies) chartered buses.

Rationalization, as turn-of-the-century sociologist Max Weber defined it, is a matter of building bureaucracies to order everyday life with machine-like rules that can override the irrational traditionalism, sentimentality, and favoritism of humans. Formal rationality, despite its cold logic, could be deeply comforting: It promised nothing less than the end of poverty, if you could build enough super structures. But Moses's and Le Corbusier's modernist approach to urbanism is rationalization run amok. Not only did these projects require the destruction of many existing neighborhoods; they overestimated humans' ability to manage and ignored much of what makes for a pleasant human habitat.

Jacobs countered the command-and-control hierarchies of modernism with an argument in favor of small, self-organizing systems. She argued that human communities flourish best in places that are built out of a million layers of local history and complex social relations. This is so important to her theory of urbanism that she claims that "the most important question" about city planning is this: "How can cities generate

enough mixture among uses—enough diversity—throughout enough of their territories to sustain their own civilization?"

By "diversity," Jacobs means a mix of buildings, not necessarily people. A mixture of land uses, she argues, keeps social momentum going, allowing different components of the streetscape to be seen as supporting one another. Offices mingle with restaurants and apartments and bars, symbiotically sharing time and space to make a place feel full of life—a teeming human habitat in natural balance. This stands in contrast to rationalized, modernist landscapes, which evoke the single-mindedness of alienating bureaucracies and the profit-driven efficiencies of corporate capitalism. Whether it is office parks or residential towers, suburban ranch homes or strip malls, these buildings convey a limited sense of possibilities that often comes across as inauthentic—they are independent of and indifferent to their surrounding environment and thus could be replicated anywhere.

To counter rationalization and simplification, Jacobs and her countercultural followers embraced an ecological view of city systems and argued for their self-correcting nature. She railed against planners because she believed they were undermining the way we have governed each other (for better or worse) in cities for centuries. In a chapter on the uses of sidewalks, she writes:

> The public peace—the sidewalk and the street peace—of cities is not kept primarily by police … It is kept primarily by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves.

Like E.F. Schumacher, whose *Small Is Beautiful* (1973) has become a Silicon Valley touchstone, Jacobs advocates for the familiarity of seemingly self-managing systems, which she likens to "organisms that are replete with unexamined, but obviously intricately interconnected, and surely understandable, relationships." Designers should work within these supposedly organic systems and expand their reach rather than impose rules and systems from without, no matter how logically consistent the imposed rules may be in the abstract. In one of her last interviews—tellingly, with the libertarian magazine *Reason*—Jacobs said she was "disappointed" with the work of New Urbanists, an early 21st century movement that took her own work as gospel. Jacobs complained that they tried to plan out what could only organically grow over time.

But the very existence of New Urbanism shows how Jacobs's prescriptions are themselves subject to rationalization. Implemented at scale and under the logic of capital, they become as systematic and regimented as any modernist fantasy. Efforts to preserve and understand what makes organic neighborhoods so desirable also provides a template for making them more *valuable*, producing an irresistible model for capitalist redevelopment.

The views of Jacobs and Schumacher end up finding their apotheosis in things like social-media data science, which attempts to anticipate people's desires by unobtrusively parsing information collected about them, and transect-based coding, which urban planners and real estate developers use to identify and commodify a neighborhood's appeal.

In decades past, a suburb might have advertised itself as offering "authentic country living," which meant not the isolation and backwardness of country life but a manufactured ideal of "the country" involving detached houses and racial and socioeconomic homogeneity. Likewise cities and towns today sell a manufactured ideal of urban life that has more to do with standardized nostalgia than unpredictable street life.

The rationalized urban-nostalgia formula is epitomized by the first New Urbanist development, begun in 1981 with developer Robert Davis and architects Andres Duany and Elizabeth Plater-Zyberk. They wanted to build the quintessential seaside town on 80 acres of Florida panhandle, so they set out on an exhaustive survey that cataloged quaint Florida towns and, instead of designing actual buildings, wrote a code for building that developers would have to adhere to. Structures would have to look a certain way and connect to streets within given tolerances. What rose from the sand—simply named Seaside—was so uncanny in its quaint-

ness that it was used as the backdrop for *The Truman Show*.

Of course Rust Belt cities must renovate what they already have rather than build from scratch. But as with Seaside, any new construction in places committed to self-nostalgia will draw constricted "inspiration" from the surrounding architectural terroir. And whereas postwar suburbia was marketed through magazine ads and billboards seen from streetcars, small-city authenticity is now sold through geotagged photos and community hashtags, reinforced by how such tools themselves seem to leverage "organized complexity" to reflect a teeming organicism. Like Jacobs's idealized streetscape, social media can seem self-organized by the improvisations of users rather than an algorithmically planned community. In such marketing materials, authentic city life is reified in such symbolic commodities as the corporately managed industrial loft suites and the so-called Stealth Starbucks, in which the "inauthentic" national branding is disguised.

For the local elites poised to gain from rising rents and tax bases, "discovering" authentic urban charm and bringing it to market is an unmitigated good. For the people who built up a neighborhood's authenticity over the lean years, less so. As David Harvey explains in his 2012 book *Rebel Cities,*

> a community group that struggles to maintain ethnic diversity in its neighborhood and protect against gentrification may suddenly find its property prices (and taxes) rising as real estate agents market the "character" of their neighborhood to the wealthy as multicultural, street-lively, and diverse.

Jacobs may have been right about the sources of neighborhood vitality, but she seemed blind to what capitalists would eventually charge for it. Zukin argues that "Jacobs failed to look at how people use capital and culture to view, and to shape, the urban spaces they inhabit. She did not see that the authenticity she admired is itself a social product." As Harvey points out, "The better the common qualities a social group creates, the more likely it is to be raided and appropriated by private profit-maximizing interests."

Social media have only made the raiding parties easier to raise. They promise an urban lifestyle without the hassle of dealing with undesirable locals. Simply by owning a brownstone you are seemingly guaranteed a specific kind of iconic social life, regardless of whether you actually know your neighbors.

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For a place to truly become a consumer product, it must be not only subject to comparison shopping (for Troy, this is the image of the city as it circulates in social media) but also as convenient as possible to consume. That means moving has to be as easy as upgrading your smartphone. To consume the spectacle of our own lives in authentic urban environments—and be free to leave them when they become played out—we need to do away with much of our portable property: furniture, appliances, decor, keepsakes, and the like. We need to be ready to abandon any social ties that bind us to a place. We also need to be able to work wherever we move.

Offering pre-furnished apartments within an algorithmically populated neighborhood as an all-in-one consumer product would address all these problems, and a new crop of Silicon Valley companies hopes to provide just that. They have built what Ava Kofman has called venture capital communes, technologically sophisticated takes on the extended-stay hotel that give you a private bedroom within a building with well-appointed common kitchens and living spaces. Your housemates are pre-screened for their willingness to participate in community events like yoga.

WeWork, a purveyor of shared workspaces, has opened a brand extension called WeLive, a take on communal living modeled on these same principles. It aspires, as Kofman argues, to let customers "sign one membership agreement that allows them to seamlessly move between company-held buildings, and even cities, in the future."

By offering everything from stocked refrigerators to pre-organized potlucks, these

companies have captured, Kofman claims, "the other side of social media: how to monetize the emotional labor of everyday, non-digital life." Rather than monetize a picture of your dinner on Instagram by putting ads next to it, WeLive convenes a dinner table and makes those sitting at it serve as living advertisements for potential future neighbors.

WeLive posits a world where we can pick up and go with little concern for personal effects or relationships. This brings to vivid life Marx's claim that capitalism, in seeking to make labor as flexible and transferable as possible, makes workers doubly free: free from geographic ties and social station. At the same time, however, WeLive cuts against the modernist-style rationalized state that Weber presaged. It doesn't impose rules and laws from above to rein in disorganized complexity; instead it creates a domestic environment that is not unlike your Facebook Newsfeed: a disparate collection of people algorithmically arranged to find one another enjoyable and grow into a prefigured community.

The ideas propelling WeLive don't necessarily have to produce a neoliberal nightmare. In Ursula K. Le Guin's *The Dispossessed,* the people of the fictional anarchist society of Anarres moved freely from one pre-furnished dormitory to another according to a mixture of what society needed of them and what the individual wanted to do with their life. Early utopian city planners were similarly inspired by an ideal of a constantly learning, self-correcting resource-management system that could perfectly compensate all of a society's members. But those planners wanted a built environment that sanctified collectivity and democratic decision-making. WeLive rents a facsimile of it to only those that can afford it.

In the coming years, cities like Troy may be faced with uncanny replicas of themselves: too-perfect copies operating in closed circuits economically apart from the aging cities whose past they have appropriated. Perhaps some local elites will find a way to profit off this private commune system, but the cities themselves will yet again be left behind.

It would be a waste if Troy and cities like it were dismissed as exercises in cynical authenticity peddling. Bars dressed up like hardware stores may be a little on the nose, but they are owned by real people who speak of civic pride and a genuine desire to bring something back to a community they grew up in, or accepted them when others did not.

If such sentiments are sincere, then there is room for optimism: the possibility that organized complexity can be harnessed for collective good, not capitalist accumulation. The Jacobsonian project has to be socialized, the benefits of well-made places have to be shared within and among the communities that kept the lights on while everyone else was driving by.

The mechanisms to do this are not only known; they have been proved effective in the few places that have shown the political will to enact them. Land banks, truly cooperative housing development, and participatory budgeting are just a few of the tools that can help equitably distribute the gains of economic development. Such programs are not only morally just; they are most likely the only things standing in the way of a dismal history repeating itself.

What the next few years will deal to small cities is uncertain, but if a few people continue to extract rent from their finite resources of authenticity, then they will be right back where they started: abandoned by the fickle streams of economic activity that shift with the changing tide of whatever we consider worthy of attention.

Cut into the rotary-saw-blade sign in front of that bar in the old Trojan Hardware is the phrase "Stay Humble." It is unclear if that is directed at the patrons spending $13 on cocktails or all of Troy, and it's unclear whether anyone's heeding it.

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Originally published July 6, 2016
reallifemag.com/true-ish-grit

MAGNIFICENT DESOLATION

Spectacular mechanical feats beget spectacular mechanical failures

by ELISA GABBERT

Some months ago I saw a link on Twitter to a YouTube video that caught my attention. It was a computer-animated re-creation of the sinking of the *Titanic* in real time, all two hours and 40 minutes of it.

I did not watch the whole video, but I skipped around and watched parts, interested especially in the few interior views where you can watch the water level slowly rising at an angle in the white-painted hallways of the lower decks, and later, in the ballroom and grand staircase, as wicker chairs bob around.

The strangest thing about the video is that it includes no people—no cartoon passengers. There is no violin music, no voiceover. The ship is lit up, glowing yellow in the night, but the only sound, save for a few emergency flares and engine explosions, is of water sloshing into and against the ship. The overall impression is of near silence. It's almost soothing.

This is true until the last few minutes of the video, when the half-submerged ship begins to groan and finally cracks in half. Only then, as the lights go out and the steam funnels collapse, do you hear the sound of people screaming, which

"UNTITLED #6" (2009) FROM THE ROME SERIES BY LAURA LETINSKY. COURTESY OF THE ARTIST AND YANCEY RICHARDSON GALLERY.

continues for another half-minute after the ship has disappeared. A caption on the screen reads: "2:20—*Titanic* is gone. Rescue does not arrive for another hour and 40 minutes." A few (apparently empty) lifeboats are seen floating on the calm black ocean under a starry sky. Then, another caption: "2:21—*Titanic* is heard beneath the surface breaking apart and imploding as it falls to the seafloor." The video ends on this disturbing note, with no framing narrative creating a pseudo-happy ending.

I was suddenly obsessed with the story of the *Titanic*. I rewatched the James Cameron movie (still ridiculous, still gripping); I read a Beryl Bainbridge novel *(Every Man for Himself)* based on the night of the sinking; I read thousands of words on Wikipedia and what you might call fan sites, if you can be a fan of a disaster, reading lists of "facts" and conspiracy theories. I watched a documentary about a weird newish theory of the root cause of the disaster: One scientist thinks that a sudden and extreme drop in temperature caused a kind of mirage illusion on the horizon that obscured the iceberg from the men in the lookout until they were nearly upon it. The same illusion could, in theory, explain why a nearby ship (the S.S. *Californian*) did not clearly see that the Titanic was in danger. It is, of course, just a theory.

Even if you've read some history of the Titanic, even if you've never seen the movies, the Hollywood version of the narrative has a lot of pull—and that narrative puts the blame on hubris. Call it the Icarus interpretation: Blinded by a foolhardy overconfidence, we flew too close to the sun, melting our wings, et cetera. It's the easiest explanation, appealing in its simplicity, its mythic aura, and not without truth.

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WHEN I RAN OUT of freely available *Titanic* material, I moved to other disasters. I had a sudden overwhelming desire for disaster stories of a particular flavor: I wanted stories about great technological feats meeting their untimely doom. I felt addicted to disbelief—to the catharsis of reality denying my expectations, or verifying my worst fears, in spectacular fashion. The obvious next stop was 9/11.

9/11 is, so far, the singular disaster of my lifetime. People who were in New York City at the time always comment on how "beautiful" and "perfect" that September morning was, with "infinite visibility"—pilots call those conditions "severe clear." As I recall, it was a bright blue day in Houston too. I was driving from my apartment to the Rice University campus a couple of miles away when I heard the reports of a plane hitting one of the Twin Towers on the radio. I continued driving to school, parked my car in the stadium lot, and went into the student center, where a few people were watching the news on TV, with that air of disbelief that can appear almost casual.

The live footage of a massive steel skyscraper with smoke pluming out of a hole in its side was shocking, but I felt it dully; shock is marked by either incomprehension or denial. I don't remember truly feeling horror—that is, understanding—until people began to jump from the buildings. They were almost specks against the scale of the towers, filmed from a distance, but you knew what they were. They became known as the "jumpers": people trapped in the upper floors of the building, above the plane's impact and unable to get out, who were driven to such desperation from the extreme heat and lack of oxygen that they broke the thick windows with office furniture or anything else they could find and jumped to the pavement hundreds of stories below. Leslie E. Robertson, the lead structural engineer of the towers, later wrote that "the temperatures above the impact zones must have been unimaginable." Their bodies were heard landing by those nearby and those still in the buildings.

The jumpers' experience is exemplified by one Associated Press photo dubbed "The Falling Man." It depicts a man "falling," as if at ease, upside-down and in parallel with the vertical grid of the tower. (It's a trick of photography; other photos in the series show him tumbling haphazardly, out of control.) The photo was widely publicized at first, but met with vehement critique. It seems that some people found this particular

image too much to take, an insult to their senses. And though the jumps were witnessed by many, the New York City medical examiner's office classifies all deaths from the 9/11 attacks as homicides. Of course, they were forced, forced by suffering—but they were also voluntary. It seems akin to a prisoner held in solitary confinement or otherwise tortured killing themselves—murder by suicide.

When I think of the jumpers, I think of two things. I think of images of women covering their mouths—a pure expression of horror. They were caught on film, watching the towers from the streets of Manhattan. I do this sometimes—hand up, mouth open—when I see or read something horrible, even when alone. What is it for? I think, too, of the documentary about Philippe Petit, who tightrope-walked between the tops of the towers in 1974. At the time they were the second tallest buildings in the world, having just been surpassed by the Sears Tower in Chicago. It was an exceptionally windy day (it is always windy at 1,300 feet) and when a policeman threatened him from the roof of one building, Petit danced and pranced along the rope, to taunt him. This still seems to me like the most unthinkable thing a man has ever willingly done. The jumpers did what he did, but worse. Death was not a risk but a certainty; they jumped without thinking. It's more horrible to contemplate than many of the other deaths because we know the jumpers were tortured. Death is fathomable, but not torture.

A documentary on YouTube called *Inside the Twin Towers* provides a minute-by-minute account of the events on September 11, re-enacted by actors and intercut with interview footage from survivors. One man who managed to escape from the North Tower—he was four floors below the impact—recounts a moment when he opened a door and saw "the deepest, the richest black" he had ever seen. He called into it. Instead of continuing down the hall to see if anyone was there, he retreated back to his office in fear. He says in the film, "If I had gone down the hallway and died, it would have been better than living with this knowledge of, Hey, you know what, when it came right down to it, I was a coward. And it was actually our two co-workers down that hallway, on the other side, that ended up dying on that day. And I often think now, Perhaps I should have continued down that hallway."

This is a classic case of survivor's guilt, sometimes known as concentration-camp syndrome: the sense that your survival is a moral error. Theodor Adorno, in an amendment to his famous and somewhat misunderstood line about poetry after Auschwitz, wrote:

> Perennial suffering has as much right to expression as a tortured man has to scream; hence it may have been wrong to say that after Auschwitz you could no longer write poems. But it is not wrong to raise the less cultural question whether after Auschwitz you can go on living—especially whether one who escaped by accident, one who by rights should have been killed, may go on living. His mere survival calls for the coldness, the basic principle of bourgeois subjectivity, without which there could have been no Auschwitz; this is the drastic guilt of him who was spared. By way of atonement he will be plagued by dreams such as that he is no longer living at all.

It's terrifying, how quickly an ordered structure dissolves. Where does it all go?

This common syndrome, along with post-traumatic stress disorder, goes some way toward explaining why so many Holocaust survivors commit suicide.

There is survivor's guilt, but there is also survivor's elation, survivor's thrill—a thrill felt only by those a little farther from disaster. The September 24, 2001, issue of the *New Yorker* included a symposium of responses to the attacks. A few were able to acknowledge the element of thrill in our observation. Jonathan Franzen wrote:

> Unless you were a very good person indeed, you were probably, like me, experiencing the collision of several incompatible worlds inside your head. Besides the horror and sadness of what you were watching, you might also have felt a childish disappointment over the disruption of your day, or a selfish worry about the impact on your finances, or admiration for an attack so brilliantly conceived and so flawlessly executed, or, worst of all, an awed appreciation of the visual spectacle it produced.

I find Franzen's moral hierarchy here questionable, that "worst of all" most puzzling. Because to me, more than worry or admiration (!), the most natural and undeniable of reactions would seem to be awe.

It's the spectacle, I think, that makes a disaster a disaster. A disaster is not defined simply by damage or death count; deaths by smoking or car wrecks are not a disaster, because they are meted out, predictable. Nor are mass shootings generally considered disasters. A disaster must not only blindside us but be witnessed in public. The *Challenger* explosion killed only seven people, but like the *Titanic,* which killed more than 1,500, and like 9/11, which killed almost 3,000, the deaths were both highly publicized and completely unexpected.

All three incidents forced people to either watch or imagine huge man-made objects, monuments of engineering, fail catastrophically, being torn apart or exploding in the sky. These are events we rarely see except in movies. The destruction of the *Challenger* and the World Trade Center are now movies themselves, clips we can watch again and again. The proliferation of camera technology, including our cell-phone cameras, makes disaster easier to witness and to reproduce; it may even create a kind of cultural demand for disasters. Also on film are reaction shots: We get both the special effects and the human drama.

Roger Angell's version of survivor's thrill in the same issue is less chastising:

> When the second tower came down, you cried out once again, seeing it on the tube at home, and hurried out onto the street to watch the writhing fresh cloud lift above the buildings to the south, down at the bottom of this amazing and untouchable city, but you were not surprised, even amid such shock, by what you found in yourself next and saw in the faces around you—a bump of excitement, a secret momentary glow. Something is happening and I'm still here.

Angell, here, is saying this is not an aberration; it is the norm. It is one of the horrible parts of disaster, our complicity: the way we glamorize it and make it consumable; the way the news turns disasters into ready-made cinema; the way war movies, which mean to critique war, can only really glorify war. And we eat it up.

We don't talk about it now, but I always found the Twin Towers hideously ugly, in a way not explainable by their basic shape—they are long rectangular prisms, nothing more. Perhaps that was the problem. In the past, anything so large (the Eiffel Tower, the *Titanic*, the Empire State Building) had usually attempted to be beautiful and usually succeeded. These other structures still appear beautiful. How could anyone have ever found or ever in the future find the Twin Towers beautiful? They seem designed only to represent sturdiness, like campus buildings in the brutalist tradition that were mythologized to be "riot-proof."

A friend, a New Yorker, disagrees. She tells me the buildings "did amazing things with the light." Another, also from New York, says they were sexy at night. But all skyscrapers are sexy at night, from below if not from afar, by virtue of their sheer dizzying size, their sheer sheerness, sheer as in cliffs. They stand like massive shears, stabbed into the sky.

Despite their imposing, even ominous height, the towers fell in less than two hours; the

Titanic took only a little longer to sink. But that happened gradually. When you watch a building collapse, it seems like it suddenly *decides* to collapse. It's a building, and then, it's not a building, just a crumbling mass of debris. There seems to be no transition between cohesion and debris. It is terrifying, how quickly an ordered structure dissolves. Where does it all go? Buildings, like anything, are mostly empty space.

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In the vocabulary of disaster, one very important word is "debris," from the French *debriser*, to break down. A cherishable word, it sounds so light and delicate. But the World Trade Center produced hundreds of millions of tons of it. The bits of paper falling around the city led some people to mistake the initial hit for a parade.

In space flight, or even on high-speed jets, tiny bits of FOD, or "foreign object debris," can cause catastrophe. Space food is coated in gelatin to prevent crumbs, which in a weightless environment could work into vulnerable instruments or a pilot's eye. A small piece of metal on the runway could get sucked into a jet engine and cause it to fail.

The *Challenger* explosion, like the sinking of the *Titanic,* is usually chalked up to hubris. But if hubris is overconfidence, the explanation is unsatisfying. Engineers at NASA's Marshall Space Flight Center knew that the O-ring seals, which helped contain hot gases in the rocket boosters, were poorly designed and could fail under certain conditions, conditions that were present on the morning of the launch. The O-rings were designated as "Criticality 1," meaning their failure would have catastrophic results. But the engineers did not take action to ground all shuttle flights until the problem could be fixed. As the very first sentence in the official *Report of the Presidential Commission on the Space Shuttle Challenger Accident* puts it: "The Space Shuttle's Solid Rocket Booster problem began with the faulty design of its joint and increased as both NASA and contractor management first failed to recognize it as a problem, then failed to fix it and finally *treated it as an acceptable flight risk*" (italics mine).

What shocks me most when I read about the space program is the magnitude of the risks. The *Challenger* exploding on live TV in front of 17 percent of Americans was unthinkable to most of those viewers but not unthinkable to workers at NASA.

From what I understand, NASA has always embraced a culture of risk. In his memoir Spaceman, astronaut Mike Massimino, who flew on two missions to service and repair the Hubble telescope, recounts the atmosphere at NASA after the space shuttle *Columbia* broke up on reentry in 2003:

> When I walked in I saw Kevin Kregel in the hallway. He was standing there shaking his head. He looked up and saw me. "You know," he said, "we're all just playing Russian roulette, and you have to be grateful you weren't the one who got the bullet." I immediately thought about the two Columbia missions getting switched in the flight order, how it could have been us coming home that day. He was right. There was this tremendous grief and sadness, this devastated look on the faces of everyone who walked in. We'd lost seven members of our family. But underneath that sadness was a definite, and uncomfortable, sense of relief. That sounds perverse to say, but for some of us it's the way it was. Space travel is dangerous. People die. It had been 17 years since *Challenger.* We lost Apollo 1 on the launch pad 19 years before that. It was time for something to happen and, like Kevin said, you were grateful that your number hadn't come up.

In other words, the culture of risk at NASA is so great that in place of survivor's guilt there is only survivor's relief.

But knowing the risks and doing it anyway must entail some level of cognitive dissonance. This is apparent when Massimino writes that "like most accidents, *Columbia* was 100 percent preventable." This is hindsight bias; only past disasters are 100 percent preventable. The *Columbia* shuttle broke apart due to damage inflicted on the wing when a large chunk of foam insulation flew into it during launch. This was observed on film, and ground crew questioned whether it might have caused significant damage. However, the insulation regularly broke apart during launches and had never caused significant damage before. Further, NASA determined that even

if the spacecraft was damaged, which they had no way of verifying, there was nothing that the flight crew could do about it, so they didn't even inform them of the possibility of the problem.

When *Columbia* came apart during reentry, disintegrating and raining down parts like a meteor shower over Texas and Louisiana, an investigation was launched. At first, no one believed that the foam could have done enough damage to cause the accident. It was "lighter than air." As Massimino writes, "We looked at the shuttle hitting these bits of foam like an 18-wheeler hitting a Styrofoam cooler on the highway." Not until they actually reenacted the event by firing a chunk of foam at 500 miles per hour toward a salvaged wing and saw the results did they accept it as the cause of the disaster. Anything going that fast has tremendous force. This was not like the failure of the O-ring; the risks of the insulation were not understood. Or, more properly, they were simply not seen—it's basic, though unintuitive, physics. The same type of accident is 100 percent preventable now only because the disaster happened, triggering a shuttle redesign. When redesigns cost billions of dollars, if it isn't broke, they don't and probably can't fix it.

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The problem with the concept of hubris is that it lets us off too easy. It allows us to blame past versions of ourselves, past paradigms, for faulty thinking that we've since overcome. But these scientists we might scoff at now were incredibly smart and incredibly well-prepared. The number of things that *didn't* go wrong on numerous space missions is astounding. It's easy to blame people for not thinking of everything, but how *could* they think of everything? How can we?

Not knowing the unknowable isn't hubris. There is real danger in thinking, We were dumb then, but we're smart now. We *were* smart then, and we *are* dumb now—both are true. We do learn from the past, but we can't learn from disasters that do not yet have the capacity to happen. While disasters widen our sense of the scope of the possible, there are limits. We can't imagine all possible futures. Yet we call this hubris. Perhaps it's comforting to believe disasters are the result of some fixable "fatal flaw," and not an inevitable part of the unfolding of history.

To say there are limits to technological progress—we can't prepare ourselves completely for the unforeseen—is not to say progress is impossible, but that progress is tightly coupled with disaster. (As French cultural theorist Paul Virilio famously said, "The invention of the ship was also the invention of the shipwreck.") Not until we experience new forms of disaster can we understand what it is we need to prevent. If this is true, overreliance on the explanatory power of hubris is itself a form of hubris, a meta-hubris, since it assumes a position of superiority.

And can we, in any case, have progress without hubris pushing us forward with partial blinders? Don't we need hubris to enable and justify advances in technology? NASA seems to take hubris in stride; they see occasional disaster as the fair cost of spaceflight.

In his "Letter From a Birmingham Jail," Martin Luther King Jr. warned of "the strangely irrational notion that there is something in the very flow of time that will inevitably cure all ills." You could say the same of technological progress; it is tempting to believe that progress occurs on a linear curve, such that eventually all problems will be solved, and all accidents will be completely preventable. But there's no reason to assume the curve of progress is linear, that the climb is ever increasing.

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I want to come back to the *Titanic,* and some common misconceptions. One is that there were not enough lifeboats on board for frivolous reasons—because proprietors felt they would look unattractive on deck, or because they were regarded as mere symbols, serving only to comfort nervous passengers on a ship designers believed was literally unsinkable. This isn't the case. Rather, the thinking at the time was that the safest method of rescue, in the event of an emergency, was to ferry passengers back and forth between the sinking ship and a rescue ship. Because the *Titanic* would

sink slowly, if at all, for some time it would actually be safer on the ship than in a lifeboat. Therefore the lifeboats didn't need to accommodate the entire capacity of the ship in one go.

So why did the *Titanic* sink so fast? The surprising truth is that if the ship had hit the iceberg head on, instead of narrowly missing it at the stern and then scraping along its side, it would not have sunk. The ship was capable of sustaining huge amounts of damage from an impact like an iceberg—it could stay afloat if four of its 16 watertight bulkheads were flooded. But the iceberg tore into the ship in such a way that five compartments were damaged. This event was not, realistically, foreseeable; no iceberg in history had done that kind of damage to a ship, and none has done that kind of damage since. It was, in essence, a freak accident.

There are echoes of this in the World Trade Center's collapse. It's well known that the buildings were designed to survive the impact of an airplane. However, they were envisioning outcomes like a small, slow-flying plane hitting a tower by accident—in fact, a bomber flying in near-zero visibility had hit the Empire State Building in 1945—not a modern jet being flown purposely into the tower at top speed. Still, there was a false sense of security. After the first impact, the PA system in the building told people to remain at their desks when of course they should have been evacuating. Some building staff also told workers it would be safer to stay where they were.

Is this hubris, or something else? Disasters always feel like something that happens in the past. We want to believe that better technology, better engineering will save us. The more information we have, the safer we can make our technology. But though it's hard to accept, we can never have all the information. In creating new technology to address known problems, we unavoidably create new problems, new unknowns. Progress changes the parameters of possibility if it changes anything at all. In fact, this is something we strive for—to innovate past the event horizon of what we can imagine. Hubris feeds on itself, is self-sustaining. And with so much that is inaccessible, unknowable, and changing all the time, we can't even hold on to what we already know.

As they stepped out of the lunar module and began their moon walk, Neil Armstrong said to Buzz Aldrin, "Isn't that something! Magnificent sight out there." Aldrin's cryptic, poetic response was "Magnificent desolation." I think of this quote when I see footage of disasters. Especially after years of buffer, years of familiarity, have lessened the sting, it's easy to see these events as, in their way, magnificent. Magnificent creations beget magnificent failures. It is awesome that we built them; it was awesome when they fell. Horror and awe are not incompatible; they are intertwined.

Is it perversity or courage that allows some people to admit to survivor's thrill? On the afternoon of September 11, I remember meeting my then-boyfriend on campus for lunch. He was a contrarian type, but nonetheless his reaction disturbed me—he was visibly giddy, buzzed by the news. It's not that I don't believe others were excited, but no one else had revealed it. In 2005, before the levees had broken in New Orleans, my roommate asked if I wasn't just a little bit disappointed that Katrina hadn't turned out as bad as predicted. Just hours later she regretted saying it.

Often, when something bad happens, I have a strange instinctual desire for things to get even worse—I think of a terrible outcome and then wish for it. I recognize the pattern, but I don't understand it. It's as though my mind is running simulations and can't help but prefer the most dramatic option—as though, in that eventuality, I could enjoy it from the outside. Of course, my rational mind knows better; it knows I don't want what I want. Still, I fear this part of me, the small but undeniable pull of disaster. It's something we all must have inside us. Who can say it doesn't have influence? This secret wish for the blowout ending?

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Originally published on Nov. 28, 2016
reallifemag.com/magnificient-desolation

PERPETUAL MOTION MACHINES

IMAGE: FROM DESERT REALITY BY ED FREEMAN.

Driverless cars won't be a new form of transportation but the end of it

by CHENOE HART

THE VIDEO THAT introduces Nissan's IDS automated concept car resembles any other car commercial: vaguely propulsive background music, tracking footage shot from a helicopter sweeping over a city, a handsome man behind the wheel. Then, as the narrator promises that Nissan's technology will make driving more "enjoyable" by allowing computers to take over during moments of heavy traffic, the car's manual controls vanish beneath an elaborate folding-panel system. The driver role is replaced with the equally familiar role of passenger, gazing contemplatively at the passing scenery of the same conventional streets and bridges and office buildings that would be visible today.

But new technologies may ultimately evolve far beyond machines "automating" the recognizably human task of driving. Hypotheses about "driverless" cars still presume there will be such a thing as drivers and passengers,

trapping us within the current incarnation of our transportation system. Frequently applied terms like "automated" and "driverless" are inadequate in that they continue to posit manually piloted vehicles as the norm from which the new technologies deviate. Rather than robot drivers piloting cars that humans might otherwise be driving, these new technologies may transport us in an entirely different way that dispenses with accommodating human capabilities.

While attempting to describe an upcoming future that we do not yet understand, predictions like those in Nissan's IDS video remain burdened with obsolete concepts. It is telling that Nissan's concept car and the vehicles imagined by Volvo and IDEO retain familiar characteristics of gasoline-powered cars. They have a hood and front grille as ornamentation, for instance, even after their electrical propulsion mechanisms have rendered them nonfunctional. The electric drivetrain of Tesla's Model S makes the front hood vestigial; the company's nickname for that anachronistic space where the engine once was—a "frunk," or front trunk—embodies the awkwardness of adapting new designs to our current expectations.

Once designers of automated vehicles are no longer bound by the outdated limitations of accommodating either internal combustion technology or human operators, they could move far beyond our present-day intuitions of what a car should look like. Replacing bulky gasoline engines and transmissions with multiple smaller electric motors and slim under-floor battery packs would enable radical new possibilities for the configuration of interior space. As early as 2002, GM's Hy-Wire concept car separated an interchangeable passenger compartment from its fuel cell and electric motor powertrains, opening up space for an interior that more closely resembled a living room than conventional expectations of passenger-car seating. Where one would expect to see a hood and dashboard, the windshield extended to become a panoramic window framing the road ahead as a scenic view.

The Hy-Wire's technology suggests that the focus of car design could turn inward, yielding a range of new possibilities for vehicle interiors. Our future passenger experience might bear little resemblance to either driving or riding within a vehicle; we'll inhabit a space that only coincidentally happens to be in motion.

With a system of automated vehicles, transit passengers will no longer need to pay any attention while distances are being traversed. With the possibility of traffic collisions theoretically eliminated, safety requirements mandating fixed seats, air bags, and seat belts would become obsolete. Passengers who no longer needed to be restrained would be able to move around freely. After ease of handling becomes an irrelevant design consideration for new vehicles steered by computers, designers will be free to stretch wheelbases, raise ceiling heights, and specify softer suspensions to make that movement more natural and comfortable. And since the people inside wouldn't necessarily need to see where they were going, a growing range of possible wall fixtures—storage cabinets, LCD screens, perhaps a kitchen sink—could substitute passenger convenience over views of the world outside. The elimination of the driver will mean the end of the car as a car.

Our experience will bear little resemblance to driving. We'll inhabit space that only coincidentally is in motion

The social impact could be broader than we

expect. When we don't have to look where we are going, we have to deliberately choose what we want to see. One of IDEO's more radical visions of how automated vehicles could be used, the WorkOnWheels mobile office, is designed to allow employees to travel to new locations as they work. The pod contains office furniture and pull-down shades over the windows, letting workers choose which aspects of their surrounding environment they want to see, without having to visually process the travel in-between. Cityscapes become optional, consumable on demand rather than by necessity. Meanwhile, the mobile workplace's controlled internal habitat would remain constant no matter where it was.

Such a vehicle would not have to travel any faster for us to perceive a dramatic reduction in travel time. The time once spent in vehicles inertly waiting to arrive could now be filled with the same sort of activities we'd be doing if we were already there—or had never left.

The opportunity to multitask while traveling could make the journey into the destination. Given the expanded possibilities of what one could do inside a vehicle, our existing distinctions between vehicles and buildings, between transit and destination, between static and mobile spaces, may begin to blur. Imagine commuting while sleeping, or socializing at happy hour while the bar transports you home. Imagine if a garage was also the car. If commuting entails being in a space that is functionally equivalent to being at home, one might eventually skip returning home, and commute perpetually. The journey to work could commence as soon we fall asleep. The idea of having a destination becomes as obsolete as drivers and cars. Highways would host listless roaming bedrooms, meandering through the night.

Our understanding of a house as a stable locus of physical and emotional shelter could become diluted. There would be no reason for homes to not also be vehicles. A range of new options for customizing these vehicle-home hybrids would emerge: Homes could be made up of modular docking pods, and specific rooms could be shared, swapped, rented out, or sent away for cleaning or restocking. Modern conveniences that we currently take for granted—such as being able to use a bathroom without needing to arrange for its presence in advance—could become tomorrow's luxuries. The homeless would be the only people not constantly in motion, the people closest to retaining a fixed physical location called home. Stasis would become homelessness.

If vehicular interiors can accommodate the activities possible at most destinations—if the vehicle becomes a destination in and of itself, and destinations become other vehicles—the mediating experience of a journey between places would be eliminated. There will be no signs to point us anywhere. There would be no need to know directions, and no sense of what being "on the way" to somewhere looks or feels like. There will be no need to know how to get anywhere once we forget the concept of having anywhere to go.

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Driverless cars will not be the first transit technology to challenge our conceptions of time and space. The travel speeds of the first railroads were unprecedented, surpassing the contemporary ability to perceive the distance between destinations. Train routes became abstractions, navigated by means of timetables rather than maps. Eventually, transit system diagrams, like the iconic Vignelli New York City subway map, eliminated realistic representations of geography. Mass-market novels grew in popularity as a way for riders to pass the time while their capacity to comprehend or influence the direction of their journey was suspended.

Geographic proximity became less relevant than whether or not the destination was connected to the transportation network. Early transit-oriented developments, such as theme parks and department stores, were built by railroad interests to take advantage of the audiences captive within their systems. Growing suburban commuter towns expanded to the limit of convenient walking distance from a train station; areas beyond that boundary remained rural.

At the same time railroads were offering passengers prescribed choices between linear routes, other technologies were bringing a wider scope of self-directed travel to many consumers. The growing popularity of early bicycles was met with a moral panic over whether they would allow female riders the freedom to travel unsupervised and mingle with members of the opposite sex. While exploratory automotive road trips are now romanticized as integral to American culture, a continuing reminder of the bicycle's early reception can be seen in Saudi Arabia's laws prohibiting women from either driving cars or riding bikes.

The user interface for navigation would no longer be a map, but a clock or calendar. Place would be synonymous with occasion, and more closely resemble verbs than nouns

External rules can always be imposed to limit the freedoms that might seem innately afforded by transportation technologies. Driverless cars would seem to retain the automobile's capability to allow passengers free individualized movement, but their software may introduce new avenues for regulatory control over those movements. Physical impediments like gates and cul-de-sacs would become less relevant compared with restrictions or service fees implemented at the level of code. People and buildings in different service networks might pass each other by without experiencing the slightest hint of one another. And a software error could make certain places impossible to access even as you go right through them. It may require special attention for passengers to know what choices they actually have over their journeys, what potential detours they might be missing. Passengers content to surrender responsibility over their journeys could find themselves back on de facto railroad tracks.

A "driverless car" could become conceptualized as a horizontal elevator. After an elevator's initial acceleration, the difference in time between reaching higher and lower floors is minimal. Traveling between buildings could become closer to traveling between different floors in the same building, and with no greater awareness of the other numbered floors or buildings blinking past in between. Destinations become equally accessible entries in an arbitrary numeric index, with the differences in access time reminiscent of the slight delays in retrieving digital information from a mechanical hard drive.

The user interface for navigation would no longer be a map, but a clock or calendar. Place would be synonymous with occasion

It should be no surprise that Google, a technology company focused on information retrieval, has been the first to replace the analog interface of a steering wheel with the binary option of a single push button. Our wider urban environment could become randomly accessible in the same way that Amazon's "Chaotic Storage" warehouses already organize their contents, independent of any traditional spatial categorization scheme.

Maps would no longer be relevant outside the internal processes of a vehicle's guidance computer. If one sought, say, the nearest coffee shop, it would not have to be a question of geography. The desire for coffee wouldn't be a matter of a destination or a journey. Behind the scenes, software would instruct a vehicle to take its passenger to a nearby coffee shop, or it could summon a mobile coffee shop toward

the customer. There would be no trip to a fixed location, only trajectories calculated dynamically to unite the various moving parties to facilitate an exchange. The divergent aims and cross-purposes of individual drivers pursuing their goals would be subsumed by a swarm of vehicle-buildings coordinated across a shared network, moving collectively in fluid patterns. Extrapolate this principle, and one can see how dispersed low-rise communities of mobile buildings might replace fixed, vertically oriented cities.

Once physical locations are rendered as abstract coordinates in a user interface, they effectively become arbitrary, as interchangeable as the retail spaces of big-box stores. The experience of inhabiting any particular interior space might become decoupled from its existence within a specific place, free from the baggage of associated historical and geographic context. Real estate would no longer need to be valued according to its location, because proximity would always be subject to change. Travel to visit or inhabit buildings still standing in fixed physical locations might join horses and antique cars as nostalgic hobbies for the wealthy.

Our memories of the spatial processions encountered while traveling through urban architecture—approaching the public facade of a building, the transition between the street and lobby, the awareness of landmark reference points on a skyline, the interstices between buildings—might eventually begin to fade. The experience of passing from one destination to another could become akin to watching the progress bar of a software download. Traveling to a different location, or having that location travel to you, would be more akin to updating an app.

The user interface for navigating space would no longer be a map, but a clock or calendar. Distances once traced on a map would be transmuted into blocks of time plotted on one's daily schedule. Place would be synonymous with occasion, with movement through time corresponding to automatic movements through space. Frequent destinations such as "home" and "work" might transform into abstract zones differentiated mainly by when rather than where they happen. Our motives and desires would be foregrounded over the experience of traveling, shifting our conception of destinations to more closely resemble verbs rather than nouns. Your workout routine might take place in a different gym than it did the morning before, but you wouldn't know the difference; they would be identically convenient. As soon as our scheduled time within one destination expired, we would be able to walk through a docking port into the next, like a cinematic cut skipping the passage of mundane events that might otherwise have unfolded between selected scenes.

Driverless passenger cars and delivery vehicles will further accelerate our current move to on-demand services that let us bypass those inconvenient interstitial moments of everyday life—walking to a store, standing in line, cooking a meal, and so on. The logistics of scheduling automated vehicles will ensure that even more of our time becomes consciously programmed and structured, optimized for maximum productivity. With each advance, our surrounding environment will become increasingly hostile to serendipity and chance meetings, known sources of creative breakthroughs.

Contemporary urban-planning guidelines are based on assumptions that the rich pedestrian life of a street or a park emerges from adjacencies with surrounding businesses. Driverless cars posit a possible future without street life and without spaces for spontaneity. As with previous planning mistakes in developing automotive-oriented cities, carmakers and technology companies are moving forward with their ideas without reckoning with the full range of potential social impacts. These futures must be imagined before they can be embraced or resisted. Otherwise driverless cars may steer society into a blind cul-de-sac, and we will discover we have nowhere left to go.

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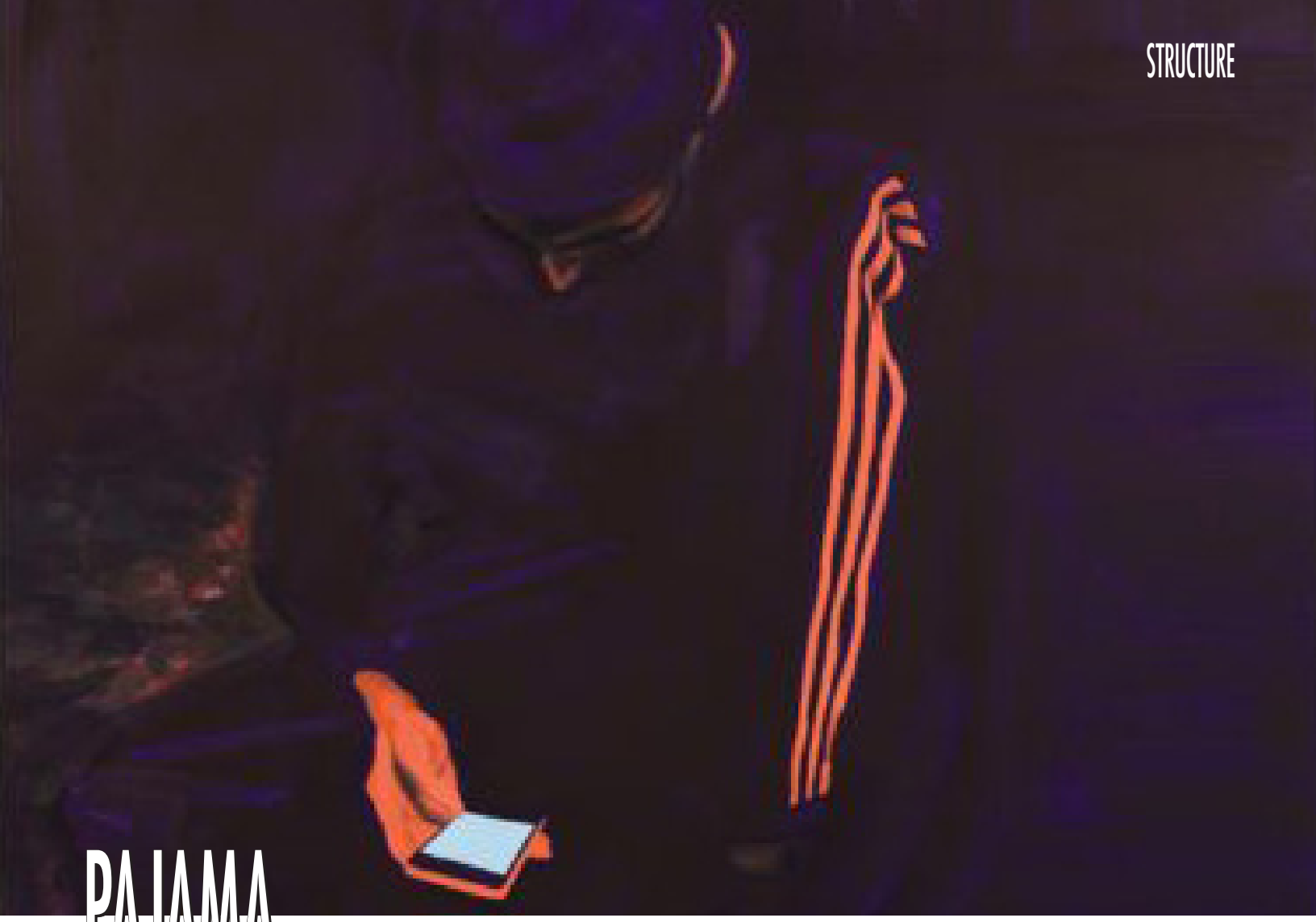
Originally published on Aug. 31, 2016
reallifemag.com/perpetual-motion-machines



PAJAMA RICH

If it's unclear whether you're working out, working at home, or working at all, then chances are you're wearing athleisure

by MOIRA WEIGEL

"I'm pajama rich," Kanye rapped in 2010. But, by then, you didn't have to be rich to spend your days in clothes you could have slept in. Among young, female professionals, Lululemon and its imitators were taking over. Even debt-ridden students and freelancers—or especially students and freelancers—were dressing as if they might at any minute hit the sack or hit the gym. And why not? It wasn't as if we had fixed schedules.

The size of the market for athleisure—a coinage officially adopted into Merriam-Webster's lexicon this April—grew five percent each year between 2009 and 2014, from $54 billion to $68 billion. The trend accounted for nearly all growth in the apparel, footwear, and accessories sector during this period. People in American cities were wearing Lululemon, Lucy, and Lorna Jane; Gap Body, Athleta, and Nike everywhere, including to the office. According to a February article in the *New York Times,* the market may hit $100 billion by the end of 2016. Meanwhile, sales of jeans fell six percent in 2014 alone—the most precipitous drop in more than 30 years. One *Business Insider* article called it the "Denim Apocalypse."

"NIGHT TEXTER (VIOLET OLIVER)," BY SAM MCKINNISS. COURTESY OF THE ARTIST AND TEAM GALLERY.

Why have fancy workout clothes become the uniform of so many American women? Marshal Cohen, the chief apparel analyst for the market-research firm NPD Group has told reporter after reporter that the reasons are straightforward: The clothes are "comfortable" and suit "a fitness-conscious lifestyle." But for many wearers, the athletic part of athleisure remains aspirational: Sales of yoga clothes increased 10 times as much as participation in yoga classes over the 2009 to 2014 span, according to the *Wall Street Journal*. Comfort is not a constant either. As Lululemon founder Chip Wilson infamously said on Bloomberg Television, "Some women's bodies just actually don't work in the pants."

It is not simply ease or convenience that puts women in athleisure. The look physically connects us to an ideal. Social psychologists have coined the expression "enclothed cognition" to describe "the systematic influence that clothes have on a wearer's psychological process." For instance, a test subject wearing a lab coat becomes more attentive to details than someone not wearing a lab coat. Another experiment found that test subjects wearing what they were told was a "doctor's coat" did the same, but those wearing an identical garment they had been told was a "painter's coat" became less attentive.

Simply looking at a lab coat while performing the task had no effect.

The researchers concluded that enclothed cognition derived from two sources: the "physical experience" of wearing a garment and its "symbolic meaning." Athleisure is trending because it offers a distinctive physical feeling that corresponds to how we are expected to feel about work in an era when "do what you love" is the conventional wisdom about careers. Lululemons announce that for their wearer, life has become frictionless. It clothes us in an ideal that merges work and play to the point where they become indistinguishable, and effort feels like pleasure.

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For me, it started with a Spanx. It was the summer of 2009. I was in Minnesota, on the eve of a family wedding, and feeling unsure about my outfit.

"You have a waist from another era," the saleslady back in New York had gushed, flattering me, when I tried on the high-waisted skirt I was planning to wear. But did I, really? What did that even mean? In the clear light of the Midwest, it looked like an optical illusion, produced by other bulges that the skirt exposed.

My mother pulled a flesh-colored something out of her suitcase that, she laughed, she had to "sausage herself into."

"Spanx," she explained.

The next morning I convinced one of my aunts to drive me to Dayton's. The knockoff I bought fit me like a glove, but more closely than any glove I ever wore.

That night, my cousin was married, and I drank too much and danced too closely with a stranger I kept calling "Mike," even though I knew he was called Alex. For some reason, in that state, the idea of not being able to remember the name this confident young man kept repeating struck me as funny.

As we swayed, hip to hip, I felt the cling that I now feel in most of my clothing. Held and exposed. Smoothed and protected. The sense of touch is notoriously difficult to describe—hence, begging-the-question words like *mouthfeel*. But the word for how my casing made me feel was *optimized*. I was the best lonely girl at a wedding I could be.

The physical sensation of Spanx comes from Lycra, which is another name for spandex. Like many technologies—the internet, for instance—it was a by-product of research funded by the U.S. Army in the middle of the last century. During World War II, chemists at Dupont (itself originally a gunpowder manufacturer) developed rubber-based polymers that could be used to make parachutes capable of resisting rain and heat. After the war, a chemist named Joseph Shivers found that when he took out the rubber, he could make fibers that stretched up to five times their length without losing shape. By 1962, Dupont had commercialized it under the name Fiber K,

and soon manufacturers were buying miles of it to make into sportswear and girdles, swimsuits and hosiery. By 1990, spandex was one of the most profitable divisions at the company.

Maybe two years after my cousin's wedding, my friend Mal told me about Lululemons. We were taking a yoga class at the studio she went to. I have never managed to stick with yoga for the same reason I probably should: I get too impatient. But I still wear Lululemons almost every day.

Spanx and Lululemons share a chemical formula; the spandex they both use offers flexibility to the point of being indestructible. It also embodies the dual nature of that flexibility. Spandex is an anagram of "expands," but as much as its fibers *stretch,* they also *compress.* They offer a kind of comfort, but on the condition that you submit to having your body shaped. Rather, they ask you to commit to shaping it in a certain way.

While Spanx are a secret weapon for managing intractable body parts, Lulus put that effort on proud display, announcing that their wearer is eager to be seen as engaging in constant self-management—toning her ass and thighs and balancing work with "life." As the "embodied cognition" people might put it, yoga pants let the entire body *think* that aspiration.

As the Lululemons symbolize aspiration, the spandex enforces the discipline needed to achieve it. Offering convenience, the pants also nag us to exercise. Self-exposure and self-policing meet in a feedback loop. Because these pants only "work" on a certain kind of body, wearing them reminds you to go out and get that body. They encourage you to produce yourself as the body that they ideally display.

Lululemons suggest an unfussy attitude ("Oh these? These are just gym clothes!"). At the same time, they telegraph that their wearer is driven. "I am dedicated to fitness," they say, "and I have no time to change." Yet, wearing these pants at midday hints that you have a flexible schedule. You do not have to go into a traditional office. Or, if you do, you do not feel any pressure to impress. You just might step out for a spinning class or a green juice.

In other words, Lululemons convey status. Like spending a fortune on nutrition, facials, and skin cream so that you can boast that you "only wear lip gloss," wearing these pants is a form of inconspicuous consumption—particularly when you pair them, as so many women do, with an expensive handbag. In their conspicuous inconspicuousness, as well as their homogeneity, Lululemons recall the "normcore" trend of several years ago. They share the pretense of democratic-ness but leave out the irony. Athleisure humble-brags.

All over San Francisco, I see evidence that the Lululemon class has sexualized the pain involved in becoming your fittest self. The other day I saw a $60 T-shirt for sale on Polk Street. The front read: BARRE WHORE

BEFORE ATHLEISURE, Americans wore denim. Like spandex, denim was said to be comfortable. Like Lululemons, blue jeans crossed boundaries between work and play. Unlike athleisure, however, jeans were first made for men.

Levi Strauss, an immigrant from Bavaria who landed in San Francisco, is credited with being the first manufacturer of modern jeans. In 1873, with a tailor, he filed a patent for a denim pant with "rivets sewn in at the points of strain"—the pockets, crotch, and hip. The goal was to make pants you could wear for years—on horseback and into gold mines or, less romantically, for any sort of manual labor—without ripping them.

Jeans remained working clothes worn by factory hands until around the beginning of World War II, when the uniform was reinvented as an image. When director John Ford put John Wayne in jeans in the 1939 movie Stagecoach, it was to symbolize not drudgery, but freedom through hardship—and the kind of manliness that was supposed to have flourished there in the absence of women. (In the 1870s there were 100 men for every 38 women in California, and the gender ratio would not reach parity until 1950.)

Already in the 1880s, Walt Whitman made fun of the "down-town clerks" he saw flooding in and out of the office buildings of lower Manhat-

tan. They were "a slender and round-shouldered generation, of minute leg, chalky face, and hollow chest." Their clothes were especially embarrassing. They looked "trig and prim in great glow of shiny boots, clean shirts … tight pantaloons, straps, which seem coming into little fashion again, startling cravats, and hair all soaked and slickery with sickening oils."

As Western wear, jeans represented a rejection of this white-collar emasculation. Levi's promised that America was still a place where you could get by on your wits and that if you took risks you could turn dirt to gold. Lady Luck might favor anyone on the frontier—any white man, that is. If jeans were the sartorial symbol of equal opportunity, the democratized work wear of self-made men, racism always tainted their American dream of transcending class. Nineteenth-century satirists mocked the Chinese laborers who came to San Francisco for wearing black pajamas. The Apaches that John Wayne kills sport leather chaps.

Fashions changed, but the idea that white-collar work made men effeminate persisted. In the 1950s and 1960s, a growing literature on male malaise—from *The Man in the Gray Flannel Suit* to *Revolutionary Road*—attested that the kind of bootlicking required to hold down a salaried job was the opposite of independence. You put up with these humiliations only in order to support your wife and kids. Wearing jeans would never fly with a white-collar boss. A man in jeans thus revolted against domesticity and its demands. On Marlon Brando, James Dean and Elvis, jeans became that paradoxical thing: a uniform of rebellion. As fetishized consumer goods, they became part of the consumer economy—traditionally the domain of housewives and households—even as they symbolized the desire to escape it.

In this same era, women put on jeans to play with the gender expectations men hoped to shore up. A woman in denim seemed slightly cross-dressed; jeans looked like a kind of jaunty drag. Consider Marilyn Monroe in her second-to-last movie, *The Misfits* (1961), a Western about the end of the Western. Just as the film's dramatic tension comes from her being unsuited for the cowboy life, the frisson of her look comes from how it combines her hyper-feminine body with manly roughness.

But the ideal female body changes as the needs of capitalism change. The full figure that Marilyn's jeans hugged broadcast softness and fertility, a person who lived to consume and breed. The shrinking bodies of the 1970s and 1980s suggested a different aspiration: to combine the fragility associated with being female with the drive and self-control required to build a career.

Historically, in western culture, women have been seen as playing the body to the male mind. But the first generation of calorie-counting career girls hoped that they could overcome this history. *Get you a body that can do both.* Women's jeans became a fixture in this period because they suited these aspirations and the idealized body that emerged with them.

The new physique expressed the contradictory values of female passivity and masculine ambition. Jeans were ostensibly androgynous garments. This made them particularly well suited for articulating actual gender difference. The 1992 Calvin Klein spreads featuring Mark Wahlberg and Kate Moss highlighted how the ideals of male strength and female fragility could persist even in a presumably equal-opportunity world. The look synthesized them. Because for the vast majority of women, it would take superhero willpower to stay that thin, especially if you were also busy climbing a corporate ladder. The jeans never fit.

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Of course, you don't need to tell any woman who has ever shopped for jeans that they were not made for us. Over the past decade, we may have finally left them behind. This is our progress: In the era of Sheryl Sandberg and Hillary Clinton, we no longer live in thrall to Kate Moss waifishness. In form and in function, athleisure celebrates strong women. It was as if clothes that could stretch to fit a female figure could also make the boundaries between public and private space—between the spheres traditionally

understood as male and female, as for work and for sex—more elastic.

American Apparel was the transitional brand. The porny tableaux of lithe young women in monochrome basics that started to crop up on billboards and buses from Brooklyn to Berlin were like Calvin Klein campaigns reshot as sexts. The fact that the models looked like amateurs was precisely what made them titillating. As a dude at a grad school party once put it, "An American Apparel ad promises you could get fucked anywhere. You could get fucked in your youth hostel. You could get fucked at the laundromat." (When I told him later that I was wearing an American Apparel dress, he waved my embarrassment aside, saying, "I knew that.")

Next came jeggings—the denim-spandex blend that became popular as American Apparel crashed and burned—and then athleisure, which took the process of "liberating" the female figure from the ill-fitting stiffness of denim to its conclusion. But this liberation is conditional. It retains the superwoman work ethic. A woman dressed in Lululemons looks like she is ready to scream with enthusiasm through a punishing exercise class and then hurry back to the office.

Even as athleisure liberates us from earlier, gender-bound modes of dress they enforce a new code of the body as a constant work in progress. The ideal contemporary subject is a person who is willing to spend all her time being productive. You have to work hard to afford Barre or spin or yoga; at the same time, these efforts energize you to return to work.

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In the heyday of John Wayne jeans, the break between work and not-work was clear. Men who worked from 9 to 5 could put on jeans afterward to symbolize rebellion or, at least, their need for respite. It recharged them to return to the office the next day.

In the era of athleisure, time is more ambiguous. When the workday starts or ends, and where work happens, have become less clear. At the same time, selfhood has become an entrepreneurial project, a question of optimizing different activities. The ideal worker in this new regime is female. It is not just that women are more experienced with the kinds of service work and image and emotional work that have largely replaced manual and factory labor in the developed world. It is that women are more accustomed to balancing multiple kinds of demands.

The ideal worker in in the era of athleisure is female. Women are more accustomed to balancing multiple kinds of demands

In April, Beyoncé released a video to announce the release of her new athleisure line, Ivy Park. In it, she delivers a monologue over a montage of her exercise routine,explaining that the brand name comes from the park where her father used to make her exercise every morning as a child. "I remember wanting to stop, but I would push myself to keep going," she says. "It taught me discipline." Of course, the Ivy part comes from the name of her daughter.

In the voiceover, Beyoncé demonstrates how she shifts easily between public and private mode, between the work of work and the work of life: "There are things I'm still afraid of. When I have to conquer those things, I go back to that park. Before I hit the stage, I went back

to that park. When it was time for me to give birth, I went back to that park." The video cuts to an image of her giving Blue Ivy a piggyback ride. It's a typically understated rebuttal to the haters who say that Beyoncé did not gestate her child. But it also suggests that the drive her father instilled in her applies equally to her work as a pop star and to the private tasks of being a mother. To compete at the top, the empowered woman must be willing to work anytime and anywhere.

"The park became my strength," Beyoncé concludes. "The park became a state of mind. Where's your park?"

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If the default gender of athleisure is female, men seem to know what is up. "You're in spandex country now," an Uber driver crowed to my sister as he dropped her off in the Marina neighborhood of San Francisco recently. "You bring your stretchy pants?" I have heard more than one man refer to Lululemons as "those pants that make every girl's ass look good." I meet a petite philosophy professor who tells me about going on a few dates with a man who asked her to start wearing Lululemons, for this reason, on date three.

The past 10 years have seen a resurgence of the ass as the key femme trait. If "Baby Got Back" came out now, it would make no sense: No magazine is telling anyone that flat butts are the thing. On the contrary: Blake Lively is quoting Sir Mix-A-Lot re: her own ass, on the red carpet at the Oscars: "LA face and an Oakland booty," she posted on Instagram. Sir Mix-A-Lot defended her against those who criticized the post for being racially insensitive. ("I checked it out, and looked at it and I was kind of … I liked it. You know I like stuff like that," he told the *Hollywood Reporter.*) "Booty celebrity" Jen Selter has earned 9.5 million followers by posting photos of her posterior. Most show her doing squats in the garment best suited to showcase them: athleisure leggings.

To look at Beyoncé after looking at, say, Kate Moss gives one hope that our culture is embracing a wider array of body types and sex symbols than it once did—and giving women more latitude in the process. The figures of Beyoncé, Nicki Minaj, and Kim Kardashian no longer look as starved as those of Calvin Klein models. Nonetheless, they too demand discipline to maintain. A new generation of strong women are still being encouraged to direct their energies inward, to transform their bodies into fetishes. Beyoncé says she exercises two hours per day. Jennifer Lopez—whose private trainer told the press that he has never met anyone who works so hard—took out insurance on her ass. We can have a range of female bodies, so long as they are all commodities.

And, of course, so long as they are firmly located on one side of a cisgender binary. While I am writing this essay, Facebook starts showing me ads for Lululemon for men. Ironically, these ads describe the project of getting a man into exercise clothes as one more thing for women to do. The man in the ad that I see most often looks like Chris Hemsworth. In him, a Mark Wahlberg build meets long gold hair. If *The Misfits* posed the Woman in Jeans as a kind of drag performer, this guy is a gender-flipped Marilyn, the man who can be dragooned into buying outrageously expensive pants to maintain himself.

"We'll help you help him," the ad reads. "Our shorts just got the ABC (anti-ball crushing) upgrade, giving him the freedom from unnecessary adjustments."

Markets need to expand. It makes sense that companies would want to develop a His version of the garment of choice for the ambitious and Bootylicious. But Lululemon for men has yet to catch on, and most of my male friends insist it never will. When I ask why, they are blunt: "You can't wear those pants if you have a dick."

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Originally published on Aug. 22, 2016
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