Welcome to our Surveillance issue.
This issue examines the presence of surveillance around us—from the way we are being monitored in the physical and virtual world, to the potential of using the data we generate to redefine our relationship to the built environment.

Organized as a sequence of our relationship with data, the contributions address monitoring, collecting, archiving, and using the traces that we leave, followed by camouflaging and deleting the traces that we leave. By exploring different meanings of surveillance, this issue seeks to generate a constructive conversation about the history, policies, tools, and applications of the information that we generate and how those aspects are manifested in our daily lives.

Urban Prisons

Issue statement by Iker Gil, editor in chief of MAS Context.

"It felt more like a maximum security prison than a gated community when the Chicago Housing Authority tried to beef up the safety of the neighborhood. Our privacy was invaded with police cameras watching our every move. I guess it is true a few bad apples spoil the whole bunch."

JAMES LOCKHART, FORMER RESIDENT OF CABRINI-GREEN

The top image to the left shows one of the post guards that are still visible in the Frances Cabrini Rowhouses, the oldest and only surviving portion of the Cabrini-Green housing development in Chicago. Positioned in the entry points to the different areas of the development, the bulletproof glass posts were the first thing to "welcome" you to the development. The entrances to each one of the buildings were no different. Police officers, security guards, ID checks, and metal detectors were there to greet you. During a visit to Cabrini-Green with James Lockhart, a former resident of the development (documented in our Living issue), we tried to access one of the buildings where one of his relatives lived. To our surprise, we were told we could not get inside if we did not live there. Not only was our access to the building denied but we were also "invited" to leave the premises of the building. Outside the building, streets showed no sign of trees or other obstacles that could obscure the sight of the police. Steel fences and blue-light surveillance cameras were present at every corner, a reminder that this was no ordinary neighborhood. In fact, as the quote above by James describes, it was much closer to a prison than to a neighborhood.

It is undeniable that Cabrini-Green had many problems. James did not hide any of them when we spoke to him. Living in an open prison, in a constant state of surveillance, did not help matters. Security and surveillance measures varied during the different decades, many being implemented after horrific crimes occurred in the development, including the killing (by a sniper) of the seven-year-old Dantrell Davis on his way to school in 1992. As James mentioned, he witnessed a lot of things while living there, good and bad. But to him and many others (15,000 at its peak) Cabrini-Green was home.

Unfortunately Cabrini-Green is just one example of the many public building developments that faced similar conditions in Chicago and other cities across the United States. Under the Plan for Transformation started in 2000 by Chicago Housing Authority, Cabrini-Green, along with most of the public housing developments in Chicago, have been demolished.

I hope we can learn valuable lessons from the mistakes done in the past, and moving forward we can design with and for people, and not behind their back. Lathrop Homes, one of the last public housing projects remaining, could be a great start.

Post guard, Cabrini Green, 2009 © Iker Gil

The guarded entrance to 1230 N. Burling, Cabrini Green, 2010 © David Schalliol

Charting Surveillance

Google Ngram tracking the presence of the word surveillance in over 30 million books from 1800 through 2008.

0.005%

0.004%

0.003%

0.002%

0.001%

French

Spanish

Italian

Russian

German

Chinese

Hebrew

English

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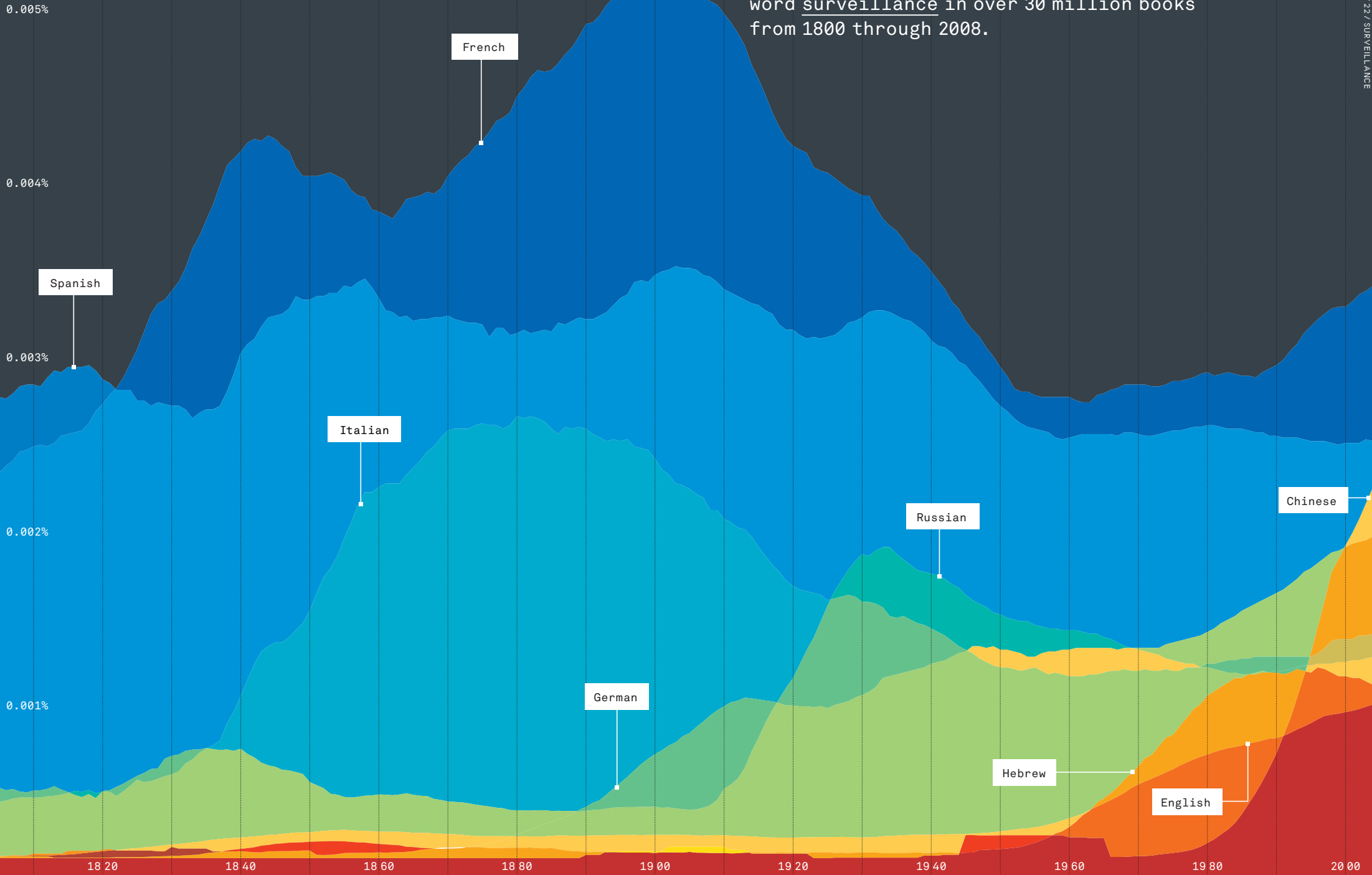
Sony Pictures Entertainment has optioned film rights to Glenn Greenwald's 'No Place to Hide: Edward Snowden, the NSA, and the U.S. Surveillance State.'[1]

Microsoft has more than 1 million servers, according to CEO Steve Ballmer.[5]

All of the [Public School 46 in Bayside, Queens] school's classes, from grades one through five, meet with Ms. Elias, the technology teacher, once a week to learn about sites and apps like Facebook, Twitter, Instagram & Snapchat.[2]

Putting whole populations—the whole human species—under continuous, total surveillance is a profoundly immoral act no matter whether it works or not.[6]

1952: President Harry Truman secretly issues a directive to create the National Security Agency, which allows the Defense Department to consolidate surveillance activities after World War II.[7]

The city of Berlin, currently undergoing the biggest real estate boom since German reunification, has been chosen to pilot a global initiative monitoring urban devel- opment and decay over the next century. Instigated by experimental philosopher Jonathon Keats in cooperation with the Berlin-based team titanic gallery, the unauthor- ized surveillance program will use ultra-long-exposure cameras to continuously document 100 years of municipal growth and decay for scrutiny and judgment by future generations.[2]

Chicago is one of the half-dozen key vertebrae in the nation's digital backbone because it lies at the center of many of the fiber optic cables that stretch between New York and California, the country's major con- nection points to the rest of the world via cables under the oceans. Chicago has the third- biggest fiber optic capa- city of any metro area in the coun- try, behind New York & Washington. And three of the world's largest data centers are in Chicago or its suburbs.[4]

Blackbar is a text game set in a dystopian future of surveillance and censorship. Censorship is frustrating, but the human spirit can beat that frustration by turning it...into a game.[8]

It's a good time to revisit both public and private data collection & handling.[9]

Mayors in places including Copen- hagen and Hamburg hope to cut their cities' en- ergy and water use and waste by upgrading munici- pal services so they can monitor how services are deliv ered and pinpoint where savings can be found.[10]

In experiencing these machines at work, we start to understand that the Internet is not a weightless, immaterial, invisible cloud, and instead to appreciate it as a very distinct physi cal, architectural and material system.[11]

Since facial-recogni- tion algorithms rely on the identification and spatial relation- ship of key facial fea- tures, like symmetry and tonal contours, one can block detec- tion by creating an 'anti-face.'[12]

Frankly, I think just from a moral point of view, if something is seriously wrong in our society then we have a responsibility to attempt to assess it appropriately—no kneejerk responses, no mere paranoia, no mere Big Brother fear—but, we have a responsibility to oppose that which is clearly inappropriate. And surveillance often has negative effects on human flourishing, particularly because through its sorting capacities it tends to reinforce social differences and further disadvantage groups that are already marginalized.[13]

Reports about government surveillance have shown there is a real need for greater disclosure and new limits on how governments collect information. The US government should take this opportunity to lead this reform effort and make things right.[14]

Launching the World Council on City Data along with other cities provides us with an opportunity to benchmark the performance of City of Toronto services to the services of other global cities, learn from other cities, and together address challenges that our cities may face.[21]

Works such as Enemy of the State, Strange Days, Rising Sun, The End of Violence, Eagle Eye, Vantage Point, Untraceable, Déjà vu, Surveillance, Minority Report, Sliver, Caché, The Lives of Others, and The Wire all organize their narratives entirely around surveillance technologies and practices, while others such as the Saw series, District 9, Body of Lies, Lost Highway, Captivity, Panic Room, Snake Eyes, and any number of contemporary action films utilize surveillance technologies as an occasional narrative or stylistic device.[16]

FAA [Fisa Amendments Act] warrants are issued by the Fisa court for up to 12 months at a time, and authorise the collection of bulk information—some of which can include communications of US citizens, or people inside the US. To intentionally target either of those groups requires an individual warrant.[22]

Self-quantifying is being taken seriously by start-ups, in Silicon Valley and elsewhere, which are launching new devices and software aimed at self-trackers. It may even provide a glimpse of the future of health care, in which a greater emphasis is placed on monitoring, using a variety of gizmos, to prevent disease, prolong lives and reduce medical costs.[23]

I spend most of my time assuming the world is not ready for the technology revolution that will be happening to them soon.[15]

There are between 4 and 5.9 million CCTV surveillance cameras in the UK.[17]

Social surveillance is the use of Web 2.0 sites like Twitter, Facebook and Foursquare to see what friends, family, and acquaintances are up to.[24]

The Copenhagen Wheel turns the bike you already own, quickly and easily into an electric bike with regeneration and real-time environmental sensing capabilities. The wheel harvests the energy you input while braking and cycling and stores it for when you need a bit of a boost. At the same time, sensors in the wheel are collecting information about air and noise pollution, congestion and road conditions.[26]

You are shedding data everywhere.[18]

Sentry360, a USA-based manufacturer of advanced Ultra-HD surveillance cameras and systems, announced today the successful deployment of the largest 360-degree surveillance camera system in mass transit history. The final project includes 3600 Sentry360 cameras on nearly 900 rail cars.... Thomas Carnevale, Sentry360's CEO explained, 'This project sets a new standard in public transportation video surveillance. Our solution will be examined and modeled in mass transit systems all around the world.'[25]

The NSA data center in Bluffdale could require as many as 1.7 million gallons of water per day to operate and ke ep computers cool.[20]

Data centers consume approximately 1.3% of worldwide electricity use.[19]

In Barcelona, where the unemployment rate remains above 20 percent, the city expects to cut its water bill by 25 percent this year after installing sensors in local parks. The annual savings are expected to total almost $60 million. [27]

The Predator system was designed in response to a Department of Defense requirement to provide to the warfighter persistent intelligence, surveillance, and reconnaissance information combined with a kill capability. [28]

20 Day Stranger is an iPhone app that reveals intimate, shared connections between two anonymous individuals. It's a mobile experience that exchanges one person's experience of the world with another's, while preserving anonymity on both sides. For 20 days, you and a strange will experience the world in your own way, together. You'll never know who it is or exactly where they are, but we hope it will reveal enough about someone to build your imagination of their life … and more broadly, the imagination of strangers everywhere. [31]

Those who cannot perceive the network cannot act effectively within it, and are powerless. The job, then, is to make such things visible. [32]

Datacenters are the outward embodiment of a huge range of public and private services, from banking to electronic voting, government bureaucracy to social networks. As such, they stand as a new form of civic architecture, at odds with their historical desire for anonymity. [33]

As fiber technology grew in capacity, One Wilshire became not only a staging ground for connecting to the local system, it became a peer-to-peer connection point. In the fourth floor Meet Me Room, telcos are allowed to run interconnects directly between each other without charge. The result is a dramatic cost savings for the companies that results in the highest per-square-foot rents on the North American continent. [29]

Preserving values such as subjectivity and ambiguity is especially important at a time when it is easy to believe that all solutions are computable, and that they are hosted on a server and stored in a Data Centre. [30]

A new drone base in northwest Africa would join a constellation of small airstrips in recent years on the continent, including in Ethiopia, for surveillance missions flown by drones or turboprop planes designed to look like civilian aircraft. [34]

Mr. Pickering was targeted by a longtime surveillance system called mail covers, a forerunner of a vastly more expansive effort, the Mail Isolation Control and Tracking program, in which Postal Service computers photograph the exterior of every piece of paper mail that is processed in the United States—about 160 billion pieces last year. It is not known how long the government saves the images. [36]

The ability of data to flow or be accessed across borders is essential to a robust 21st century global economy. [35]

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The Street as Platform

Essay by Dan Hill

The way the street feels may soon be defined by what cannot be seen with the naked eye.

Imagine footage of a normal street right now, a relatively busy crossroads at 9AM taken from a vantage point high above the street, looking down at an angle as if from a CCTV camera. We can see several buildings, a dozen cars, quite a few people, and pavements dotted with street furniture. Freeze the frame, and scrub the film backwards and forwards a little, observing the physical activity on the street. But what can't we see?

We can't see how the street is immersed in a twitching, pulsing cloud of data. This is over and above the well-established electromagnetic radiation, crackles of static, radio waves conveying radio and television broadcasts in digital and analogue forms, and police voice traffic. This is a new kind of data, collective and individual, aggregated and discrete, open and closed, constantly logging impossibly detailed patterns of behavior. The behavior of the street.

Such data emerges from the feet of three friends, grimly jogging past, whose Nike+ shoes track the frequency and duration of every step, comparing against pre-set targets for each individual runner. This is cross-referenced with playlist data emerging from their three iPods. Similar performance data is being captured in the engine control systems of a stationary BMW waiting at a traffic light, beaming information back to the BMW service center associated with the car's owner.

The traffic light system itself is capturing and collating data about traffic and pedestrian flow, based on real-time patterns surrounding the light, and conveying the state of congestion in the neighborhood to the traffic planning authority for that region, which alters the lights' behavior accordingly. (That same traffic data is subsequently scraped by an information visualization system that maps average travel times on to house price data, overlaid onto a collaboratively produced and open map of the city.)

In an adjacent newsagent's, the stock control system updates as a newspaper is purchased, with data about consumption emerging from the EFTPOS (Electronic Funds Transfer at Point Of Sale) system used to purchase the paper, triggering transactions in the customer's bank account records.

Omotesando crossing, 2007 © Dan Hill

Data emerges from the seven simultaneous phone conversations (with one call via Skype and six cellular phones) amongst the group of people waiting at the pedestrian crossing nearest the newsagent.

The recent browser histories of the two PCs with internet access in a coffee shop across the road update sporadically with use, indicating both individual patterns of websites accessed and an aggregate pattern of data transfer throughout the day. At the counter of the coffee shop, a loyalty card is being swiped, updating records in their customer database.

Outside storefront, 2007 © Dan Hill

The flat above the shop is silently broadcasting data about the occupant's usage of his Sky+ box, DAB radio with Internet connection, and Xbox Live console. His laptop noisily plays music, noiselessly accreting data to build a profile of the user's taste in music at the web-based service Last FM. This track has inaccurate or no metadata, which means it is not registered by Last FM, in turn harming its latent sales prospects.

A police car whistles by, the policewoman in the passenger seat tapping into a feed of patterns of suspicious activity around the back of the newsagent on a proprietary police system accessed via her secured BlackBerry. A

Le Monde, Sydney © Dan Hill

kid takes a picture of the police car blurring past with his digital camera, which automatically uses a satellite to stamp the image with location data via the GPS-enabled peripheral plugged into the camera's hot-shoe connection.

Across the road, a telecoms engineer secures a wireless device to the telephone exchange unit on the pavement, which will intermittently broadcast its state back to base, indicating when repairs might be necessary.

Walking past, an anxious-looking punter abruptly halts as the local Ladbrokes triggers a Bluetooth-based MMS to his phone, having detected him nearby, and offers discounts on a flutter on the 3.30 at Newmarket (the Ladbrokes is constantly receiving updates on runners, riders, and bets, linked to a national network aggregating information from local nodes at racecourses and bookies). The potential punter had earlier received a tip on said race from his chosen newspaper's daily sports bulletin, delivered via his mobile's newsfeed reader software.

As he wonders whether he could discreetly sidle into the bookies to place the bet he'd promised himself he wouldn't, the streetlamp above his head fades down as its sensors indicate the level of ambient daylight on the street is now quite sufficient, switching into a

mode where the solar panel above collects energy for the evening and delivers any potential excess back into the grid, briefly triggering a message indicating this change of state back to the public-private partnership that runs the lighting services in this borough, in turn commencing a transaction to price up the surplus electricity delivered to the grid.

The same increase in daylight causes a minor adjustment in four of the seven CCTV cameras dotted along the street, as they re-calibrate their exposure levels accordingly, the digital video accruing on the array of remote disk drives at a faraway control center is rendered slightly differently in response.

State Library of Queensland, Brisbane, 2007 © Dan Hill

In an apartment over the bookies, the occupant switches on her kettle, causing the display on her Wattson device that monitors real-time electricity usage in the flat to jump upwards by a hundred watts, whilst triggering a corresponding jump in the sparklines displaying usage on the Holmes software that tracks that data over time, which compares her consumption to four of her friend's houses in the same neighborhood.

Three kids are playing an online game on their mobile phones, in which the physical street pattern around them is overlaid with renderings of the nineteenth century city. They scuttle down an alleyway behind a furniture showroom as the virtual presence of another player, actually situated in a town forty miles away and reincarnated as a Sherlock Holmes-ian detective, indicated on their map by an icon of a deerstalker and gently puffing pipe,

Building, 2007 © Dan Hill

stalks past the overlaid imagined space. The three play a trio of master criminals, intent on unleashing a poisonous miasma upon the unsuspecting and unreal caricatures generated by the game.

Approaching the furniture showroom's delivery bay to the rear, the driver of an articulated lorry grinds down through his gears in frustration as he realizes the road over the lights narrows to a point through which his cab will not fit, information not made clear by the satnav system propped on his dashboard. The RFID (Radio Frequency Identification) chips embedded into the packaging of the seven armchairs in his trailer register briefly on the showroom's stock control system, noting the delivery time and identity of

the driver. When formally checked in later by the showroom's assistant with a barcode-scanner, the damage to one of the chairs is noted and sent back to base, automatically triggering the addition of a replacement armchair to the next lorry out to this town, while recalculating stock levels.

In the shoe shop next door, a similar hand-held scanner, unknowingly damaged in a minor act of tomfoolery a day earlier, fails to register the barcode on a box of sneakers, resulting in a lost sale as the assistant is unable to process the transaction without said barcode. The would-be customer walks out in disgust, texting his wife in order to vent his furious frustration on someone. She sends a placating if deliberately patronizing message back within a few seconds, which causes him to smile and respond with an "x" two seconds after that. In doing so, his allocation of SMSs for the month tips over to the next tier in his payment plan, triggering a flag in an database somewhere in Slough.

Deciding to spend his money—that he unwittingly has less of than he did a few moments ago—on a book instead, he steps into the only local bookstore on the street, using the now more expensive data plan of his mobile phone service to retrieve aggregated reviews for the latest Andy McNab, which he half-reads whilst perusing the back cover of the book. Unfortunately the corresponding prices offered up by the review system are in US dollars, as the service is not localized and thus he can't compare prices. This is fortunate for the shop, however, and so during the resulting purchase of the book, the store's stock control system automatically orders a fresh batch of the now best-seller whilst the on-counter top 10 displays McNab's seemingly inexorable rise up the charts on a battered old LCD monitor.

Round the corner, the number of copies of the McNab book in the municipal library remains exactly the same. Instead, the large external LED display hoisted over the door at huge expense conveys the volume of ISBNs of books being swiped by librarians inside the building, in real time. Part of an installation by students at the local art college, the most popular genres of books taken out, inferred from the aggregate of ISBNs and cross-referenced with Amazon, are displayed every five minutes via a collage of randomly selected movie clips from YouTube that match broadly that same genre and keywords (filtered for decency and sensitivity by bespoke software which is itself receiving updates, detailing what is considered obscene at this point).

Glimpse of Brisbane Square, Denton Corker Marshall, 2007 © Dan Hill

Currently, a two-second sequence of a close-up of David Niven's nose and mustache from *The Bridge on the River Kwai* morphs into the bulging right arm of Sylvester Stallone in *Rambo*, cradling a stolen Soviet rocket launcher, as the patterns of clip consumption at YouTube twitch accordingly.

Looking up at the display in fascination and bewilderment, an elderly lady stumbles over a pothole in the pavement. Helped back to her feet by a younger man, she decides to complain to the council about the pothole. The man suggests he can do that right now, from his iPod Touch and using the library's open public Wi-Fi, by registering the presence of a pothole at this point on the local problems database, Fix My Street. The old woman stares at him quizzically as it takes him fifty seconds to close the website he had been looking it on his mobile (Google Maps directions for "hairdressers near SW4," a phrase he'll shortly have to type in again, having neglected to bookmark it) and access fixmystreet.com. He spends the next few minutes indicating the presence of a pothole outside the library on Fix My Street (unaware of the postcode, he has to select one from a few possible matches on street name), before he moves on, satisfied with his civic good deed for the day. The

Tsutaya bookstore, a well-designed bookstore in Tokyo open late into the night, helping keep the streets active and safe, 2007 © Dan Hill

elderly lady had long since shuffled off, muttering to herself. Although Fix My Street smartly forwards on all issues to the corresponding council, a beleaguered under-trained temp in the also underfunded "pavements team" is unaware of fixmystreet.com and unable to cope with the levels of complaint, and so the pothole claims five more victims over the next two weeks until someone rings up about it.

The LED display board can also sniff what is being accessed via the library's public Wi-Fi network, and displays fragments of the corresponding text and imagery. It switches briefly over to this mode, in order to denote that Fix My Street was being accessed, and displays some details of the transactions detailing the pothole issue. Before flicking back to the YouTube x ISBN installation, the display then conveys some information from the local council about a forthcoming street upgrade, blissfully unaware of the possible connection to be made between that and the pothole. Unfortunately, at that point, the pale sunlight hits the screen at such an angle that it cannot be read by two hurrying passers-by anyway. The display then dissolves into a slow pan across Keira Knightly's delicately arched eyebrow from *Pirates of the Caribbean*.

In the swinging briefcase of one of the passers-by, an Amazon Kindle e-book reader briefly connects to the public library—having previously visited the library, the owner had registered the public Wi-Fi in her settings. It commences a rapid-fire series of handshakes with Amazon's systems, swapping personal details back and forth with user profile information, and thus beginning to download a new book by Ian McEwan to the device. Despite the wealth of metadata in this rich stream of data, the Kindle's closed system means that the library's databases, and LED display installation, cannot possibly be made aware of this literary transaction being conducted using its infrastructure. Either way, with seven seconds the Kindle user is out of range and the download automatically fizzles out, settling back to wait for the scent of open wireless.

Behind the library, a small nineteenth century cottage that has been on the market for a year now is being re-valued by estate agents. This new figure, a few thousand pounds less than the previous, is entered automatically via the estate agent's PDA and ripples through their internal databases and then external facing systems. It doesn't trigger any change in three other proprietary databases listing average house prices in the neighborhood until three weeks later. This house price change subtly affects the average for the area, which is later recombined into the aforementioned map that compares with commuter times for the borough.

State Library of Queensland, Brisbane, 2007 © Dan Hill

An employee of the local water company knocks on a door up the street, calling in order to take a reading from the house's meter. She uses a bespoke application on her mobile phone, which should indicate the location of the meter on the property. In this case, it doesn't, so she has to ask.

Five TomTom satnav systems in five of the twelve cars on the street suddenly crash for reasons unknown, causing an instantaneous reboot and login sequence over the course of twenty seconds. One driver notices.

The four other drivers are slightly distracted by the glow of a giant TV screen, installed and operated by the council but paid for through corporate sponsorship, which glowers over the end of a pedestrianized-shopping mall at the end of the street over the lights. It's broadcasting the Australian Open tennis, which is being played live in Melbourne. A homeless person is sleeping underneath the screen, soaking up some of its transmitted

Darlington, 2007 © Dan Hill

warmth. An on-street information kiosk stands beside the screen, offering a scrollable map of the local area and directory of local businesses. It's little used, as the directory of businesses was always incomplete and intermittently updated, its data now rusty and eroded by time. Plus maps are available on most people's mobile phones. Still, the printer installed in its base occasionally emits a money-off coupon for some of the local businesses.

Under the pavement on one side of the street, a buried sensor records the fact that some fiber-optic cables are now transmitting data with 10% less effectiveness than when they were installed. A rat ascends from an accidentally uncovered grille under the library's down-pipe nearby, its whiskers containing trace elements of plastic cladding.

A blogger posts an entry on her weblog regarding some new graffiti on the library's rear, uploading the image via her mobile phone, thanks to her blog platform's relationship with Flickr, a popular photo-sharing site. She adds a cursory description of the stenciled representation of the Mayor's face superimposed onto a £50 note instead of the Queen's. Shortly afterwards, she receives an SMS from the service Twitter, indicating that two of her friends are heading for a café up the street, and she decides to intercept them to discuss her find, sending back the URL of her post and the time of her imminent arrival. Her phone's Google Maps application triangulates her position to within a few hundred meters using the mobile cell that encompasses the street, conveying a quicker route to the café. Unfortunately, none of their systems convey that the café is newly closed for redecoration.

Working from home in his small house backing onto the old cottage, a lawyer files his case notes via the password-protected intranet his company operates, his Wi-Fi network encrypted to prevent leakage of such confidential data. He then closes his network connection, switching instead to his neighbor's Wi-Fi network—which has been left purposefully open in the interests of creating a cohesive civic layer of wireless coverage on their street—in order to watch the watch the highlights of his football team's two-nil victory the night before. In this way, his own remarkably cheap wireless network data plan never goes beyond its monthly cap. This parasitic wireless activity is only curtailed months later,

Surry Hills, 2007 © Dan Hill

when the previously benevolent neighbor uses some free sniffer software she downloaded to detect the presence of the Wi-Fi router that's responsible for the majority of the data usage in the street.

A local off-license has an old monitor in the window that cycles through a series of crude screengrabs of faces of shoplifters of local stores, derived from the various CCTV systems owned by a local association of shopkeepers. Unfortunately, the face of the purchaser of the Andy McNab book is mistakenly added to the system three weeks later.

(Coincidentally, in a meeting being conducted several miles away, a project team working on council tax systems briefly considers whether a system of localized screens displaying which houses in the street had not paid their council tax yet, updated wirelessly, would be ethically sound.)

Waiting at the lights, someone pays their council tax by mobile phone, triggering an internet-based bank transfer via SMS. Across the road, a car belonging to a citywide car-sharing network patiently waits to be activated by a swipe of a member's RFID card. It transmits its location and status back to the car-sharing network's database every few minutes. Also in a prime position by the lights, a café is briefly office to two businesspeople having an informal meeting. Although the café's wireless network is closed, their usage charges are paid for by the company they work for, and they barely notice the cost. The company credit card details are retrieved automatically over a secure transaction. Though it has poorer muffins, the café opens 90 minutes earlier than the library.

A series of small high-resolution displays, hanging under each traffic light and angled towards stationary drivers, alternately communicates the number of accidents that have occurred around these lights in the last year, and then the current speed limit, which can be calibrated to an optimum level for the current traffic conditions in the borough. The traffic lights also house the city's congestion charging system's cameras, logging the license plates of cars passing through its network of inner-city streets.

Single Origin, 2007 © Dan Hill

A wireless sensor network, carefully and discreetly embedded in the trunks of trees lining one side of the street, silently monitors the overall health of the limes and planes, collating data and waiting patiently for the council's tree surgeon to inspect the arboreal vital signs.

At the end of the line of trees, a new bench has been installed on the street. At either side of the bench, there are two

Tree, 2007 © Dan Hill

standard electrical power points freely available for citizens to recharge their phone or laptop. A small LED winks to indicate this, alongside a standardized explanatory icon drawn up by the department also responsible for the highways' signage systems. The power running to the bench is carried via flexible cables that can twist and stretch around the growing roots of the nearest trees. The bench also carries a WIMAX transmitter as part of a research project led by the local university. As such, this bench appears as a key node on several GIS.

Benches, Tokyo Midtown, 2007 © Dan Hill

A cab drives through the traffic lights as they switch to green and it quickly signals to turn left, looking to nose back on itself as the presence of a fare is indicated at a nearby hairdresser's, via the in-taxi control system. A faraway voice crackles over the intercom a few seconds later attempting to verify that the driver is en-route. The driver clarifies she is en-route but that she'll take a few minutes more than usual as her satnav system indicates high traffic levels across the three normal routes taken.

At another building on the street, a new four-story commercial office block inhabited by five different companies, the building information modeling systems, left running after construction, convey real-time performance data on the building's heating, plumbing, lighting, and electrical systems back to the facilities management database operated by the company responsible for running and servicing the building. It also triggers entries in the database of both the architect and engineering firms who designed and built the office block, and are running post-occupancy evaluations on the building in order to learn from its performance once inhabited.

CBD, Sydney, 2007 © Dan Hill

In turn, and using this feed, the city council's monitoring systems note the aggregated energy usage for the commercial buildings on the street, constantly shuffling its league table of energy-efficient neighborhoods. The current score for the street, neighborhood, and city is displayed outside the nearby library, on a trio of vertical axis wind turbines with LEDs embedded in their blades.

A prototype of a similar monitoring system, but embedded in the bus stop opposite the library, records the performance of the lights, travel information displays, large plasma-screen advertising display, and the chilled-beam cooling system newly installed for comfort. The travel information displays themselves receive updates in real time via a slice of ra-

Fire station, 2007 © Dan Hill

dio spectrum allocated to such data, indicating the proximity of the next five buses. This same system also conveys the latest information on the whereabouts of the no. 73 in particular, in the form of an SMS to a prospective passenger who has selected this as her "favorite bus" via the transport company's website. Around the corner, she breaks into a trot accordingly.

The plasma display is currently running an advert for the local radio station's breakfast show (displaying a live stream of SMS messages sent to the show, filtered for obscenity and likelihood of libel). As the slightly out-of-breath imminent passenger arrives within range of its Bluetooth-based transceiver, it cross-fades to a display from the city's premiere modern art gallery, with whom she has registered her mobile phone as a preferred mode of communication and whose systems are quickly cross-referenced for her attendance record for the last few years, and thus it informs her of a new exhibition about to start.

This she doesn't notice at all, but one person in the loosely defined queue around the bus stop does, and scribbles the details on his hand. Four seconds later, the display recognizes another mobile phone with an open Bluetooth connection and an active account within the agglomeration of companies that have registered their databases with this advertising service, and shifts its display accordingly. The call-and-response between the queue and the screen continues until the bus finally pulls in and the screen's transient audience dissipates. It settles back to a carousel of generic advertising messages and local information tailored to that street and its surrounds.

As the bus departs, the new passengers onboard swipe their RFID-based integrated transport system ID cards, updating mass transit databases with every possible aspect that can be gleaned from this simple activity (time of day, location, frequency of use, favorite entry points etc.) The now-empty seat in the bus stop registers that it is indeed empty using simple sensors, and wirelessly logs this fact with a database monitoring the usage and state of street furniture in the neighborhood. Powered by solar panels on top of the bus stop, it creates a pulsing ambient glow.

Across the road, another billboard displays the number of reported burglaries and bag snatches in the neighborhood in the last three months, live data direct from the police force systems. This causes several passers-by to feel a touch more anxious than they did

Miller's Point, Sydney, 2007 © Dan Hill

GOMA sign, road sign, Brisbane south bank, 2007 © Dan Hill

Bus stop at Eleanor Schonell Bridge, also known as the Green Bridge, Brisbane, 2007 © Dan Hill

a moment ago. Had they walked past a moment before, the billboard would have been displaying information on a forthcoming community sports day at the local park. One of the passers-by would have recognized their son in the video of last year's winners, running in slow motion under the crisp typography. A moment before and the passers-by would have been subjected to a tortuous promo for a Portuguese avant-garde play currently running at the local theatre, within which a QR code displayed in the top-right hand corner could've been read with a mobile phone's IR reader, delivering the website for the theatre to the phone's browser.

Of the two bars, two pubs, and three cafés on the street, only one has recently checked that the location and description data overlaid on Google Maps is present and correct, and thus is fortunate to receive two hungry Hungarian tourists for a full English breakfast with all the trimmings.

Twenty meters below the ground, a tube train scurries under the crossroads, outrunning its halo of data that details its location and speed from the engine control systems, while CCTV conveys images of the carriage directly underneath. The carriage contains forty-four mobile phones seeking a signal, some with Bluetooth headphone sets; ten BlackBerries and four other PDAs likewise; thirteen MP3 players of varying brands, a couple also with Bluetooth headphones; seven sleeping laptops.

Directly overhead, ten thousand meters up, the distant roar of a commercial airliner's Rolls-Royce engines, beaming their performance data back to engineers via satellite in real-time. . .

And press play. . .

This somewhat banal sketch of an average high street is very deliberately based on the here and now; none of the technology lurking in the background behind this passage is R&D. Most of it is in use in our streets, one way or another, and the technology that isn't could be deployed tomorrow. As such, given the time from lab to street, it represents the research thinking of over a decade ago.

This doesn't even go near concepts like Bruce Sterling's spimes,[1] or The Living's Living City,[2] or Christian Nold's bio mapping,[3] in which objects, people, and buildings constantly, silently, and invisibly communicate with each other, shaping each others' behavior and representation.

And arguably, this still underestimates significantly the size, shape and intensity of the data cloud immersing the street—it's the tip of the iceberg.

Moreover, in centering on a snapshot, it doesn't convey the ebb and flow of systems and data over time. It's not even particularly contrived—there are no sketches of, say:

- *an urban planning student measures the varying Wi-Fi signals up and down the street for her research into the informational city* or,
- *three documentary film-makers deployed by the council film slow-motion sequences of pedestrians' feet crossing the road, later digitized as part of a multimedia portrait of the neighborhood* or,
- *a dysfunctional teenager hacks into the bookie's systems, after a morning of being ignored by his parents, and proceeds to swipe the credit card details of the four old men inside, later publishing them on the internet after placing a frivolous selection of bids at eBay in one of the old men's names* or,
- *a writer denotes the ghostly presence of a 12th century market using psychogeographical markup language* or,
- *for fun, a bored intern at an urban planning consultancy drives simulated herds of cattle through a digital model of the crossroads designed for predicting the patterns of behavior in crowds during a terrorist attack* and so on.

Instead, this is all everyday technology—embedded in, propped up against, or moving through the street, carried by people and vehicles, and installed by private companies and public bodies. Each element of data causes waves of responses in other connected databases, sometimes interacting with each other physically through proximity, other times through semantic connections across complex databases, sometimes in real time, sometimes causing ripples months later. Some data is proprietary, enclosed and privately managed; some is open, collaborative, and public.

> "Informational systems are beginning to profoundly change the way our streets work, the way they are used, and the way they feel."

Yet how much of this activity is obviously perceptible on our streets when viewed through conventional means? The snapshot above, without the explanatory narrative of the systems being touched by these activities, would just like a freeze-frame of a few people and vehicles set against a backdrop of buildings. A photograph or drawing would show only a handful of people, a few vehicles and some buildings. Traditional urban planning might note patterns of flocking or grouping, when tracking the flow of people through a space, yet would they make a causal observation based on the presence of the open Wi-Fi that created a "flock"?

Forty years ago, the British architects Archigram suggested that "When it's raining on Oxford Street, the buildings are no more important than the rain." The group's David Greene subsequently asked, "So why draw the buildings and not the rain?" Why indeed? The sketch above tries to describe data rather than rain, but they're similarly ephemeral. The work of Archigram, and others, may provide some useful prompts for thinking about this softer infrastructure—when critiqued—though Greene himself has noted that the importance of apparently permanent buildings has persisted, even for "the electronic nomads of the global financial systems." So the more relevant question is how do the buildings and the rain of data interrelate?

Informational systems are beginning to profoundly change the way our streets work, the way they are used, and the way they feel. This in itself presents a major challenge for the existing practice and vocabulary of planning. How much of this life of the street, this rapidly increasing torrent of human activity, is registered as a field of enquiry or activity in most planning activity? Imagine this street scene over the next few years of deployment of a more ubiquitous and pervasive computing, and the challenge to identify, understand, denote, and plan for this environment is even more pressing.

Considering the non-visual senses might be a better analogy when it comes to perceiving the way data affects i.e. looking at the way the street sounds, feels or smells. References here would include Finnish architect Juhani Pallasmaa's book *The Eyes of the Skin* and the collection *Sense and the City* edited by Mirko Zardini (particularly geographer Stephen Flusty's work on new descriptions of spaces, such as "stealthy spaces—that cannot be found," "slippery spaces—spaces that cannot be reached," "prickly spaces—that cannot be comfortably occupied," "jittery spaces—that cannot be utilized unobserved," and so on). The somewhat esoteric world of psychogeography—the layered informational and psychological history and geography that conveys a sense of place—might be another reference point. Sound could be a particularly useful analogy, as data has similar characteristics, and is at least partly understood and considered by existing policy, even if it generally focuses on noise abatement, rather than the potential of encouraging what some research is calling "positive soundscapes."[4]

So the patterns of data in the streets, the systems that enable and carry them, the quality of those connections, their various levels of openness or privacy, will all affect the way the street feels rather more than street furniture or road signs. Holes in data, public and private, may become more relevant than the pothole in the pavement—until you trip over it, at least. (This latter point isn't frivolous—for we should be aware of the limits of information services, until made physical. Either from a phenomenological point-of-view, or from the view that just says these systems tend to be transient, it's important to keep a sense of perspective.)

The sketch above deliberately traverses quite a few modes of activity—from private to public; individual to civic; commercial to recreational; residential to vocational. And in all instances systems are in flux, in development, or require implementing, testing and shaping.

In many of these instances there are decisions to be made about openness, responsibility, privacy, security, interaction, and experience. Some of these will be directly under the aegis of government, some through public-private partnerships, some though architects of the built environment, some through architects of this informational environment, some through commercial enterprises, some through NGOs, some through municipal institutions, some through education, some through individuals or community groups, and so on.

There are decisions to be made about raw infrastructure—the equivalent of transport networks and power supply. Should the street be enabled by fiber optic, copper wire, WIMAX, 3G, 802.11× Wi-Fi, and so on. How close does that run to the curb? Who will install and operate? How smart should street furniture be? How should it convey itself to the world? Should it expose its seams, to aid understanding and engagement, or withdraw silently into the woodwork, reducing clutter and complexity? What would happen to the flow
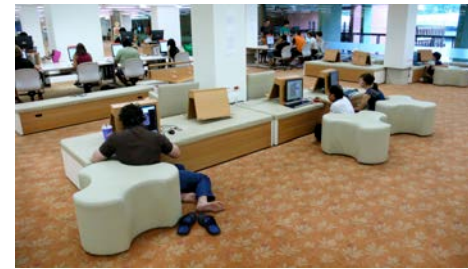
The excellent and well-used InfoZone at the State Library of Queensland, 2007 © Dan Hill

on the street if the street furniture attracted clusters of people within its halo of connectivity?

Without this infrastructure, the street only half-exists, becoming a residual dead-zone in the city. And yet should areas on the street deliberately be dead-zones, shielded from connectivity in order to provide respite, reflection, quietude? How is that to be managed and conveyed?

Car engines may be limiting their speed themselves, via GPS—should traffic control systems have some say in their real-time calibration too, to ensure optimum speed levels for the city? As control and monitoring systems become pervasive, how should the relationship between private and public infrastructure, behavior, and legislation respond? In terms of public transport, car-sharing schemes and real-time congestion pricing, are mesh networks the right way to go?[5]

As the location and timing of work and leisure becomes ever more entwined and slippery, how should the infrastructure and shape of the street respond to this? How to deal with legacy issues, like the defunct kiosk mentioned earlier, given the rate of change in technology and cultural understanding of technology? Are leasing or ownership models appropriate for the hardware and for the software?

Who is responsible for the representation of the street on the various informational systems underpinning the above sketch? Or, conversely, the representation of those informational systems on the physical street? Who looks after the digital equivalents of "Blue Plaque" heritage signs, in which the layered history of the street can be explored—do they need a form of planning permission?[6]

QUT Kelvin Grove campus, Brisbane, 2007 © Dan Hill

What is the power consumption of this street? As Buckminster Fuller might have said, "how much does this street weigh?"[7] The displaced energy consumption of the street, distributed on to servers and power sources all over the world, could be immense. Conversely, much of the connectivity may rely on a handful of key undersea cables providing high-speed bandwidth to the city. These will occasionally convey a sense of fragility in the network, perceived but not comprehended by users. As the scenario is largely here and now, it appears unaffected by the issues of "peak oil" and the different kind of supply that renewable energy sources might entail. Any future scenario planning needs to consider that aspect in particular rather more carefully.

In each case, who is best qualified to deliver all this?

The complex interplay of these fibers will help define the sense of the street, and planners first of all need to identify this rich, sometimes slippery network, before going on to decide where it can be shaped and where it should be shaped.

Note: It's also worth bearing in mind that complex software models can convey some of this data fairly

Power cut, 2006 © Dan Hill

exactly, yet still not tell us about the cultural memory of the street. This system is in turn a part of other, more complex systems of behavior and representation.

There are two caricatured possible futures that can be deployed to flush out a few more issues.

1. Locked-Down Street
The depiction of the highly privatized data environments which constantly reach out to potential consumers is familiar from numerous hackneyed science fiction plot-lines. For example, the now infamous and faintly ludicrous scene in *Minority Report* where the protagonist is assailed by highly targeted ads as he walks through a shopping street.[8]

Systems that are focused around a user's private data, then played back to them with little or no chance of opt-out, are likely to emerge nonetheless. This we can infer from current web-based systems. Spam filling an in-box is debilitating enough without the physical urban environment adding to the problem. Social software systems rarely let you cleanly unsubscribe. Thus the call for secure privatized systems for advertising display, as in the bus stop sketch above, will be strongly made by companies claiming to prevent irrelevant or misleading messages polluting the physical environment.

Equally, many of the scenarios above indicate highly personal data—browser usage patterns, credit card details, traffic control systems, and so on. So it's clear that the street will be a platform for highly secure data transfer and proprietary systems. Personal data security will be an increasing focus for individuals and service providers, as the often-haphazard approach to personal data will not be allowed to continue, through regulation and compliance (compare with the UK government's recent mishandling of social security records). Equally, systems with potential to reduce public safety if misused—the traffic light controls above, for example—will need to be carefully regulated and deployed as highly secure systems.

The intriguing area, however, is around systems in which personal data is used more openly. Where patterns of behavior are played back to people, as per current social software systems like Facebook, Last FM, Flickr, Twitter, etc.

Judging by uptake of this social software over the last few years, it seems the average user cares little for privacy of much personal data. Look at Facebook et al, and you'll see an awful lot of personal data given away. Users can play fast and loose with the veracity of this data, but one can assume that a fair proportion is accurate. However systems can overstep the mark. Witness the response when Facebook did try to deploy a highly targeted advertising model based around personal data and that of users' friends; the resulting furor meant that Facebook had to withdraw the functionality, at least temporarily and at least in that form. With commercial proprietary systems based around social data, a desperate reliance on the users' goodwill

and ongoing patronage can mean a self-moderating system to some degree. If a proprietary system is perceived as using data inappropriately, when re-using it on its users, it's likely to be subject to resistance.

So the general movement within social software systems—which we might be able to take as canaries in the coal mine for wider patterns to some extent (though it might be very different when physical)—is towards an openness in terms of recombining data. An optimistic viewpoint perhaps. (And one solely derived from observing that social software written under a largely Californian ideology, whose mileage may vary massively in different urban cultures.)

Equally, closed systems will rarely be able to take advantage of the aggregated patterns of data that could emerge from a neighborhood. For instance, a concept like the Personal Well-Tempered Environment relies on the various sensors and meters implanted in energy-monitoring devices being able to communicate with one another over open standards, irrespective of who constructed, distributed or runs the system.[9] Proprietary systems, while ideally suited to high-security purposefully closed networks, are intrinsically unlikely to enable a form of creative aggregation and connection unintended by the owners and makers. If BMW's ConnectedDrive system was open and shared by other manufacturers, imagine how useful elements of that automobile engine data might be to transport and environmental planners too?[10]

So as the street begins to produce data on a vast scale, locking all of it down seems both impossible and counter-productive, as a suspicion of using such data inappropriately, well-founded or not, will lead to resistance.

Moreover, the locked-down street, based around centralized proprietary systems, can be surmised to struggle with localization. (See the "price finder in US dollars" example above.) Intrinsic local detail will tend to require collaborative updates from local users themselves. Broader platforms that draw on such openly produced collaborative efforts (such as Google) may well continue to be popular—note how Google Maps conveys the street—but is dependent on the kindness, and quality, of strangers.

Crucially, better GIS data (across multiple independent systems) will become fundamental to the way the street is articulated. Omissions in data already lead to issues for British streets—note how some articulated lorry drivers end up careering through small country towns, their GPS systems had leading them there to avoid traffic, only to discover that the roads are too small for their trucks.[11] A street that does not accurately convey its state to such systems is in danger of being ignored or inadvertently misused. An open approach to descriptive data can enable a far richer local dataset to emerge, more accurately conveying the sense of what the street is. It may also be patchy, however.

Given the commercial environment most of this

technology is developed in, it's likely that multiple, fragmented and disconnected systems will embed themselves in the increasingly responsive and interactive façades and fabric of the near-future street. This may mean familiar issues, but now manifest in the built environment:

- Frustration of data locked in one system that can't be transferred to another
- Systems unaware of other systems, and thus do not enable useful connections to be made (physical or digital)
- Poorly-designed systems which inadvertently convey too much personal information
- Tracking of patterns of behavior that are not made evident to the user
- Systems that convey information poorly

Amongst others. This commercial development is a given, and often not related to those whose job it is to shape streets.

Yet traffic systems, signage and display systems, mass transit systems, municipal buildings, street furniture, landscaping, the quality and typology of infrastructure laid down, public databases and information systems, acquisition and communication of community information, and encouragement of commercial activities through levies, grants, and public-private partnerships are all examples of wider civic concerns for those who do have to shape streets.

Planners and architects have to decide, and soon, whether they want to have a say in this scenario. By their actions in terms of infrastructure, schemes and thought leadership, how will they shape the street? It might well mean a new multidisciplinary and holistic approach to the street. As Reyner Banham said, when you're running with technology, you're in fast company—and you may have "discard the professional garments by which you are recognized."

2. Open-Source Street
Many of the examples in the sketch above have been left deliberately ambiguous as to their openness. The various information modeling systems—the building information modeling system; those conveying the state of local services; those broadcasting the presence of a bus—could be built with openness in mind.[12] Why do this? In order to enable maximum coverage and to stimulate engagement and innovation, with occasional possibility for unintended creative use. And often, it's public data and therefore part of a civic relationship.

Just as good street planning might leave a space open to possibility, and not over-prescribe its program, so informational systems can leave themselves open to possibility. The powerful notion of an API (Application Programming Interface) means that a database can be machine-readable (by code in other systems) and that data can be used elsewhere. APIs can have

various qualities—be read-only or read-write, open or closed, and so on.

The library LED installation above might be rather more creatively and usefully imagined as a read-write system. For instance, so that others could insert local information—say, a database of the nearest school's football team scores—into the stream of information. The bus information system could have a read-only API to enable others to build new visualizations of when buses are due, perhaps deployed even in sculptures or using sound, or enable users of more obscure or outdated mobile devices to have representations of the service programmed for their handsets (which is unlikely to happen with commercial development). The API on those Rolls-Royce engines 30,000 feet up should be *particularly* closed, however.[13]

Interestingly, the equivalent of road signage—say, digital displays of civic information—might be best served not through an open platform. As traffic signs and markings in the UK comply with the Traffic Signs Regulations and General Directions 2002 (TSRGD), it raises the fundamental question of whether a digital equivalent for civic/public data needs to exist. The flexibility of representation in the digital realm—known on the web as separating content from presentation—means that numerous possibilities exist for displaying data. But should public/civic data have its own hallmark of quality, and undergo the kind of stringent analysis and compliance that physical signage has? A Kinneir and Calvert design for displaying public data? Or should the flexibility of the medium enable data to float freely across numerous platforms and modes, enabling different presentation across in-car head-up displays, mobile phone screens, physical displays as per the wind turbines above, façades on municipal buildings and so on. Could we do both?

In a sense, the entire street itself can now be thought of as having an API, conveying its overall behavior to the world, each aspect of it increasingly beginning to generate and recombine data.

From a governance perspective, all this real-time data should be invaluable to those whose job it is to maintain and develop the street—forming a kind of post-occupancy evaluation for the entire neighborhood—but if the same data were made open, accessible, and approachable (anonymised appropriately) the community that uses the street could end up feeling far more engaged in their environment. The patterns of use in their data become as self-evident as that shortcut worn through the grass in front of the library. If they can add further detail to this environment, using the street as a platform, all the better.

For instance, simply triangulating location via mobile cell (as per Google Maps Mobile) is currently not accurate to the building level but can often infer the street with some accuracy. With this simple application, wayfinding is enhanced instantly—this is the street you're on, at the touch of a button. The street then has an opportunity to announce itself to the

user, via business listings, historical information etc., all capable of being listed via Google Maps layers (or equivalent). Here is an example of an open system i.e. data is not moderated or prevented, but it is enabled by a third party. (Ownership is a complex issue here. The street's data is contributed by various parties, but what does Google own?) Aspects of the street not perceptible in such information systems—like the other cafés the hungry Hungarians didn't know about—may become invisible, in a sense. Does the library exist on this street? Does the smart bench? Should their digital representation relate to their physical wayfinding elements?

London wayfinding kiosks, 2007 © Dan Hill

So there are a huge variety of possible approaches here, as finely grained and multi-dimensional as there are approaches to planning the built fabric of the street.

In terms of built fabric, the physicality of these informational systems becomes important too. In the locked down street, systems may record behavioral data invisibly. As with Facebook, this sense of being invisibly watched is likely to raise suspicion. If the sensors are made visible, and if the results are made visible, with feedback mechanisms, that's a different story, at least partly.

For instance, meters and sensors can often be deployed on the street with little information about their purpose.[14] From now on, it may well be important to make the invisible visible here too, to communicate its function and purpose. Though this might appear counter many trends in contemporary product design (e.g. iPod)—where the goal is often to hide, disguise, or remove the seams that indicate how the product works, or is constructed or articulated—actually showing the seams of an object is far more likely to engender trust, engagement, and appropriation.[15]

The city information model briefly described in the sketch would benefit from an open API, enabling the kind of innovation described in the Personal Well-Tempered Environment idea. Again, appropriate decisions need to be taken about privacy and ethics—should councils be able to zoom down to house level to see individual environmental behavior, or should individuals be able to see their neighbor's efforts, or their council's efforts? Might public, or public-private, bodies be a contender for managing the overall data around environmental behavior at the street, neighborhood, and city levels?[16] By exposing this data in an open fashion, they again engender trust, stimulate innovation, and have some say in the informational civic relationships emerging from the street, a civic relationship as important as any other.

And yet, an open-source approach can mean that the range and depth of information, and the quality of execution, are left in the hands of others. Will the wisdom of crowds conjure a street rich enough to, as Baudelaire had it, enjoy taking a bath of such multitude?

The reality of course is that the near-future street will simultaneously encompass both scenarios—and many more—as in the sketch, due to the multiplicity of clients, services and products that make up a neighborhood. Designing the contemporary street means attempting to understand and shape the most complex set of relationships between humans and the built environment yet imagined.
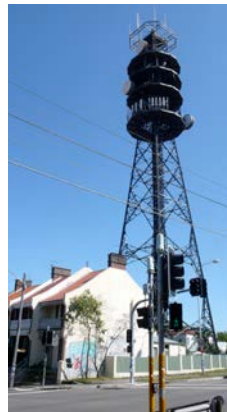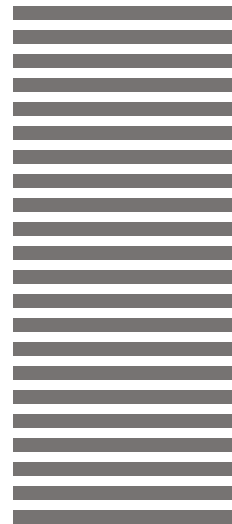
Wonder what their reception's like? 2007 © Dan Hill
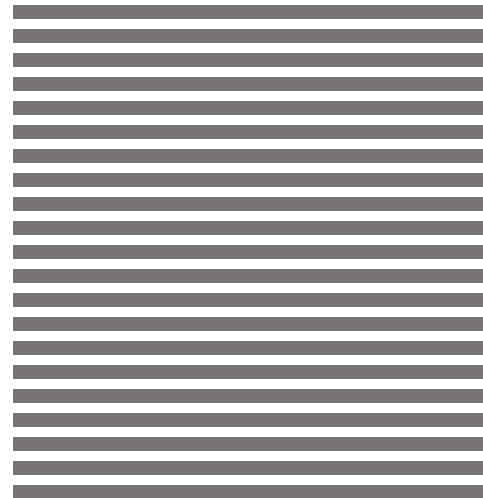
1   Bruce Sterling, *Shaping Things* (Cambridge: The MIT Press, 2005).

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6   "Make Your Own London Blue Plaque," accessed May 20, 2014, blueplaque.com/.

7   In 1978, while reviewing Norman Foster's Sainsbury Center for the Visual Arts, Buckminster Fuller asked him, "How much does your building weigh?"

8   "Minority Report—Personal Advertising in the Future," YouTube video, 1:01, posted by "dscmailtest," December 7, 2010, youtube.com/watch?v=7bXJ_obaiYQ.

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11   Sarah Lyall, "Turn Back. Exit Village. Truck Shortcut Hitting Barrier," *New York Times*, December 4, 2007, nytimes.com/2007/12/04/world/europe/04gps.html?_r=0.

12   "@cityofsound #BIM," *Delicious*, accessed May 20, 2014, delicious.com/cityofsound/BIM.

13   "Rolls-Royce Engine," *Aviation Today*, June 1, 2006, aviationtoday.com/am/categories/commercial/345.html#.U3uDA61dXUM.

14   Kazys Varnelis, "If You See Something, Say Something," *varnelis.net* (blog), accessed May 20, 2014, varnelis.net/blog/if_you_see_something_say_something.

15   Dan Hill, "Architecture and Interaction Design, via Adaptation and Hackability," *City of Sound* (blog), accessed May 20, 2014, cityofsound.com/blog/2006/05/architecture_an.html#thingshackable.

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This text was originally published on Dan Hill's blog cityofsound.

NETWORKED URBANISM: USING TECHNOLOGY TO IMPROVE OUR CITIES

Iker Gil interviews John Tolva,
president of PositivEnergy Practice

Chicago: City of Big Data, Chicago Architecture Foundation, 2014 © Iker Gil

The city and its citizens are continuously generating data through smart phones, social networks, apps, and sensors that measure any aspect imaginable.

How can this vast amount of data be useful in shaping our cities?

What patterns does it uncover?

How interconnected is the data we collect and archive?

How do these technologies change how people use space?

What are the unwanted consequences?

To address these questions and discuss the relationship between data, people, and cities, we talked to John Tolva, president of the Chicago-based engineering firm PositivEnergy Practice and former Chief Technology Officer for the City of Chicago.

You like to use the concept of "networked urbanism" instead of "smart city." Can you define what network urbanism is and what the difference between those two terms is?

I think the problem with the term smart city is that it has nothing to do with people. Or at least humans aren't implied in that term. A city could be just the sum of its infrastructure, and that wouldn't be a very fun city. I think the early wave of smart city thinking was very infrastructural, like, "let's put sensors on everything and there is your smart city." That is only half of the equation. Urbanism, which is the human approach to living in the city, is a better term. Sensors, apps, and technologies become activated by people doing interesting things, useful things, and sometimes bad things. It is the human actors in this mix that make it urbanism. Smart, to me, can mean a million things. Networked doesn't imply good or bad necessarily, but it does imply a kind of scale. One person with an app is not really contributing to the urban vitality. A thousand people with that app, using a thousand sensors, makes it something new. I opened my talk at the Chicago Architecture Foundation by saying that the best cities have always been smart. It was just that the feedback cycle was slower. What changes now is the scale and the pace in which that information can be exchanged.

What elements define this networked urbanism?

One is using this technology to an end. And the end is to further the goals of urbanism. Urbanism has nothing to do with technology per se. It has to do with making a city more livable, more vibrant. There are a few millennia of examples of good urbanism, applying the core principles of urban planning and urban life. That's the goal that we are going after. It's not that we want a better map or a better app. We want better cities. But what's happening now, and this is where sensors and humans come in, is that feedback loops are spinning much more quickly. There are many examples but one of them would be Waze, a community-based traffic and navigation app where drivers share real-time traffic information. It was acquired by Google in 2013, so, if you go to Google Maps and look at traffic, it is uncannily accurate. In the old days it used to be one sensor, if you will. It was a helicopter saying "the

Kennedy looks backed up." The morning news shows still do that. Now, we have Waze which basically knows where you are and how fast you are going, relaying that data to Google. It creates millions of sensors out there, human sensors. The feedback loops are quicker, sometimes using social media, sometimes using an actual sensor.

In the office we have a Raspberry Pi, which is basically a $40 computer. With it we track what is going on in specific areas of the office in terms of light, temperature, humidity, and barometric pressure. At $40 you can put these things all over the place, for example in a wheel well of a Divvy bike. Our challenge is to figure out how this data can help us to design better cities and make them more livable.

Trashcans have sensors to alert when they are full and need to be emptied. It is interesting how these sensors attached to elements or activities that we already do, such as riding a Divvy bike, now can provide new sets of data.

It tells you what it maybe wasn't designed to tell you. That's why I liken the Internet of Things, or networked urbanism, to data portals. Some of those interesting things have been built on city data, which let's face it, some of that is sensed, that is the vital signs of a city. Some of the coolest things were things that the city could have never dreamed that they would be used in this way. The same thing goes for sensor data. We don't know what people will use some of this for. We have to be careful, of course, with personally identifiable information. But the data that public infrastructure generates, which is paid for by taxpayers, should be readable. Kevin Lynch talks about the legibility of the city. He refers to it architecturally, from a planning perspective. But I see that term as being just as relevant in a digital sense. Just earlier today, Apple announced that it's putting together a home object framework, so that your lights and everything can talk to one another.[1] That doesn't really exist at the city scale. I don't think a company should own it necessarily, but there is real opportunity for making the city more legible. Imagine the navigation and environmental opportunities if the city could be very easily read. If networked public objects like bus shelters and bikes themselves had a networked presence that was query-able.

Companies, whether public or private, might be collecting data with a goal in mind, but once they make that data public people can read it and use it in unexpected ways. There is that unknown component.

In some ways that is the promise. That is the interesting thing about big data. You are collecting information at such a scale that there is no way of forming the hypothesis ahead of time as to what it will tell you. That is where machine learning comes in. Machine learning is there to be able to define the patterns without you collecting it with an idea in mind, that it will tell us this. Charlie Catlett runs the Urban Center for Computation and Data.[2] They have put a grant application into the National Science Foundation to essentially hang several hundred black boxes filled with very cheap sensors on public infrastructure such as light poles. That platform is open to anybody so you can apply to collect data— mostly environmental data—from this sensor network for the next month. It's like an open data platform for the physical world.

Can making that data collection visible change the way we use public space?

Absolutely. Reading a city is also about knowing what is sensed. For example, the Institute for Applied Autonomy's iSee is a website where you put in a start and an end, and it routes you around the paths of least surveillance. Reality TV in the past 20 years has shown us that the presence of a camera changes how people behave; there is no question about this. However, data is being collected all the time whether we see it or not. When you are walking down the sidewalk, every person has the ability to record you with their phone, Google Glass, or any other device. I don't know if that necessarily changes how I walk down the sidewalk, even though I know that I can be recorded. If you are out in public you are probably being recorded somehow. And I don't know if that has changed peoples' behavior necessarily.
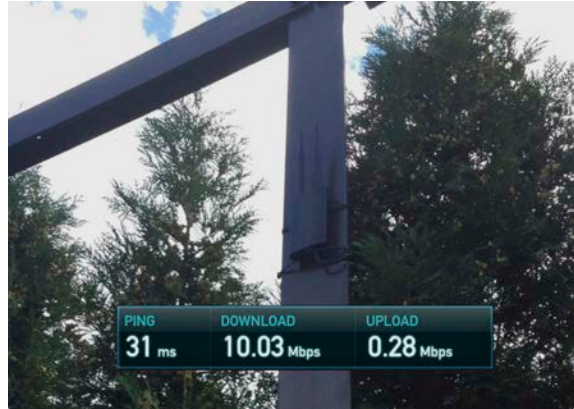
Wi-Fi in Millennium Park, Chicago
© John Tolva

In your talk you mentioned that the presence of Wi-Fi in Millennium Park has changed how people used that public space.

Yes. The first time I thought of this was experiencing the feedback from speakers. Sometimes microphones will have feedback and they create a "safe area." The zone of their space is defined by this technology. In this case it's an error. I think that my kids know, because they don't have cell phones but they do have iPod touches, where all the free Wi-Fi is in the city. They know where the best Wi-Fi is and it does change their patterns. People who have cellphone networks know the good places and the bad places for Verizon or AT&T. I think we have only scratched the surface in terms of how these technologies change how people use space.

It is clear that we are really good at collecting data. But how good are we at interconnecting that data? And not only data with data, but data with other areas of physical planning.

We are not really good at all. For one, there is a technical issue. Information in some cases is not comparable. For example, the term for "land use" in Hong Kong and "land use" in Kansas City is not even the same. If you and I speak different languages but we are medical doctors, we can probably work on a body, diagnose, and fix it. There is a standard nomenclature and procedures. It is not the same with urban planning and that is a problem.

When you look at large systems, or even different counties in Illinois, in some cases it is almost impossible to compare similar sets of data. We don't have the means to compare this data, even if we know how we want to look at it.

I think that is why you get so many technologists and data scientists interested in the city. They are interested because there are so many complex relationships. It is one of the most difficult engineering challenges. They don't care about cities, they aren't civic minded. They are interested in hard problems. In the office there is an astrophysicist working for us. He doesn't know about buildings. In astrophysics, especially radio astrophysics, you are trying to find patterns in billions of data points. He is interested in cities for the same reason.
    But the standard nomenclature I mentioned earlier is just a technical issue. The other issue is that data literacy is very low in the architectural world.

That was actually my next question, data literacy . Some people know how to access and work with data and they are comfortable using it. But others are not and are in a way left out of this. How do we address this issue both at a professional level and a citizen level?

I think we need a better set of tools. What Google Maps has done for location, we need that for data. Imagine the ability of an average person to not even care where the data is, but to basically say "I would like to see economic activity in Humboldt Park versus Lincoln Park." All that data is there, he or she could get that now, but it is not very easy. One way would be to create a middleware layer. The other aspect is that, especially in an increasingly surveilled world, it would be great if there was a way to access the data that you generate in one place. Health care is still trying to figure this out. There is a federal government initiative called Blue Button that whenever you see the button it signals that it is a health care website. It gives you the ability to download your data, the data that you created. I don't know if you have ever tried to move records between doctors. It is a real pain in the butt. As you move through the city you are leaving a data trail and you could argue that that is yours. You can

download all of your Ventra swipes. You can download all of your Divvy trips. But how about every time you swipe into a building, or something like that? That should be protected, but also it should be yours. I think that this is an opportunity for development: ownership of your data trail. I am sure you have heard that just last week, there were these lawsuits in Europe for the right to be forgotten.[3]

Yes. I believe thousands of people have already applied.

It is an incredible technical challenge. Another way to put it is that it is not the right to be forgotten, but the right to control your own data trail. Maybe you decide to delete it.

Privacy is clearly an issue. We basically wake up every day and there is something new about it, like the NSA now collecting millions of faces from the web to use in their facial recognition programs.[4] I know that the information you put on social media is public but…

I think it would be wrong to suggest that the NSA is only using public data. From what I have read they are tapping phones. But, yes.

Let me rephrase that question. How do we, as users, become more aware of the unwanted consequences of releasing all this information publicly?

When we were little, people talked about media literacy. Training kids to read advertisements for what they were, to understand when you are being pitched. Nobody talks about that anymore because every child I know is fully media literate. For the most part, they know how they are being pitched. That initiative worked. I think we need a similar initiative for data literacy, around the consequences of an online world. The other problem is that for a vast majority of business online, like Facebook and others, it is in their best interest to obfuscate the privacy implications of releasing this data. The more people who are exposing more data on Facebook, the better for Facebook and its marketers.

Chicago Central Area Decarbonization Plan
© Adrian Smith + Gordon Gill Architecture.

When a government sector, like NSA, is using this information secretly, and the private sector does not want to be clear about the use of the data they release, who should be in charge of pushing this initiative of data literacy?

It could be that we are moving towards a standardization. Whenever you interact with a site, you can see its security certificate, if it is encrypted. But I don't know any way to go to a website or in a browser and see what its privacy policy is. That would be the first step—to put standards on this. You can put in your browser preferences to not show pop-up ads. But how about "don't ever release my data to marketers." There is the option to turn off the your cookies. But nobody knows what that means. It needs to be much more transparent. The thing is, I don't think that is such a nightmare situation for Facebook and Google because part of this is generational and cultural. Some people just live out in the open. It's a digital exhibitionism in a way. They don't care. But maybe in 20 years that will come back to haunt them when their digital footprint is out there.

You have worked both in the private and public sector. How is data approached from each sector?

The public sector data is seen as being valuable mostly for transparency and accountability, which are things that companies care about, but they have moved past that. Data for companies is really

about analytics, becoming more profitable, saving money, analyzing costs. Now, certain governments like ours have made that leap. But how many hack-a-thons do you hear about where they are actually doing analytics? Not many. They are creating little web apps. We still have
a long way to go in governments really embracing data, really embracing machine learning and analytics to change the way things get done. Partially this is just inertia. So much of politics is instinct, gut, and anecdote. I am not advocating for a kind of robotic or computer controlled government.

At IBM, I was one of the people who tested Watson [a cognitive technology that processes information more like a human than a computer], so I got to play it. The interesting thing about Watson was that is wasn't connected to the Internet. It didn't go out and do Google searches. It actually was given data and then it had to find the patterns of correlation between terms and things like that. That's the promise of data and analytics that the government has just coming to. In general government is behind the private sector in using data.

In terms of Chicago and data, the Chicago Architecture Foundation (CAF) just opened its exhibition *Chicago: City of Big Data*, for which you are part of their advisory board. What are the goals of the exhibition and what are the tools used to engage with people?

The CAF organized it by scale: human, block, neighborhood, and city. I think of it a little differently. How does data, surveillance, and sensors inform city design? How is it actually changing the way that we design cities or how should it? It is similar to the work we do here at Positiv-Energy Practice. The flip side is, how can we learn more about our cities by looking at it through this prism? The CAF is giving a physical walking tour where you are looking at the infrastructure of data: cameras, data centers, and cell phone repeaters. Once you see those elements, you start to see the city in a different way. I think that is good. It also goes to the data literacy point. The Internet does not just rain down from heaven. There is an actual built structure.

Transparency Builds Trust
Accountability Builds Better Workforces
Analysis Builds New Processes
Open Data Builds Businesses

MAS CONTEXT / 22 / SURVEILLANCE

Visualizing Chicago's Building Stock map by Juan-Pablo Velez, Open City (opencity.org)
Chicago: City of Big Data, Chicago Architecture Foundation, 2014 © Iker Gil
Text courtesy of John Tolva

That is what Andrew Blum talks about in his book *Tubes*. Data is physical.

It has a physicality, it has a cost, and it has an aesthetic. If the old wooden water towers on buildings are still there, they are festooned with radio antennas. And sometimes the cistern itself has rotted away so it's just the antennas. What are the implications of that? Should we zone things differently? Should the city take an active role in making it beautiful?

In a lot of cities, Chicago included, old structures that were designed to hold heavy load such as post offices, banks, or printing plants are now chosen to be used to as data centers. The buildings that became obsolete now can be easily re-used for these new technologies.

I think old cities have an advantage because the cost is already embedded. But you have to be creative about thinking about how to reuse that infrastructure. One of the great things about the "L" [Chicago's elevated train system] is that if you want to run fiber, you don't have to dig in the street. You don't have to worry about network repeaters, because you are out in the open as opposed to the NYC subways. I think that's why you don't hear a lot of good stories about smart urbanism from cities that have been built from nothing. There is something about the layering. It has to do with the human engagement with the city. You don't engage with an amusement park or mall because they are fake. They are deliberately fake. The beauty of cities is that there is some friction, they can be dirty, they can be hard to quantify. That's why people like living in them though. And then you overlay this clean, digital interface over the city. The designers of these technologies applied in cities have to be comfortable with them being used in ways that they didn't intend. I guess it is just not the way that computer developers think.

Are there cities that are good examples of data use? What are the factors that make them successful?

Glasgow is doing interesting things and so is Barcelona. In some ways they are not the cities you think. You would think that San Francisco, for instance, would be leading things. They really are not. Most of the tech talent is in the valley, which is very automobile centric. You can argue that there is a lot of smart technology out there, but there is not a lot of urbanism. Everybody drives. There is a reason that the garage is mythic in the valley. In terms of factors, leadership does matter, but it's not even primarily from the government. For example this last weekend [May 31– June1] was the National Day of Civic Hacking and hundreds of cities participated. It turns out that Detroit has tons of local data, it just wasn't collected by the government. There were people outside of the government that needed this data for whatever their thing is, and they built it up themselves on the edges of city government. That is probably the most important thing: leaders in the community.

Definitely a key group to identify. Thank you very much for sharing your insight about data and cities. A complex and fascinating topic.

My pleasure.

1 "Apple Releases iOS 8 SDK With Over 4,000 New APIs," *Apple*, June 2, 2014,apple.com/pr/library/2014/06/02Apple-Releases-iOS-8-SDK-With-Over-4-000-New-APIs.html.

2 UrbanCCD's mission is to catalyze and pursue an interdisciplinary research agenda in urban sciences aimed at increasing our understanding of cities and our ability to anticipate the effects of rapid global urbanization on natural, built, and socioeconomic systems. "Our Center," *Urban Center for Computation and Data*, accessed June 2, 2014, urbanccd.org/our-center.

3 European Parliament legislative resolution of 12 March 2014 on the proposal for a regulation of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and on the free movement of such data (General Data Protection Regulation) (COM(2012)0011 – C7-0025/2012 – 2012/0011(COD)) (Ordinary legislative procedure: first reading). "Texts Adopted," *European Parliament*, May 12, 2014, europarl.europa.eu/sides/getDoc.do?type=TA&reference=P7-TA-2014-0212&language=EN.

4 James Risen and Laura Poitras, "N.S.A. Collecting Millions of Faces From Web Images," *New York Times*, May 31, 2014,nytimes.com/2014/06/01/us/nsa-collecting-millions-of-faces-from-web-images.html.

Real-Time Data
City Fleet Locations
Public Transit (Trains, Buses,
Metra City-Specific Social Media)

Scheduled Interaction
Street Upgrade
Infrastructure Upgrade
Utilities Work
Large-Scale Projects

Historical Data
Service Requests
Crime Reports
Building Permits and Use-Types Business Licenses
Zoning and Parcel Improvements
Services Requests and Fulfillment Violation History
Inspection History
Health Code Violations

Types of Data. Text courtesy of John Tolva

Surveillance by Alex Fuller
Sneaky creepy behind a book.

Ring of Steel

Project by photographer
Henrietta Williams
and mapmaker George Gingell

Text by
Henrietta Williams

Up to 4 million CCTV cameras trace and capture the movements of people across Britain every day. Governments are increasingly structuring our urban environments around the idea of the panopticon. We now live in a society in which we are unwittingly ordered and controlled, where security and safety are paramount. Our project seeks to demonstrate the pervasive nature of surveillance society in the UK.

This approach to urban planning, often referred to as "fortress urbanism," draws on defense initiatives from conflict zones and applies them within civilian locations. The Ring of Steel was first created in 1993 to protect the City of London from the threat of terrorism after the Irish Republican Army(IRA) had identified the capitalist financial center as a perfect target for their bombing campaign.

Yet this is not the first time the area has had to be fortified against attack. The Ring of Steel lies alongside and intersects the ancient London Wall, first constructed by the Romans. Instead of bricks and stone, this contemporary defense system uses CCTV cameras, sentry boxes, bollards, one-way systems,and flower planting. The old street patterns have been redrawn to create a new urban plan that is easy to police. Anonymous non-places are generated to discourage citizens from lingering. People and conventional activities are removed from the streets, unwanted in a new world where surveillance is paramount.

Our project uses maps and photographs to make visible the function, nature, and effect of the Ring of Steel, its role as a panopticon, and demonstrates how it follows an ancient line of defense whilst deploying a very twenty-first century approach to control.

Entry Point CCTV and Sentry Box

Exit Point CCTV
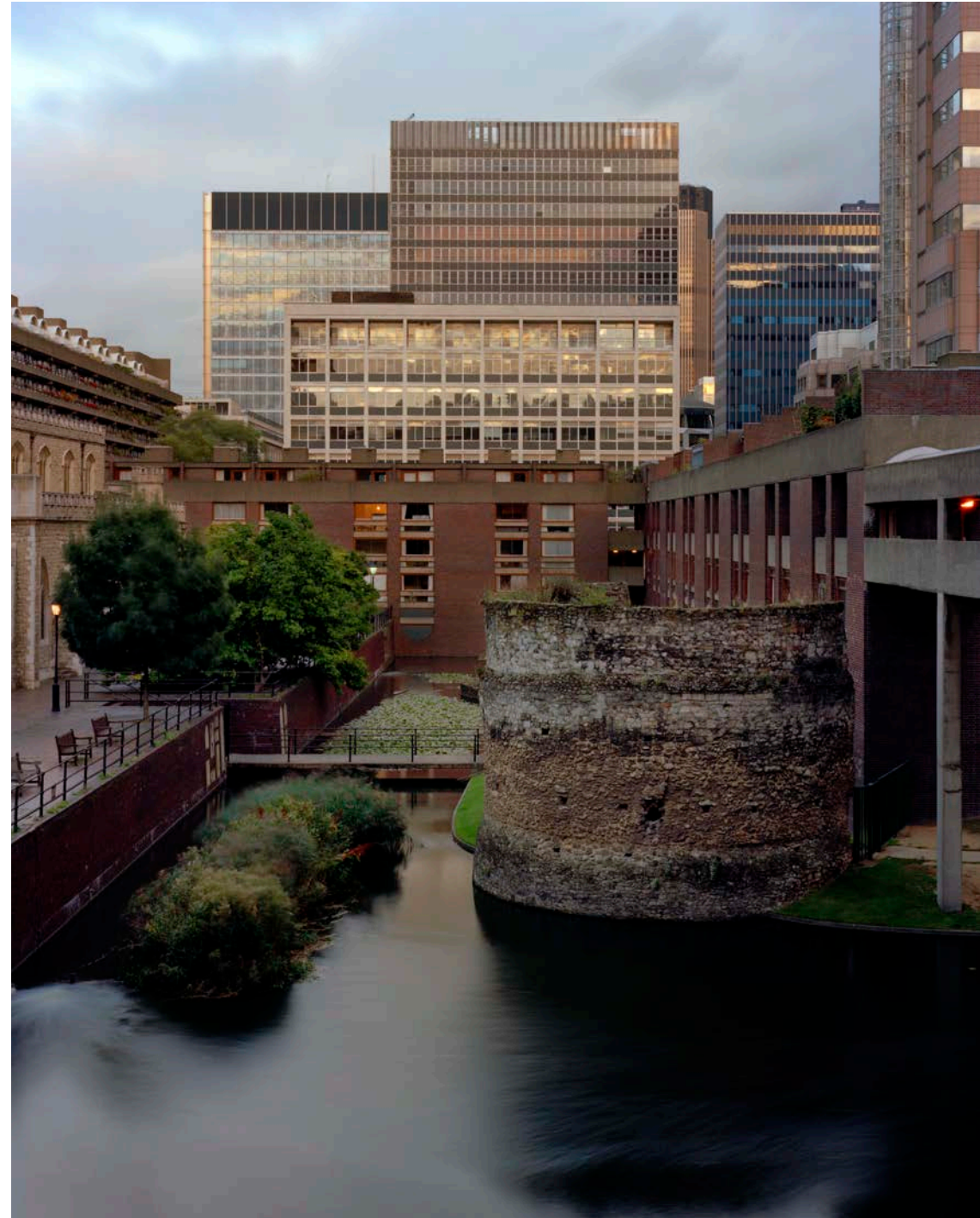
Road Block

One Way Road

New Fetter Lane, 2010
Sentry box and CCTV cameras for number plate recognition.
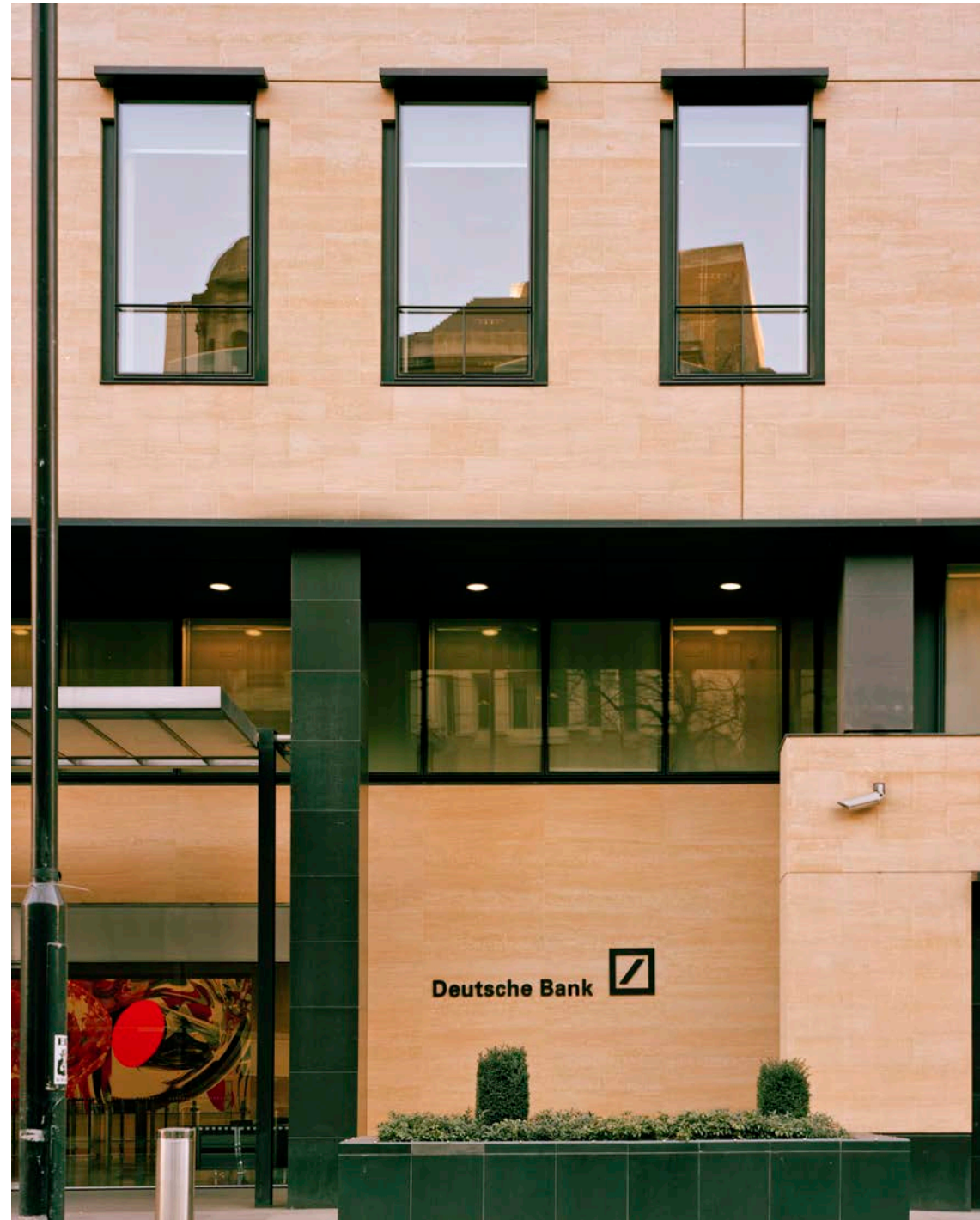
Barbican, 2010
Remnants of London Wall.

Snowden Street, 2010
Bollards and privatized road.

Mark Lane, 2010
Tree planting and road blockage.

Deutsche Bank, London Wall, 2011
Flower planters made of reinforced steel and concrete with a granite finish.
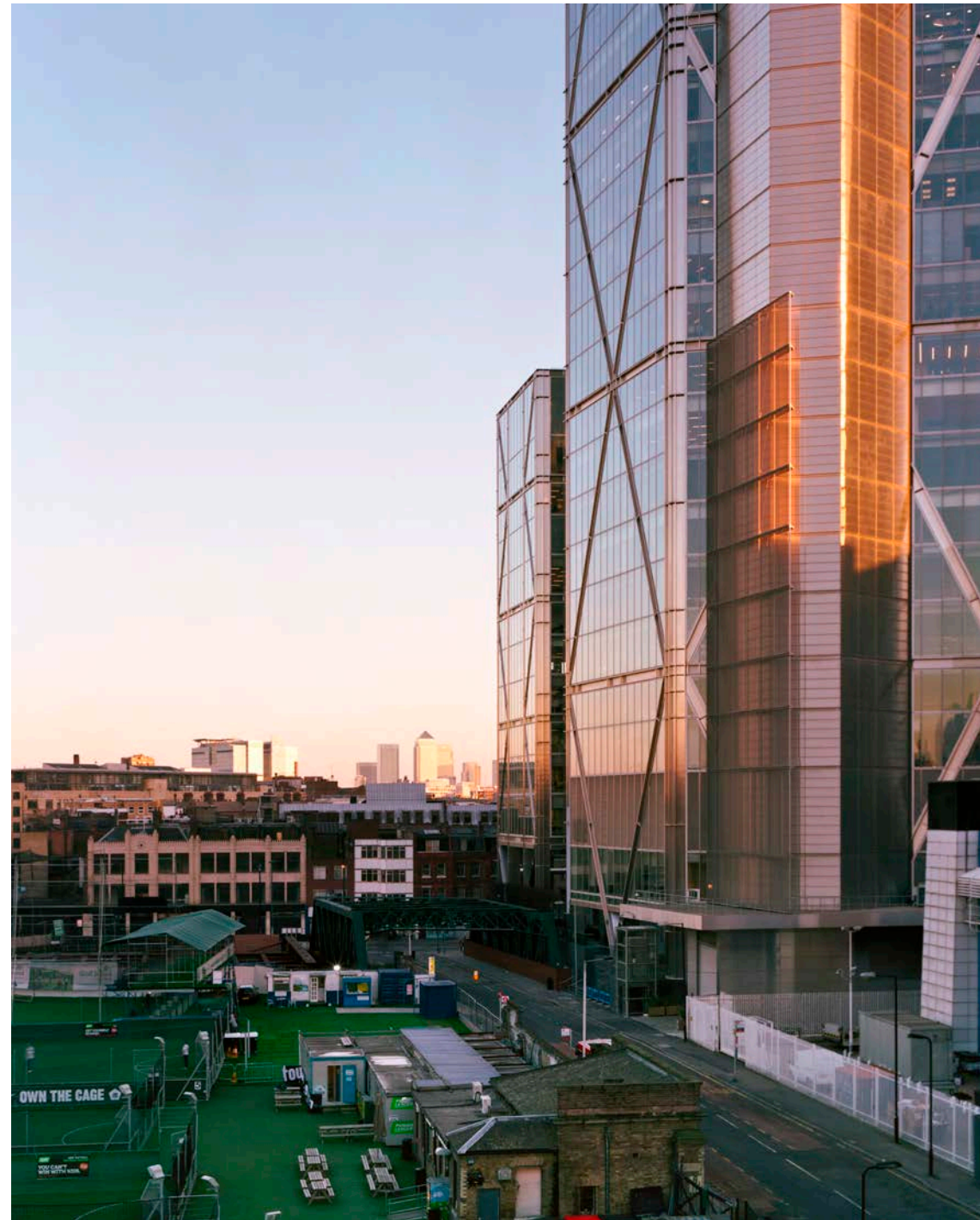
1 London Wall, 2011
Remnants of London Wall.

Spital Square, 2010
Private CCTV camera within the Ring of Steel.

Merrill Lynch, King Edward St, 2010
Roman remains of the London Wall lie in the basement of Merrill Lynch Bank.

Broadgate Tower, 2011
The edge of the City of London, to the left is the beginning of the borough of Hackney.

Surveillance by Alex Fuller
Sneaky creepy takes a look.

**Manifesto
for CCTV Filmmakers** declares a set of rules, establishes effective procedures, and identifies issues for filmmakers using pre-existing CCTV (surveillance) systems as a medium in the UK.
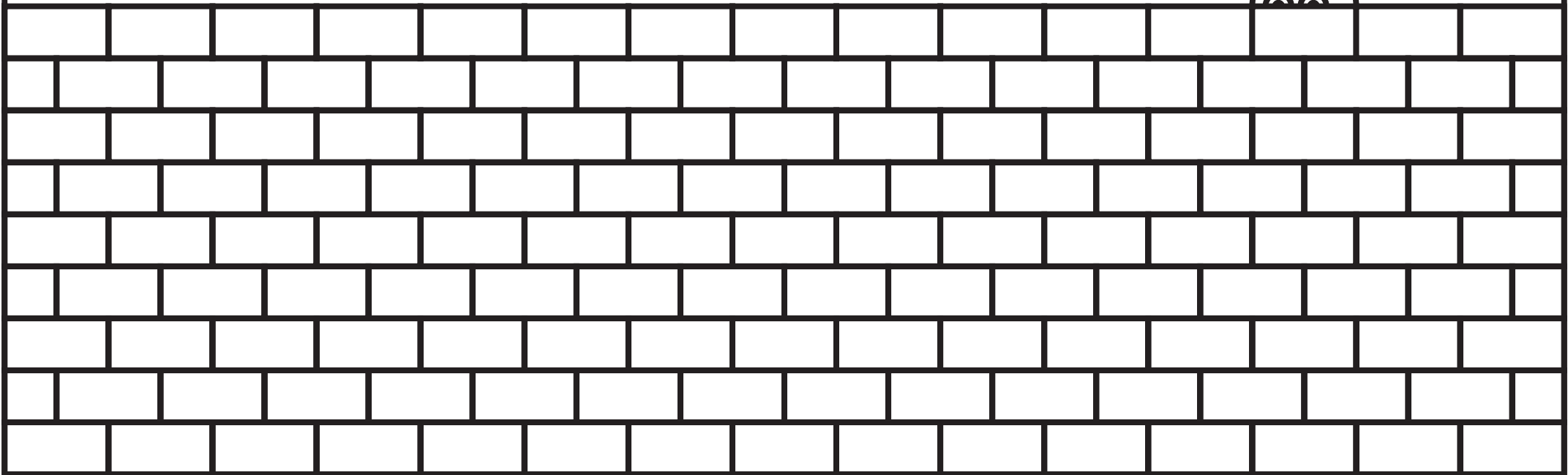
**The Filmmaker as Symbiont:
Opportunistic Infections
of the Surveillance Apparatus**

**Manifesto by
Ambient Information Systems**

The manifesto is constructed with reference to the Data Protection Act 1988 and related privacy legislation that gives the subjects of data records access to copies of the data. The filmmaker's standard equipment is thus redundant; indeed, its use is prohibited. The manifesto can be adapted for different jurisdictions.

ambientTV.NET

General
The filmmaker is not permitted to introduce any cameras or lighting into the location.

Script
A protagonist ("data subject") is required to feature in all sequences.
Data Protection Act 1998; 1998 Chapter 29; Part II Section 7(1). **
[A]n individual is entitled:
(a) to be informed by any data controller whether personal data of which that individual is the data subject are being processed by or on behalf of that data controller,
(b) if that is the case, to be given by the data controller a description of –
    (i) the personal data of which that individual is the data subject,
    (ii) the purposes for which they are being or are to be processed, and
    (iii) the recipients or classes of recipients to whom they are or may be disclosed,
(c) to have communicated to him in an intelligible form:
    (i) the information constituting any personal data of which that individual is the data subject, and
    (ii) any information available to the data controller as to the source of those data,
(d) where the processing by automatic means of personal data of which that individual is the data subject for the purpose of evaluating matters relating to him such as, for example, his performance at work, his creditworthiness, his reliability or his conduct, has constituted or is likely to constitute the sole basis for any decision significantly affecting him, to be informed by the data controller of the logic involved in that decision taking.

The documented activity of the protagonist must qualify as personal or sensitive data. The filmmaker is to establish this by locating a CCTV camera and circumscribing the field of action for the actors relative to it, so that incidents of biographical relevance (i.e., that reveal personal data) occur in the frame.
ICO CCTV systems and the Data Protection Act JB v.5 01/02/04 ***
2. The court decided that for information to relate to an individual (and be covered by the DPA) it had to affect their privacy. To help judge this, the Court decided that two matters were important: that a person had to be the focus of information, the information tells you something significant about them.

The provisions of the 1998 Act are based on the requirements of a European Directive, which at, Article 2, defines, personal data as follows:
"Personal data" shall mean any information relating to an identified or identifiable natural person; an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity. The definition of personal data is not therefore limited to circumstances where a data controller can attribute a name to a particular image. If images of distinguishable individuals' features are processed and an individual can be identified from these images, they will amount to personal data.

All people other than the protagonist ("third parties") will be rendered unidentifiable on the data obtained from the CCTV operators. Typically, operators blur or mask out faces of third parties. The filmmaker is to consider the visual impact of this manipulation, and to establish a rule for the handling of footage delivered with ineffectual masking or blurring—for example, reporting the offense.

Right to Privacy in Article 8 of the Human Rights Act 1998:
RIGHT TO RESPECT FOR PRIVATE AND FAMILY LIFE
1. Everyone has the right to respect for private and family life, his home and his correspondence.
2. There shall be no interference by a public authority with the exercise of this right except such as in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic well being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights or freedoms of others.
DPA1998
4. On the other hand, the disclosure of third party information in compliance with a subject access request may also expose the data controller to complaint or action by the third party, for example … for breach of confidence.
6. The data controller should consider to what extent it is possible to communicate the information sought without disclosing any third party information … This might be achieved by editing the information to remove names or other identifying details.

Location
The filmmaker is to choose locations covered by multiple cameras operated by a large business, private security firm or public authority—or, if operated by a small retailer, cameras that can be panned or zoomed remotely. Locations may be mobile (e.g., public bus).
ICO CCTV systems and the Data Protection Act JB v.5 01/02/04
If you have just a basic CCTV system your use may no longer be covered by the DPA.
Small retailers would not be covered who
– only have a couple of cameras,
– can't move them remotely,
– just record on video tape whatever the camera picks up,
– only give the recorded images to the police to investigate an incident in their shop.

For every camera, the operator's name and contact details are to be noted.
Code of practice issued by the Data Protection Commissioner, under Section 51(3)(b) of the Data Protection Act 1998, 07/2000 *****
7. Signs should be placed so that the public are aware that they are entering a zone which is covered by surveillance equipment. The signs should contain the following information: identity of the person or organization responsible for the scheme, the purposes of the scheme, details of whom to contact regarding the scheme. (First Data Protection Principle).

Footage Requests
After each shoot, the filmmaker is to send a written request ("subject access request letter") to the CCTV operator ("data controller") to ensure that the data recovery process can be initiated while the recordings are still archived. (Mandatory retention periods vary.)
Code of practice issued by the Data Protection Commissioner, under Section 51(3)(b) of the Data Protection Act 1998, 07/2000
1. Once the retention period has expired, the images should be removed or erased (Fifth Data Protection Principle).

The subject access request letter is to state the place and time of the recording and include a picture of the protagonist (wearing the same clothes if possible) and a cheque for £10 (the maximum fee chargeable). Letters should be sent by a secure system that provides evidence of delivery. (Some data controllers may require the notarisation of the letter to legally establish identity.)
Data Protection Act 1998; 1998 Chapter 29, Part II Section 7(2)
A data controller is not obliged to supply any information under subsection (1) unless he has received:
(a) a request in writing, and
(b) except in prescribed cases, such fee (not exceeding the prescribed maximum) as he may require.

The filmmaker is to allow a maximum 40 days after sending the data request for an initial response.
Code of practice issued by the Data Protection Commissioner, under Section 51(3)(b) of the Data Protection Act 1998, 07/2000
A data controller must comply with a subject access request promptly, and in any event within forty days of receipt of the request or, if later, within forty days of receipt of: the information required (i.e. to satisfy himself as to the identity of the person making the request and to locate the information which that person seeks); and the fee.

The filmmaker is to establish a set of rules for handling the various formats in which the data may be sent (video tape, DVD-video, digital files encoded with proprietary codecs, hard copies of frames, etc.).

Sound
CCTV systems are not permitted to record sound. The filmmaker is to establish a set of rules for the soundtrack (if any) of the movie.

Distribution
Footage received is subject to complex copyright issues. The filmmaker is to take legal advice and establish a strategy.

*
In addition to the boom in surveillance, the proliferation of miniature mobile cameras (many built into phones and other handheld devices) has led to the phenomenon of "sous-veillance" activities carried out by the population at large. News services now actively solicit amateur recordings from camcorders and even mobile phones, often combining them with CCTV footage where they have access to it, when reporting from scenes of crimes, accidents or natural disasters. The manifesto can be extended to provide a framework for films that work with acts of sous-veillance.
**
Data Protection Act 1998 Chapter 29
opsi.gov.uk/ACTS/acts1998/19980029.htm
***
CCTV systems and the Data Protection Act JB v.5
informationcommissioner.gov.uk
****
Article 8 of the Human Rights Act 1998 (CCTV and the Human Rights Act)
crimereduction.gov.uk/cctv13.htm
*****
CCTV Guidance and the Data Protection Act - Good Practice Note
informationcommissioner.gov.uk/eventual.aspx?id=5740

RECEIVED
-2 SEP 2003

MANU LUKSCH

28 August 2003

The security and safety manager,
Barclays Head Office

Dear Sir / Madam,

I wish to apply, under the Data Protection Act, for any and all CCTV images of my person held within your system. On 27 August 2003, I was present at the ATM 254 Seven Sisters Road, at approx. 20.15 p. m.

For case of identification, I enclose a photo of myself below. I was wearing white trousers and a white T-Shirt with aqua blue sleeves.

[Your full address]
[The date]
[Receiver's full address]

Dear Sir or Madam,

I wish to apply, under the Data Protection Act, for any and all CCTV images of my person held within your system. I was present at [place] from approximately [time] onwards on [date]. For ease of identification, I enclose a photo of myself.

As you will be aware, the DPA CCTV Code of Practice stipulates that £ 10.00 is the statutory maximum fee for a subject access request. Any additional costs over the statutory fee incurred for provision of the service must be absorbed by yourselves. You will also be aware that the Code of Practice stipulates a prompt reply and in any event, within 40 days of this request. I would appreciate it, therefore, if you would inform me of your fee, to whom it is due, and your preferred method of payment.

Should you require further clarification regarding your statutory duties under the DPA, I suggest you contact:

Information Commissioner's Office (ICO)
UK helpline 0303 123 1113
http://ico.org.uk

Should you require any further information to assist you in identifying my image, please provide me with your standard access request form.

Meanwhile please ensure that all tapes between the above mentioned dates are preserved unaltered. I look forward to hearing from you soon.

Yours faithfully
[signature]

Faceless

Amour Fou Filmproduktion and Ambient Information Systems
Present
A film by **Manu Luksch**
Voice **Tilda Swinton**
Soundtrack **Mukul**
Piano Music **Rupert Huber**

Faceless was produced under the rules of the "Manifesto for CCTV Filmmakers." The manifesto states, amongst other things, that additional cameras are not permitted at filming locations, as the omnipresent existing video surveillance (CCTV) is already in operation.
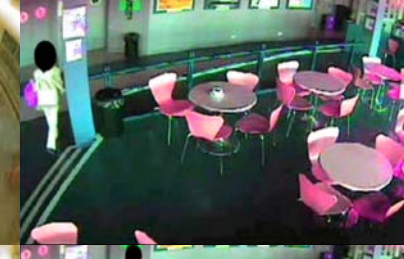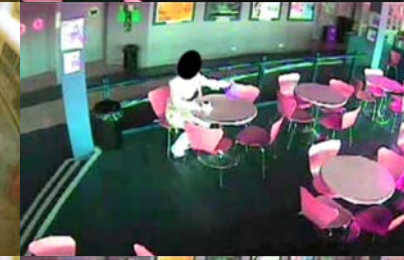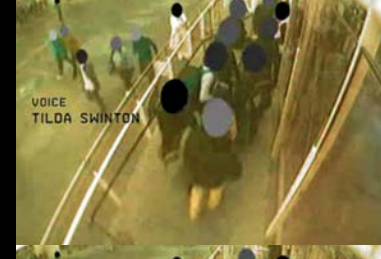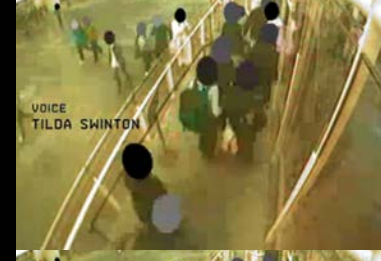
London has the highest density of CCTV surveillance cameras in the world. The UK Data Protection Act and EU Directives gives you the right to access personal data held in computer databases. This includes CCTV recordings.

For more than 13 years I have been tracing the spheres
of public webcams: cameras installed in public or private
spaces that automatically record images and spread them
via the Internet.

I research where they are located, travel there,
and get myself photographed. I was in New York and Moscow,
in Las Vegas, London, and Novosibirsk. I went to more than
600 webcams in 17 countries. So far.

In New York, I was taken into police custody after
standing around in front of a traffic webcam, later to be
interrogated by the FBI.

Once I arrive at a webcam location, I place myself
in front of the camera. As *The Traveller*, I stare back into the
camera. Same clothes, same pose, every time. A bright shirt
and a shoulder bag. You can recognize me in every image.
You can watch me.

The Traveller

I contact a photographer to take my picture with
a screenshot to preserve the transmitted data.

A lot of questions arise. Who sets up these automated
cameras, and why? What do they show? Are people aware
of them? Who needs these images? Who looks at them? Does
the presence of a camera alter a site? What constitutes
a photographic image in terms of authorship or quality?

The Traveller project examines borders of private and
public grounds, global spread of imagery between irrel-
evance, information and surveillance, and the aesthetics
involved.

Among many other places, *The Traveller* encountered the
legendary coffee machine the world's first webcam was pointed
at, the European Space Agency (ESA) main control room, a huge
cactus observed by four cameras, numerous street corners
and backyards, and the inside of a New York police station—
arrested for strange behavior.

Project by
Jens Sundheim and
Bernhard Reuss

Franklin D. Roosevelt Drive #10
New York City, USA
2002

Monday, September 09, 2002   FDR Dr @ 78 Street   5:05:22 PM

Centre Equestre Les Arnelles
Saintes Maries de la Mer, France
2012

Boardwalk
Belmar NJ, USA
2002

Front Door
Dortmund, Germany
2007

Fondation Beyeler
Basel, Switzerland
2004
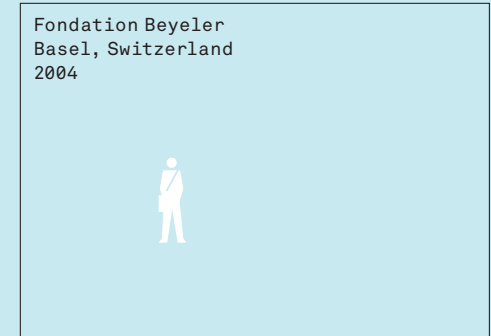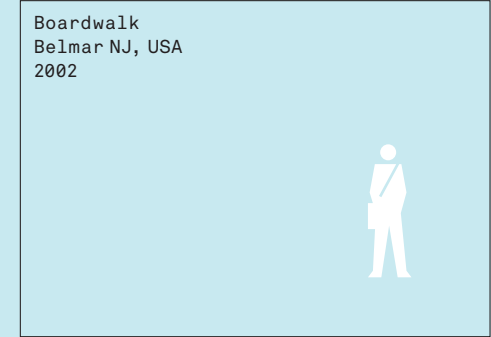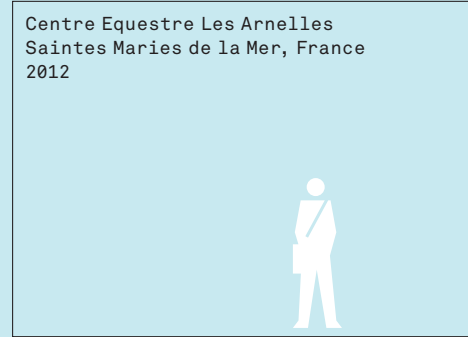
Frenckell Square
Tampere, Finland
2005

European Space Operations Centre
Darmstadt, Germany
2006

Garden Door
Eggersdorf, Germany
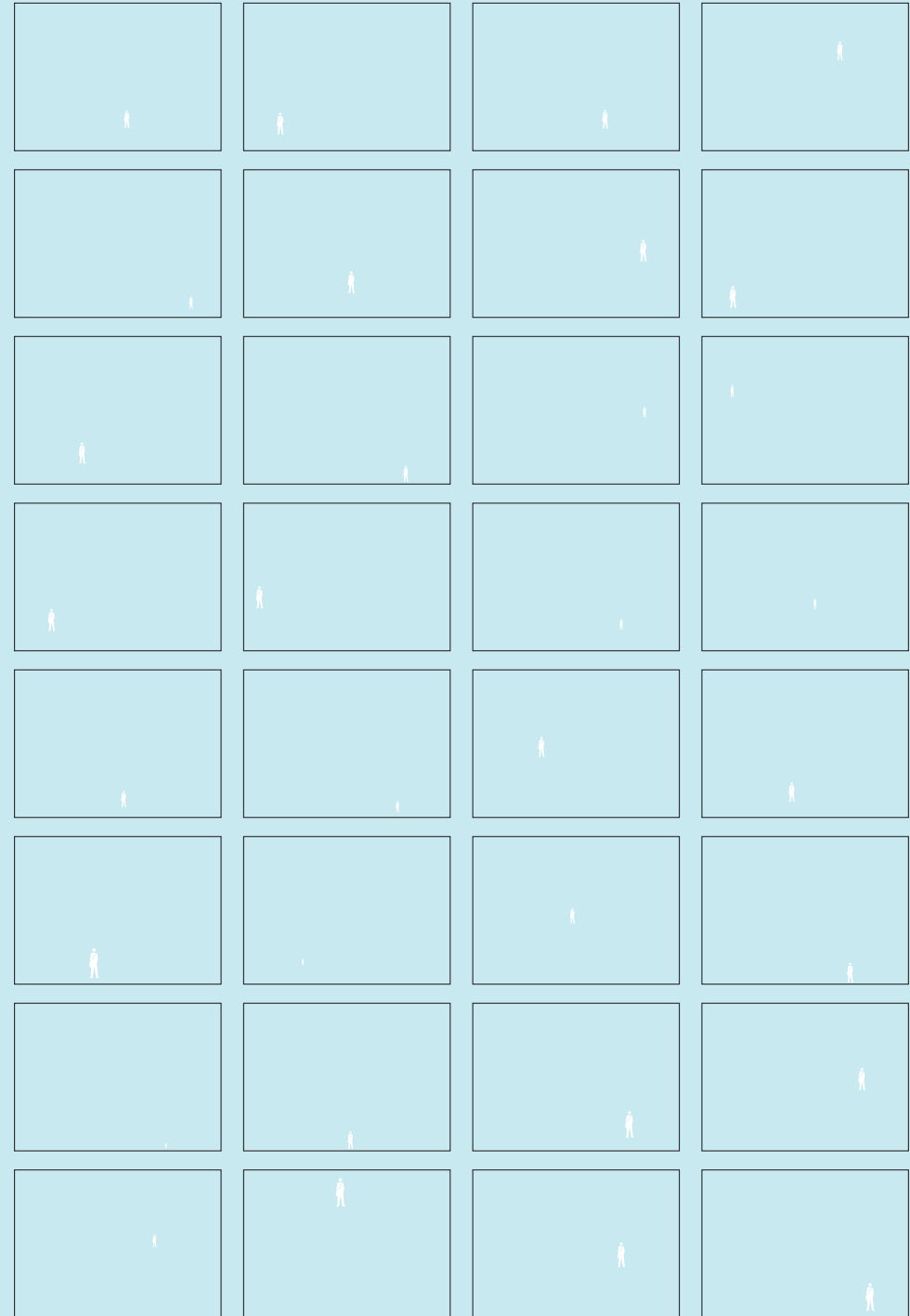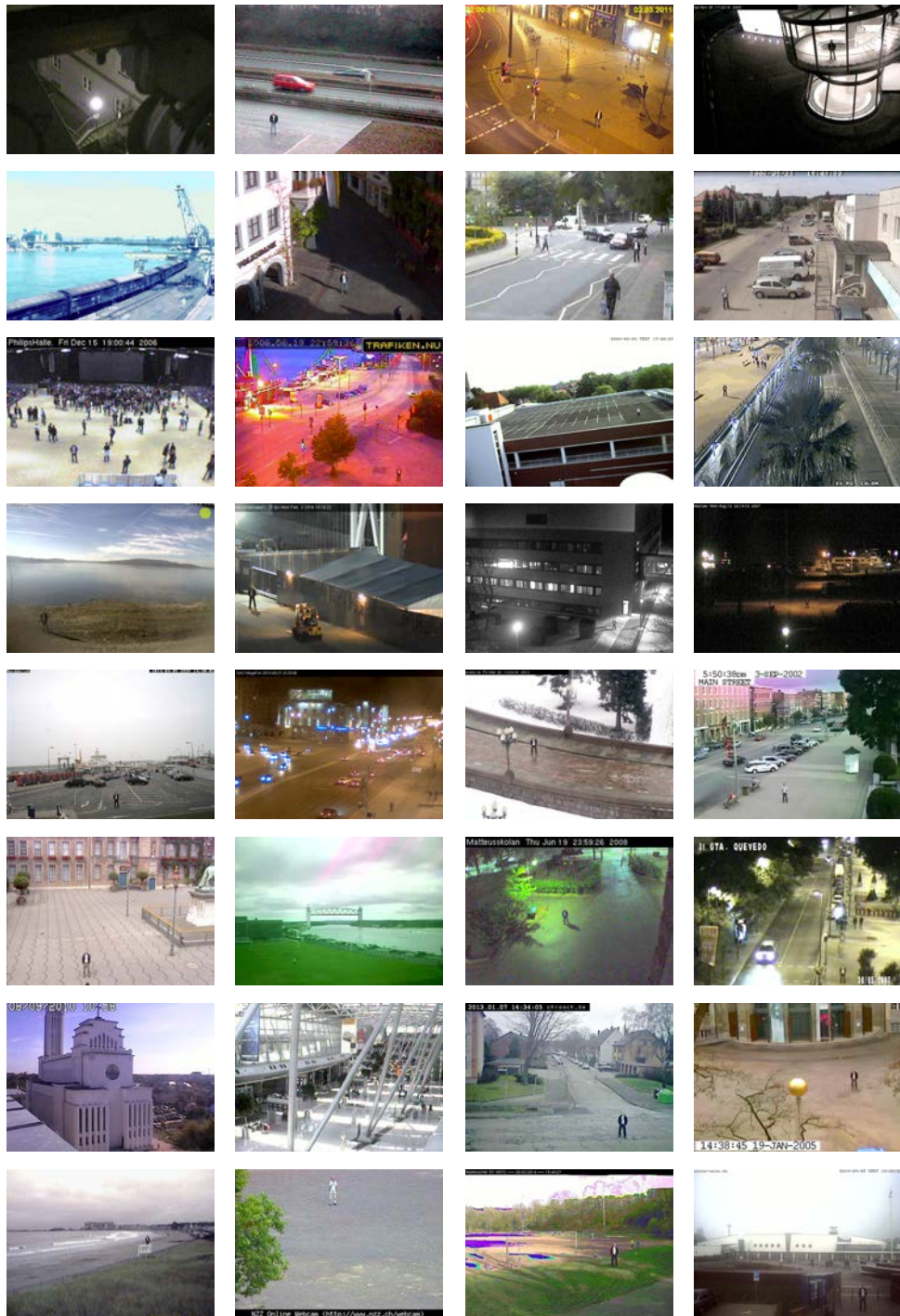2006

Haus des Meeres
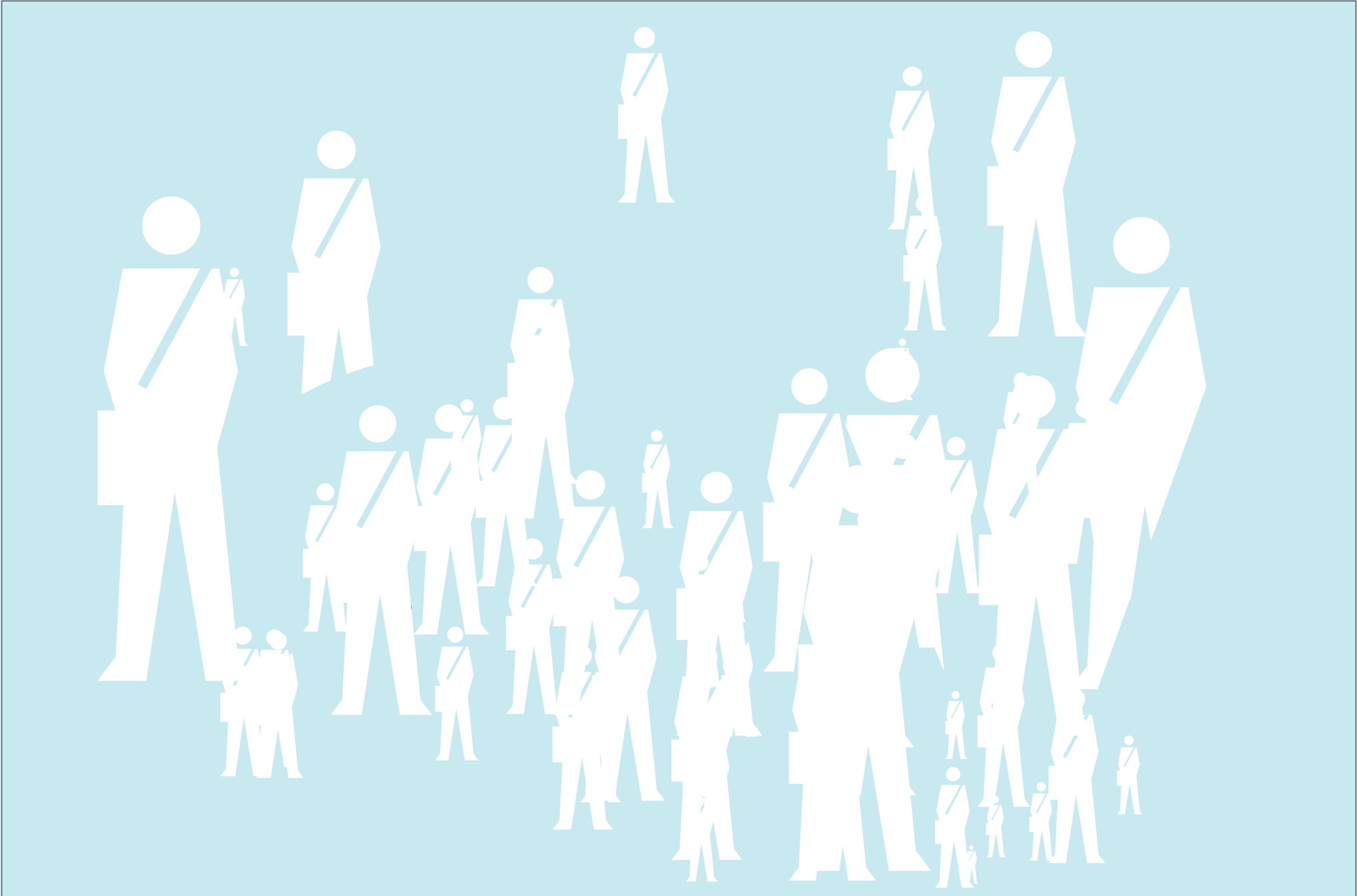Vienna, Austria
2012

Vaduz
Liechtenstein
2003

Golfpark
Otelfingen, Switzerland
2003

The Quay
Poole, England
2004

Aubagne
France
2003

Surveillance by Alex Fuller
Sneaky creepy stares at night.
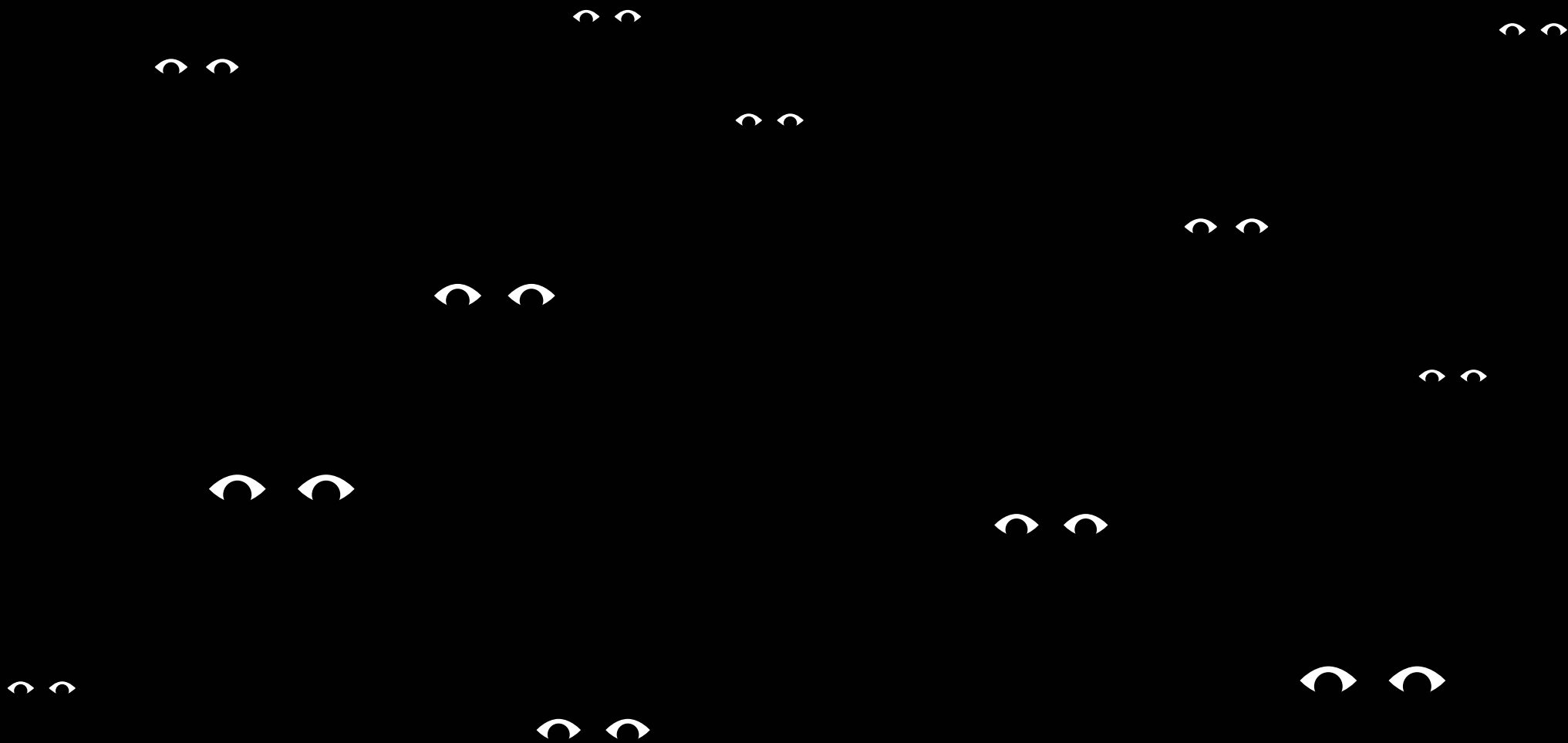
Politicians Under Surveillance

Project by Luzinterruptus
Photographs by Gustavo Sanabria

Politicians are under suspicion. As citizens, we witness in astonishment their maneuvers to curb a crisis for which they constantly try to put the blame on us.

But in reality, those that truly keep them under strict surveillance are the markets, loaded with unlimited power that allows them to overthrow legitimate governments, imposing in their place a race of technocrats with suspicious pasts in the service of the crisis.

With these things in mind, on November 19, 2011, a day of reflection before the general elections in Spain, we took to the streets of Madrid in order to present a simulation of the surveillance of politicians with the aim of generating a debate, or simply a thought, among the people who strolled through the streets on their way back home.

For our installation *Politicians Under Surveillance*, we carried 75 fake security cameras with us, of the type that detect movement and possess an intermittent red light. We attached them to the advertising displays used by the different political parties in their electoral campaigns, observing from close-up the faces of the politicians that were digitally touched up for official photos.

It was an interesting night and, as with previous installations, people asked us about it. We hope we made them reflect for a moment about this alarming situation of the harassment of democracy.
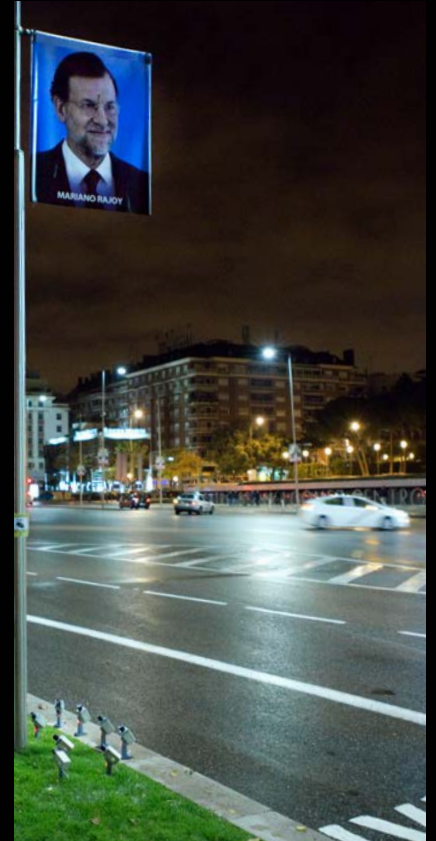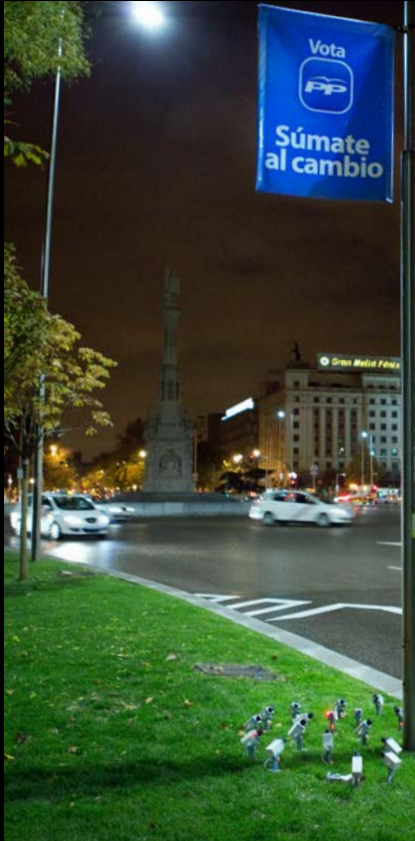
Many thanks to Alex and Cris for helping us, especially with the logistics.

Time of installation: 4 hours
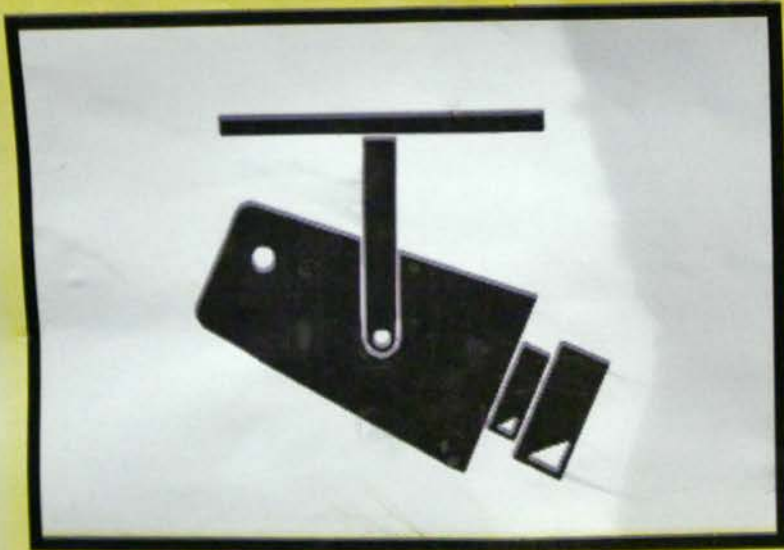Damages: none
Exhibition time: 10 hours

POLÍTICO VIDEOVIGILADO

LEY ORGANICA 15/1999, DE PROTECCIÓN DE DATOS

PUEDE EJERCITAR SUS "DERECHOS" ANTE:

NO SE SABE QUIÉN...

Surveillance by Rick Valicenti WITH BAOZHEN LI / THIRST
Big Brother 1984 comes face to face with the *Tank Man*
1989 within a ring of the US Presidential stars. According to
Wikipedia, the *Tank Man*, is the nickname of an anonymous
man who stood in front of a column of tanks the morning after
the Chinese military had suppressed the Tiananmen Square
protests on June 5, 1989 by force.

INTELLIGENCE ARTIFACTS

The Enigma cipher machine. The pigeon camera. The CORONA film. The Eisenhower "silver dollar" concealment device. The dragonfly insectothopter. These are just five objects that the CIA Museum stores in its 6,000-artifact collection covering the Office of Strategic Services (CIA's predecessor), foreign intelligence organizations, and the CIA itself. Created in 1972 on the Agency's 25th anniversary, the goal of the CIA Museum is to "inform, instruct, and inspire."[1]

The following selection focuses on several artifacts that were designed and used for intelligence operations during the twentieth century.

000-U-2-FC
U-2 FILM CANISTER
Original canister of U-2 film from one of the first flyovers of Russia on July 5, 1956. U-2 cameras had the finest lenses in the world and could see objects on the ground just two feet across from an altitude of more than 12 miles.

1. "CIA Museum," Central Intelligence Agency, accessed May 19, 2014, cia.gov/about-cia/cia-museum.

**001-SD-HC**
"SILVER DOLLAR"
HOLLOW CONTAINER
This coin may appear to be an Eisenhower silver dollar, but it is really a concealment device. It was used to hide messages or film so they could be sent secretly. Because it looks like ordinary pocket change, it is almost undetectable.
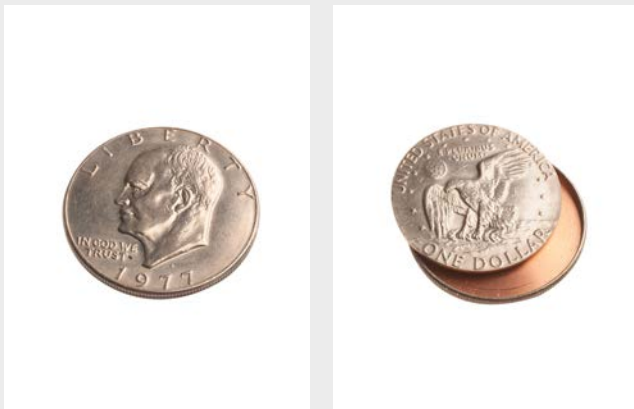
002-LRD
LETTER REMOVAL DEVICE
Special devices were used in World War II to take letters from their envelopes without opening the seals. The pincer-like device was inserted into the unsealed gap at the top of an envelope flap. One could then wind the letter around the pincers and extract the letter from within.
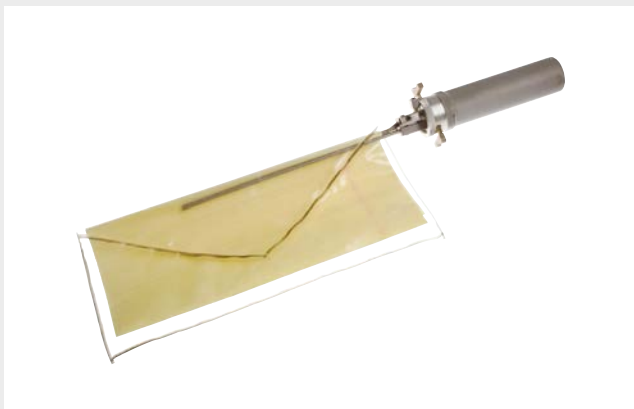
003-CF
CORONA FILM
CORONA is America's first successful photographic reconnaissance satellite. When introduced in the 1960s, it revolutionized the collection of intelligence. CORONA's first mission in August 1960 provided more photographic coverage of the Soviet Union than all previous U-2 missions. Satellite imagery was used for a variety of analytical purposes—from assessing Soviet military strength to estimating the size of their grain production. CORONA and its successors made Soviet-American strategic arms control agreements possible.


001-SD-HC

002-LRD

003-CF

004-RRC
RADIO RECEIVER CONCEALMENT
A subminiature radio receiver is concealed in this modified pipe. The user hears the sound via "bone conduction" from the jaw to the ear canal.

005-M-209
M-209
The M-209 is a mechanical cipher device. Designed by Boris Hagelin, the machine was widely used by the US Army during World War II. Compact and portable, it used a series of rotors to encode and decode secret military messages.

004-RRC

005-M-209

006-CC
CONCEALED COMPASS
American servicemen going into harm's way had a variety of ingenious places to hide small, even miniature, compasses for escape and evasion—in combs or razors, uniform buttons or, as seen here, in cufflinks.
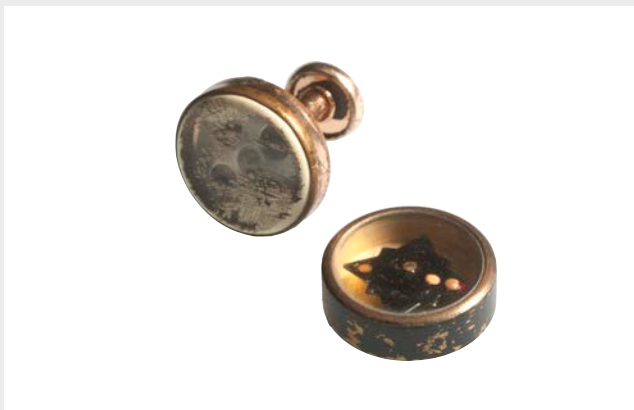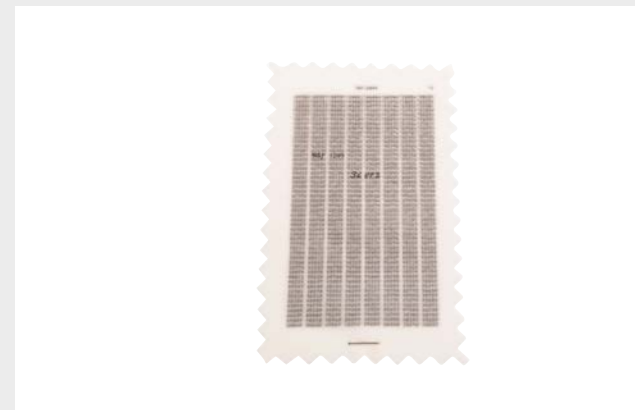
007-CD-MLMC
CONCEALMENT DEVICE (MODIFIED LADIES MAKE-UP COMPACT)
A code is a system of communication in which groups of symbols represent words. Codes may be used for brevity or security. Here, a code is concealed inside the mirror of a lady's make-up compact. By tilting the mirror at the correct angle, the code is revealed.

006-CC

007-CD-MLMC

008-OTP

009-DDS

008-OTP
ONE-TYPE PADS
One-time pads (OTP) are used to encode/decode agent communications. They are issued in match-ing sets of two: one for the encoder and one for the decoder, and no two pages are alike. Each sheet contains a random key in the form of five-digit groups. Once a sheet has been used to encode a message, it is torn off the pad and destroyed. If used as designed, encryption by OTP is virtually unbreakable.

009-DDS
"DEAD" DROP SPIKE
Communication between an agent and his/her handler always poses a risk. A "dead" drop allows secure communication by one person leaving and later the other person picking up material at a prearranged location. This elimi-nates the need for direct contact. This device is a spike that one could push into the ground. It is hollow in the middle and could contain messages, documents, or film.

010-BSE
**BODYWORN SURVEILLANCE**
EQUIPMENT
An intelligence officer's clothing, accessories, and behavior must be as unremarkable as possible — their lives (and others') may depend on it. This is a responsibility that operational artisans, technicians, and engineers of the Office of Technical Readiness (OTR) take seriously. America's intelligence officers can safely collect intelligence in hostile environments because they know that quality and craftsmanship have been "built in" to their appearances, leaving no traces to alert the enemy.

011-EM
ENIGMA MACHINE
During World War II, the Germans used the Enigma, a cipher machine, to develop nearly unbreakable codes for sending messages. The Enigma's settings offered 150,000,000,000,000,000,000 possible solutions, yet the Allies were eventually able to crack its code. By end of the war, 10 percent of all German Enigma communications were decoded at Bletchley Park, in England, on the world's first electromagnetic computers.

010-BSE
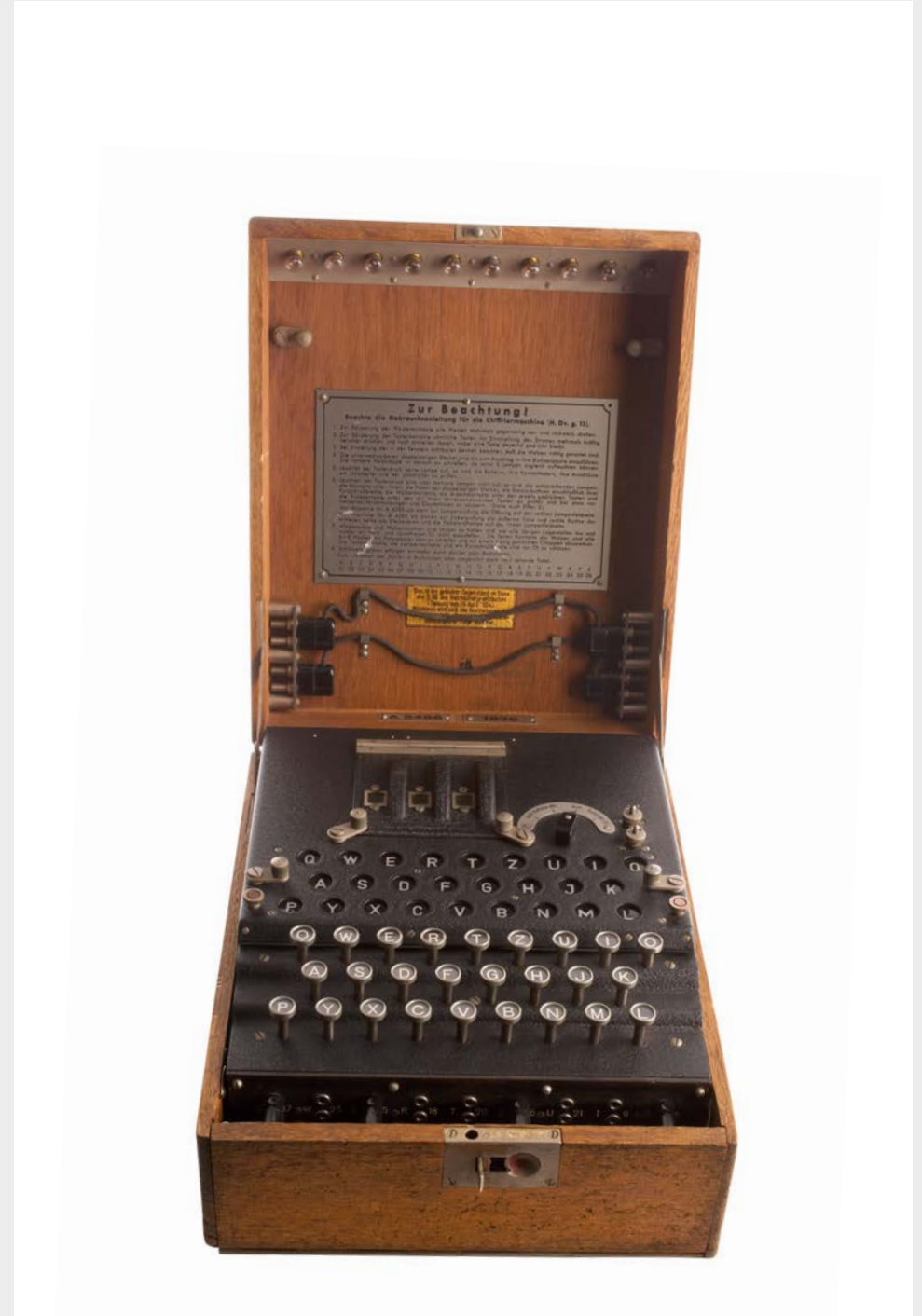
011-EM

012-AFSK
ADVANCED FLAPS
AND SEALS KIT
In this "flaps and seals" kit for
advanced users, tools handmade
of ivory in a travel roll were used
for the surreptitious opening
of letters and packages during
the 1960s.

012-AFSK

013-TC-CP
**TESSINA CAMERA CONCEALED
IN CIGARETTE PACK** Miniature
spring-wound 35-mm film cam-
era in a modified cigarette pack.
The Tessina's small size and quiet
operation provided more options
for concealment than most com-
mercially available models.

014-TPC
TOBACCO POUCH CAMERA
A miniature 35mm film camera
manufactured in Switzerland
is concealed in this modified
tobacco pouch. A spring-wound
mechanism advances the film
between exposures.

015-MC
"MATCHBOX" CAMERA
The Eastman Kodak Company
developed and manufactured this
camera for use by the Office of
Strategic Services (OSS). It was
made in the shape of a matchbox
of that era. It could be disguised
by adding a matchbox label ap-
propriate for the country in which
it was to be used.

013-TC-CP

014-TPC

015-MC

016-MC
MICRODOT CAMERA
The secret transfer of documents
became very difficult during the
Cold War. Agents relied on the
microdot camera to photograph
and reduce whole pages of infor-
mation onto a single tiny piece of
film. This piece of film could be
embedded into the text of a letter
as small as a period at the end of
this sentence. Microdots were
also hidden in other things such
as rings, hollow coins, or other
mailed items. The recipient would
read the microdot with the aid
of a special viewer, often cleverly
concealed as well.

017-M-DU-C
**SUBMINIATURE
"DUAL USE" CAMERA**
This subminiature camera isn't
much larger than its film cassette.
It could be used to photograph
both documents at close range
and building sites at a distance.

018-MC
MINOX CAMERA
Walter Zapp, a Latvian engineer,
developed a portable camera
that would fit easily into the palm
of the hand and yet take high
quality, spontaneous pictures.
The Minox subminiature camera,
in its various models, was the
world's most widely used spy
camera. When it first became
available, the camera was con-
sidered a marvel of technology;
it was originally made from steel
in Riga from 1937-1944.

016-MC

017-M-DU-C

018-MC

019-D
DYNAZOOM
The Dynazoom was a state-of-the-art device for stereo viewing of satellite and aircraft film in the 1960s and 1970s. It optically couples two commercial microscopes capable of magnifications up to 300×. Using these tools, analysts could extract maximum intelligence from stereo image pairs—but setup was not easy. Unlike today's highly automated stereo viewing of digital imagery, analysts had to manually and painstakingly align film and adjust the microscopes to view images in stereo on the Dynazoom.

020-EC
ELEPHANT COUNTER
CIA technicians invented and used this unusual device in the 1960s to keep track of the enemy in Southeast Asia. The mission was to count people and supplies moving down the Ho Chi Minh Trail from North Vietnam to South Vietnam along the borders of Laos and Cambodia. Many of the Laotian trail watchers whom CIA recruited could not read or write, let alone understand English. And so the device featured "pictograms," such as symbols representing troops, trucks, motorcycles, carts, bicycles, tanks, cannons, small artillery, missiles, donkeys, and yes, occasionally elephants, a common beast of burden in Laos. Alongside each pictogram was a knob that could be set to a number, and then the data could be transmitted to an airplane by activating a toggle switch.

021-GJA-USEM
GAP JUMPING ANTENNA OUT OF US EMBASSY IN MOSCOW
What looked like a concrete ball was actually a "gap-jumping antenna" removed from one of the preformed concrete columns in the embassy office building. US investigators called it "gap-jumping" because it coupled magnetically with a matching antenna in the adjacent column. This allowed data to be transmitted without a physical electrical connection.

022-DMS
DISTORTION MEASURING SET
Atlantic Research Corporation's distortion measuring set was used to analyze the percentage of distortion on a communications circuit in Bangkok.

019-D

020-EC

021-GJA-USEM

022-DMS

023-DI
DRAGONFLY INSECTOTHOPTER
Developed by CIA's Office of
Research and Development in
the 1970s, this micro Unmanned
Aerial Vehicle (UAV) was the first
flight of an insect-sized aerial
vehicle (Insectothopter). It was
an initiative to explore the con-
cept of intelligence collection
by miniaturized platforms.

024-RF-C
ROBOT FISH "CHARLIE" CIA's
Office of Advanced Technologies
and Programs developed the
Unmanned Underwater Vehicle
(UUV) fish to study aquatic robot
technology. The UUV fish con-
tains a pressure hull, ballast sys-
tem, and communications system
in the body and a propulsion
system in the tail. It is controlled
by a wireless line-of-sight
radio handset.

025-PC
PIGEON CAMERA
CIA's Office of Research and
Development developed a
camera small and light enough
to be carried by a pigeon. It would
be released, and on its return
home the bird would fly over a
target. Being a common species,
its role as an intelligence collec-
tion platform was concealed
in the activities of thousands
of other birds. Pigeon imagery
was taken within hundreds
of feet of the target so it was
much more detailed than other
collection platforms.

023-DI

024-RF-C
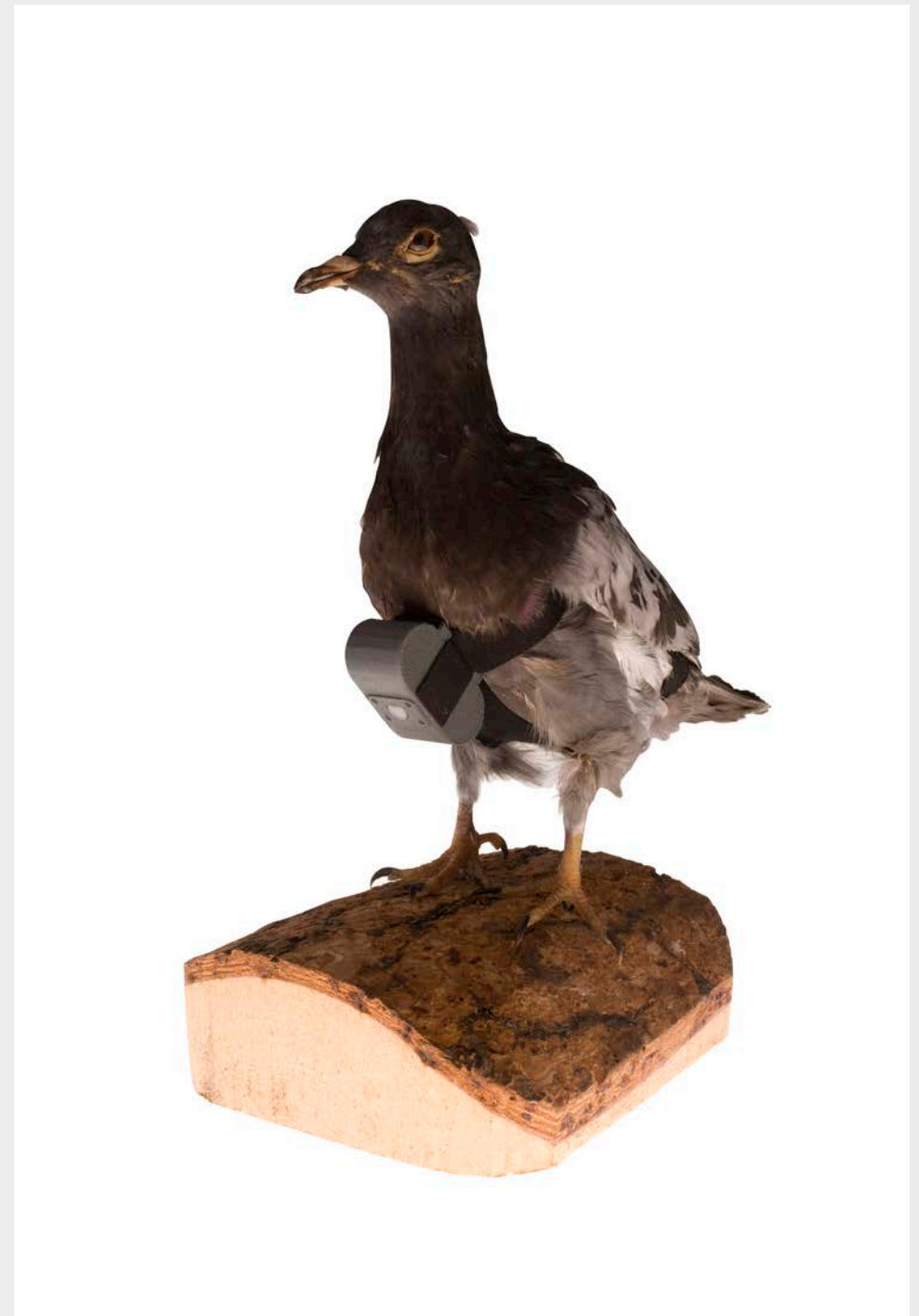
025-PC

026-BB-HCAD
"BELLY BUSTER" HAND-CRANK
AUDIO DRILL
CIA used the "Belly Buster" drill
during the late 1950s and early
1960s. It would drill holes into
masonry for implanting audio
devices. After assembly, the base
of the drill was held firmly against
the stomach while the handle
was cranked manually. This
kit came with several drill bits
and accessories.

026-BB-HCAD

Surveillance by Kyle Fletcher
Surveillance mandalas influenced by the
tension between violence and (super)vision.
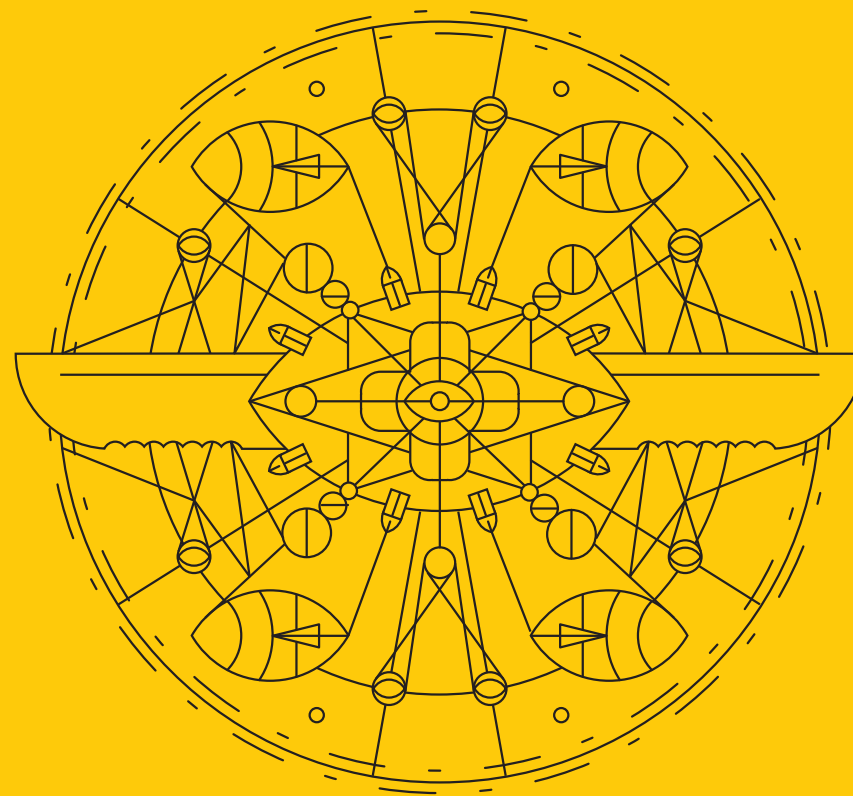
Essay and graphics by Ruben Pater

Drone Survival Guide

Twenty-first Century Birdwatching
Our ancestors could spot natural predators from afar by their silhouettes. Are we equally aware of the predators in the present day? Drones are remote-controlled planes that can be used for anything from surveillance and deadly force, to rescue operations and scientific research. Most drones are used today by military powers for remote-controlled surveillance and attack, and their numbers are growing. The Federal Aviation Administration predicted in 2012 that within 20 years there could be as many as 30.000 drones flying over US soil alone. As robotic birds will become commonplace in the near future, we should be prepared to identify them. This survival guide is an attempt to familiarize ourselves and future generations, with a changing technological environment.

More than 87 nations in the world have drone technology, with over 200 types of drones. This document contains the silhouettes of the most common drone species used today and in the near future. Each indicating nationality and whether they are used for surveillance only or for deadly force. All drones are drawn in scale for size indication. From the smallest consumer drones measuring less than 1 meter, up to the Global Hawk measuring 39.9 meters in length. To keep this document widely available it can be downloaded in .pdf or .doc format. More translations are available on the website.

dronesurvivalguide.org

Hiding From Drones

Drones are equipped with extremely powerful cameras which can detect people and vehicles at an altitude of several kilometers. Most drones are equipped with night vision, and/or infrared vision cameras, so-called FLIR sensors. These can see human heat signatures from far away, day or night. However there are ways to hide from drones.

A1
Day camouflage. Hide in the shadows of buildings or trees. Use thick forests as natural camouflage or use camouflage nets.

A2
Night camouflage. Hide inside buildings or under protection of trees or foliage. Do not use flashlights or vehicle spot lights, even at long distances. Drones can easily spot these during night missions.

A3
Heat camouflage. Emergency blankets (so-called space blankets) made of Mylar can block infrared rays. Wearing a space blanket as a poncho at night will hide your heat signature from infrared detection. In summer when the temperature is between 36°C and 40°C, infrared camera's cannot distinguish between body and its surroundings.

A4
Wait for bad weather. Drones cannot operate in high winds, smoke, rainstorms or heavy weather conditions.

A5
No wireless communication. Using mobile phones or GPS-based communication will compromise your location.

A6
Spreading reflective pieces of glass or mirrored material on a car or on a roof will confuse the drone's camera.

A7
Decoys. Use mannequins or human-sized dolls to mislead the drones' reconnaissance.

Hacking Drones

Drones are remote controlled. The pilots operating the drone can be thousands of kilometers away at ground control stations. The control link is the satellite transmitted datalink by which the pilot controls the plane. By jamming or intercepting the datalink, one can interfere with the drones controls. The data link is sometimes encrypted but not always.

B1
Interception. A complicated technique is to use sky grabber software with a satellite dish and a TV tuner to intercept the drone's frequencies. Communication from and to the drone can be intercepted.

B2
Interference. By broadcasting on different frequencies or pack of frequencies the link between the drone pilot and the drone can be disconnected.

B3
GPS spoofing. Small, portable GPS transmitters can send fake GPS signals and disrupt the drones' navigation systems. This can be used, for example, to steer drones into self-destruction flight paths or even hijack them and land them on a runway.

A1

SkyGrabber
B1

A3

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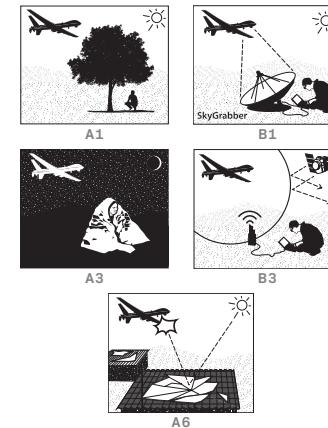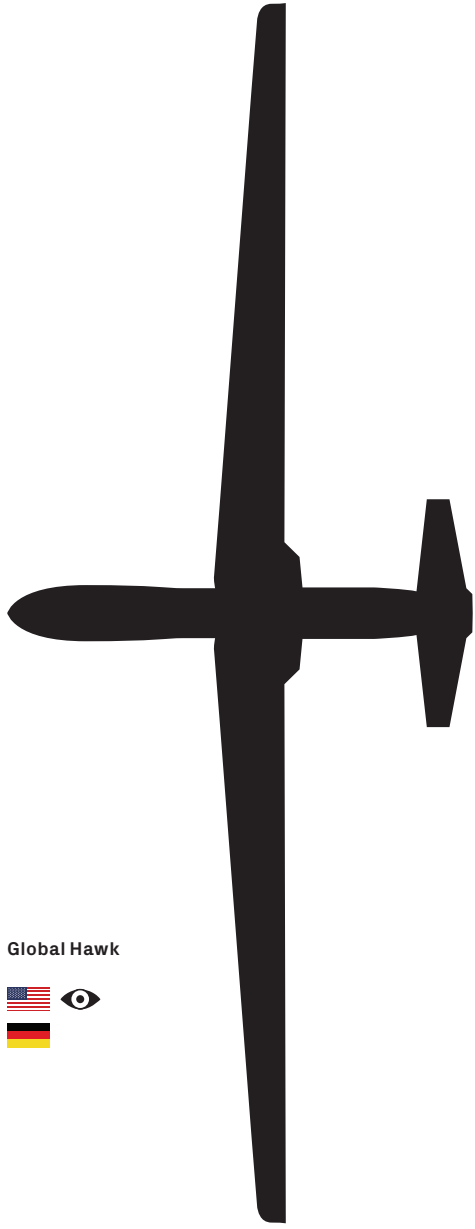
👁
Military
Surveillance

☠
Attack

6ft.
2m

Global Hawk

🇺🇸 👁
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Reaper

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Predator

🇺🇸 👁 ☠
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Herti

🇬🇧 👁

Hermes

🇮🇱 👁
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6ft.
2m

Shadow
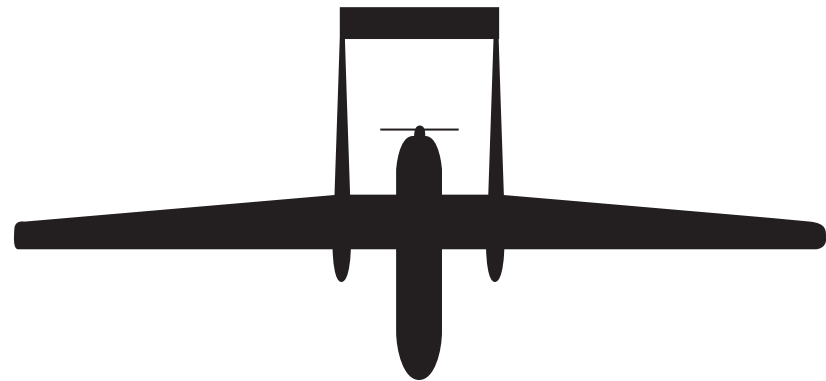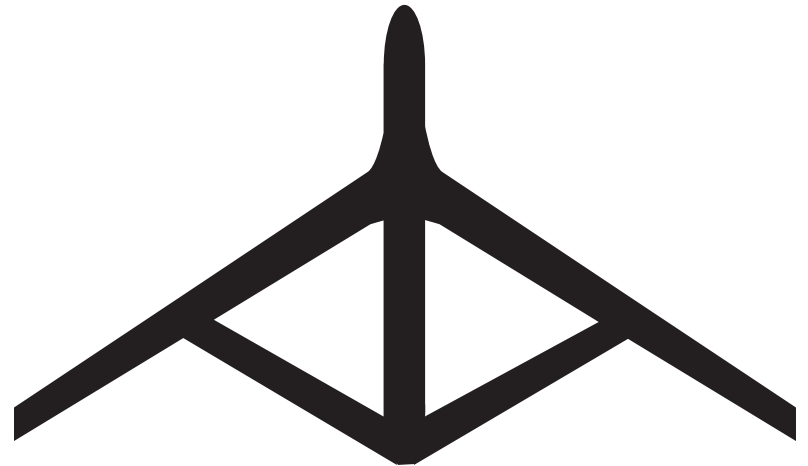
Heron

Eitan

Soaring Dragon

Mantis

Avenger

Barracuda

AR Parrot

WASP III

Aeryon Scout

Air robot
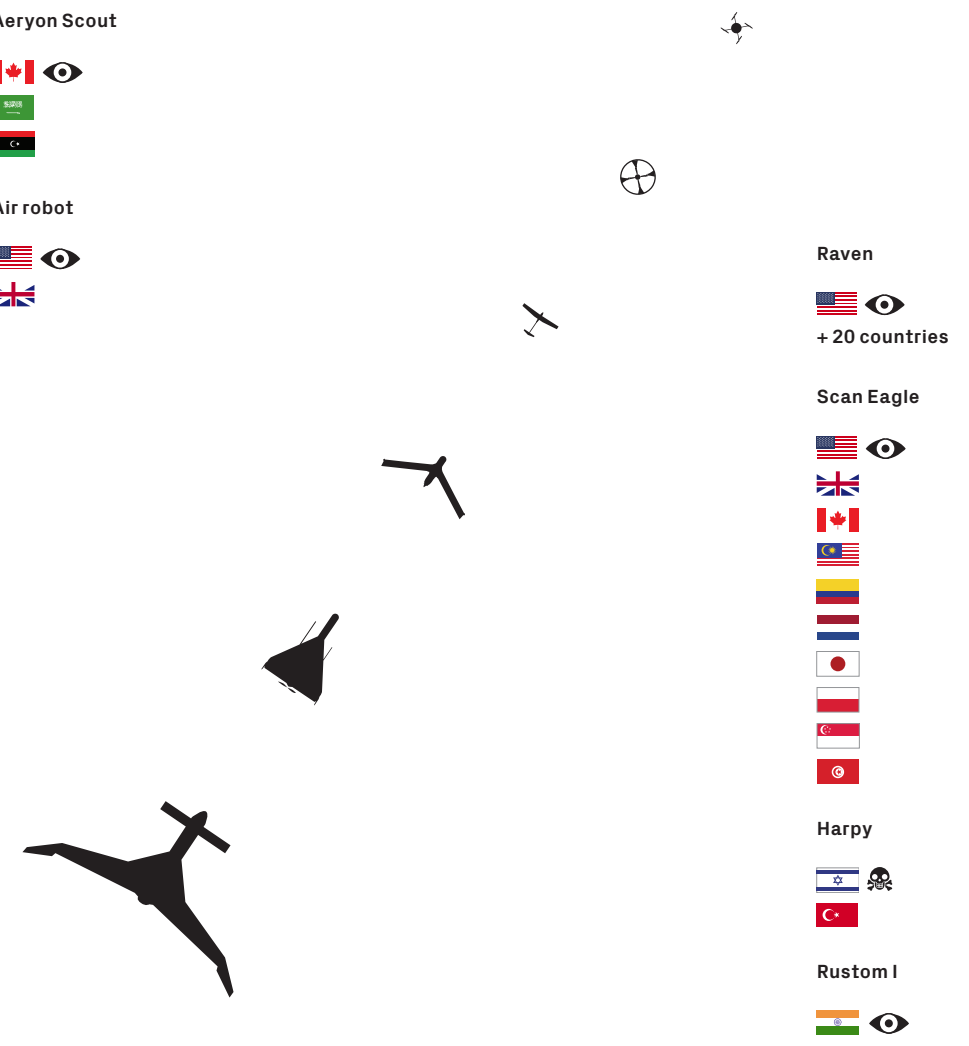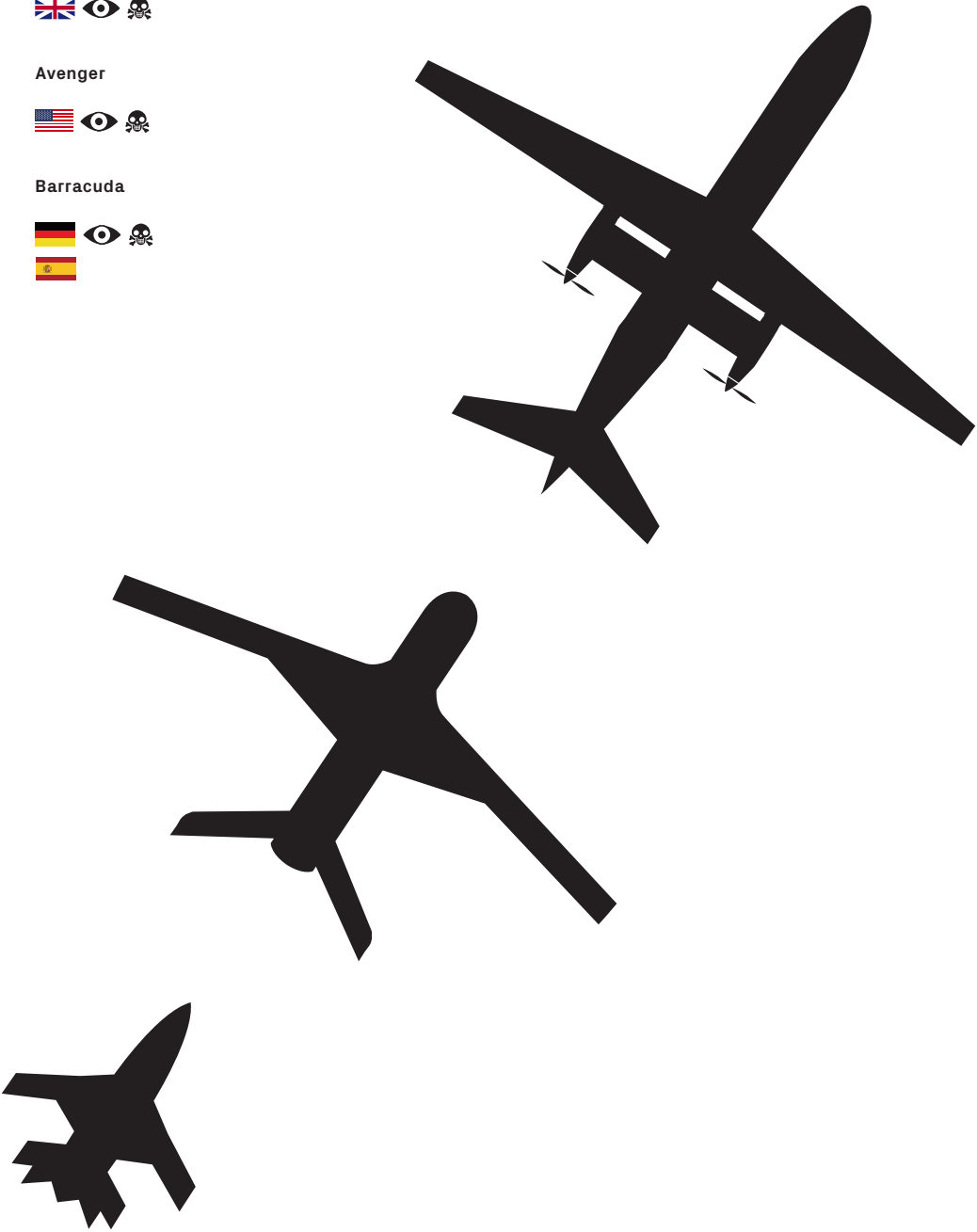
6ft.
2m

Raven

+ 20 countries

Scan Eagle

Harpy

Rustom I

X47C

X45C
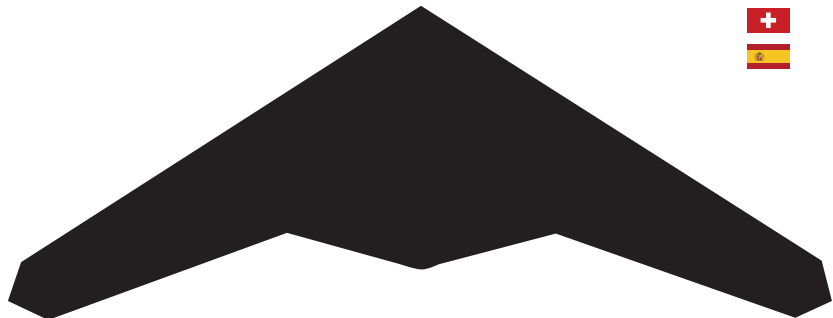
Killer Bee

nEUROn

Sentinel
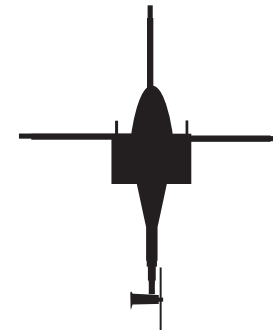
Fire Scout

Hummingbird

6ft.
2m

piip

show

Essay by
Isaac Rooks
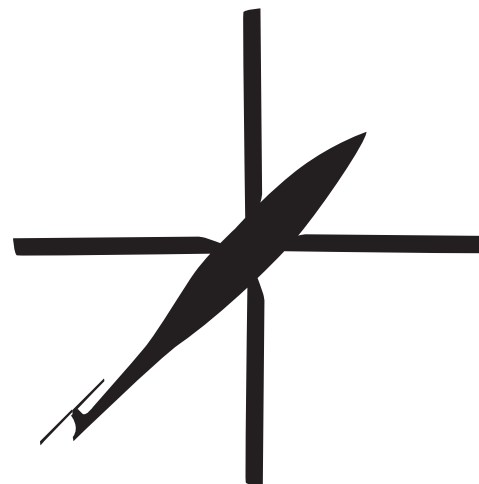
KAFFEDRIKKER

ESPRESSO		24
ESPRESSO	M LITT MELK	34
CAPPUCCINO		36
JAVA LATTE		36
CAFFE LATTE		38
CAFFE MOCHA		42
EKSTRA	ESPRESSO	6
	LAKTOSEFRI MELK	4
	SOYA	8
DAGENS KAFFE		28 34
VALRHONA KAKAO	LITEN	42
	STOR	48

TE

I KOPP	34
CHAI LATTE	42

V60 BRYGG

COSTA RICA DON MAYO	
HONNING	
MYK OG BALANSERT	42
ETIOPIA HACHIRA	
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FRISK OG SAFTIG	
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It's a hip yet unremarkable looking coffee shop. Oslo residents might recognize it as the Java Espressobar, designed by architect turned World Barista Champion Robert Thoreson.[1] There's a counter with four stools in front, and behind it are various café accouterments. Black menus on the mottled green walls list the various items for sale, but the feathered patrons already know what they want: seeds. This is *Piip-Show*, a live streaming Norwegian bird watching program run through state broadcaster NRK.

There are two streams to choose from. One is the aforementioned coffee bar. A camera is trained on a miniature set that blocks out the natural scene within which it is located. Birds fly in from the surrounding environs, but to a viewer it appears as if they have entered an urban café. The other stream shows a nest designed to look like a suburban house. Again, no element of the surrounding natural world is visible.

For a three-month run, until June 2014, viewers can watch these birds 24/7. As the official site promises: "These Tits…Are Suitable For Work."[2] Ornithological double entendres notwithstanding, *Piip-Show* viewers might not see tits or any other birds. The nest is a fairly safe bet, but café watchers could be in for a long wait. The streaming clock, a small screen of rotating images and text next to the bar, and faint background noise might be the only indication the connection works. The seeds offer an incentive, but the birds have their own lives. It does not help that differing time zones mean US and Norwegian bird-watching schedules do not synch up. Still, an expectation of patience is built into *Piip-Show's* genre.

Piip-Show originally aired as an Internet feature in 2003, created by its current mastermind Magne Klann. In an interview with *The Guardian*, Klann explains that the idea came "before all this minute-for-minute programming, which they call Slow TV … I don't want to take credit for all the other projects, but in a way we were the first."[3] That fact could be easily forgotten, as *Piip-Show* returns under the auspices of Slow TV, the unusual program format for which Norway is internationally notorious.

Slow TV began in 2009 with *Bergensbanen: Minutt for Minutt* [Bergen Line: Minute for Minute]. This seven hour and sixteen minute train POV provided viewers with an "orgy of beautiful nature," and broad-

casters with absurdly high ratings (1.2 million viewers out of a national population of around 5 million).[4] Slow TV became a national phenomenon. Subsequently, other similar events have aired. The longest was a live five-day broadcast of a boat sailing north through the Norwegian fjords (*Hurtigruten: Minutt for Minutt*). These programs' incredible success resulted in the format being bought by the American production company LMNO, which hopes to translate it to American television.

In *Hurtigruten: Minutt for Minutt,* viewers see all stages of coastal development along the ship's course, with the omnipresent prow a constant reminder of the technology involved. © NRK

It's logical to question whether such a leap will be possible. Norway is a unique country, and its people often cite N orwegian exceptionalism to foreign journalists trying to explain how and why something like Slow TV can be so popular. Sociologist Arve Hjelseth describes it as a "celebration of the Norwegian way of doing things, which we believe to be slightly different."[5] Yet it speaks to something larger than Norwegian idiosyncrasy. Commentators describe it as a form of anti-television, an "antidote" to the popularly demonized medium.[6] That sentiment can extend to envisioning Slow TV as an oasis from hectic and homogenized modernity. Lori Rothschild Ansaldi, LMNO's senior VP of development, explains the format's appeal: "In a world where everything moves so fast, it was refreshing to find something so captivating that you did not want to look away from it."[7]

Slow TV's programs can be roughly divided into two categories. There are programs documenting culturally significant processes, such as sweater knitting and wood burning. Then there are shows documenting natural landscapes, such as the train and boat broadcasts referenced above. These are landscapes that are beautiful, but also mundane. Viewers do not simply get the amazing vistas; they also get views of the suburban and urban

Bergensbanen: Minutt for Minutt **details the famously beautiful Bergen to Oslo route. Viewers see lovely countryside and developed areas from the point of view of the train moving swiftly along the tracks.** © NRK

environments scattered along the route. Through watching in real-time, one gets a sense how all these elements are linked and located in relation to each other. Nature is never fully remote. Even when audiences get the classic nature scenes, they are doubly technologically mediated. Not only is the train cutting through that landscape, it is also being filmed and broadcast. *Piip-Show* represents Slow TV's foray into wildlife programming. -

John Berger's "Why Look at Animals?" suggests that capitalist modernity and industrialization resulted in the "historic loss" of the age-old connection between humans and animals.[8] Animals have been physically, but not mentally or culturally, displaced. People still *need* to connect to animals. Berger describes public zoos as an attempt to combat urban alienation from nature and wildlife. However, in his mind those encounters with denaturalized (uprooted and transplanted) animals

are bound to disappoint, as there can be no reciprocal gaze, and therefore no real connection. In modern conditions, "animals are always the observed. The fact that they can observe us has lost all significance." [9]

That unequal gaze characterizes many popular wildlife and nature documentaries. Public zoos curate nature for visitors, gathering into one space an international menagerie of exotic and charismatic animals to consume visually. Traditional documentaries provide a similar function. They showcase nature with the boring bits edited out. They favor spectacular imagery, as was the case with BBC's *Planet Earth* (2006), a series that used HD technology to present "*Planet Earth* as you've never seen it." They also favor drama and action. The Air Jaws trend amply illustrates this development. Great white sharks simply do not cut it anymore. Programs need to show massive sharks launching themselves into the air to truly impress. It's those astonishing animals that people want to see. When these shows do not rely on a human adventurer to guide the narrative, they often visually efface the presence of humans just behind the camera. It creates the illusion that viewers are getting a rare look at a pristine natural world.

Much as Slow TV differs from popular television, *Piip-Show* offers a stark contrast to those documentary trends. It is a nature program largely without curation. *Piip-Show* and its fans might capture screen shots or video footage to circulate, but viewers watching with the actual stream could face long stretches of inaction, punctuated by surprise encounters. It's a very different mode of engagement from the immediate gratification provided by most wildlife programs. Scholars writing on nature webcams argue this type of spectatorship offers a more authentic sense of and intimate connection with the natural world.[10] One gets a feel for nature's slow rhythms and the quality of animal life. However, most of those scholars consider objects that include the natural landscape. In addition to offering minimal action, *Piip-Show* also features very little actual nature as its built set obscures the larger scene.

Seeing birds and squirrels interact with a set recreating an urban human environment brings to mind Victorian grotesques. These are anthropomorphic taxidermy displays, where animals are posed in humanoid

Cozy home © Magne Klann
and Lars Aurtande / NRK

scenes and postures. Rachel Polinquin discusses this practice, noting it does not offer commentary on either the animals or humans.[11] Nothing can be learned from such scenes. They simply highlight human mastery, as disposable animals "become playthings to be looked at by a disconnected, detached observer."[12] Of course, *Piip-Show's* patrons are vibrant and do not carry the same unsettling pall of death. Still, could something similar to Polinquin's statement apply to *Piip-Show's* unseen global audience, sitting at their computers and watching unsuspecting animals lured into this scene for their amusement? I argue not, as the mastery so inherent to grotesques, and conventional wildlife programs, is fundamentally undercut by *Piip-Show's* format.

The reason *Piip-Show* evokes such examples is because it plays with their conventions. It's not just the setting of the show that encourages audiences to view the birds through an anthropomorphic lens. It indulges and encourages reality show style rhetoric when discussing the program. The official site lays out the scene: "Different personalities meet inside the bar. Among others a short tempered nuthatch, a blue tit with the memory of a gold fish, a happy-go-lucky great tit, and a depressed bullfinch [sic] … Like in any other bar there is bickering, petty theft, fighting and attempts at romance."[13] This plays up the difference between Slow TV's version of reality TV and the genre's maligned popular expression. It also tweaks the tendency of people and documentaries to anthropomorphize animal subjects.

The setting's artificiality does not just indirectly comment on other media. It also performs the Slow TV trick of highlighting mediation. Conventional nature webcams frustrate the desire to gaze at animals by not making them constantly available. However, even if the animals are not present, one can see the landscape in which they live. There is always something natural the visitor gets to experience vicariously. The placement of the camera in an otherwise pristine environment also feeds into the impression of successful and covert surveillance. *Piip-Show's* format does not allow the same kind of scopophilic thrill.

Birds hang out at this bird feeder modeled after a hip Oslo cafe.
© Magne Klann and Lars Aurtande / NRK

Illustrator and model maker Lars Aurtande by the bird feeder
© Magne Klann and Lars Aurtande / NRK

There's a direct acknowledgment of the artificial and constructed setup, where food has been left out to lure birds in front of the camera. The gaze this staged encounter allows is also limited. It restricts viewers' ability to survey the natural surroundings. Importantly, one can still hear the sounds of that hidden scene. Sometimes there's tantalizing birdsong in the background, even when no birds are present. Sometimes snow or rain falls in front of the camera. All these things frustratingly point to a larger world that audiences are denied. Its setup blatantly thwarts the desire for a mediated "authentic" landscape. *Piip-Show's* novelty and humor can draw in audiences. It offers a level of satisfaction for viewers looking for a meditative experience, punctuated by surprise encounters with the natural world. Yet it offers no false promises. Surveillance of the natural world can only provide so much. It's the teaser. If you want the real thing, you'll have to leave your computer.

1   Liz Clayton, "At Java in Oslo, Specialty Coffee is For the Birds," *Sprudge: Coffee News & Culture*, last modified March 19, 2014, sprudge.com/java-in-oslo-specialty-coffee-is-for-the-birds.html.

2   "About the Piip-Show*," NRK*, last modified April 3, 2014, nrk.no/piipshow/about-the-piip-show-1.11575642.

3   Richard Orange, "Feathers Fly in Norwegian Wild Bird Reality-TV Show," *Guardian*, last modified March 18, 2014, theguardian.com/world/2014/mar/18/norway-launches-wild-bird-reality-tv-show.

4   Akira Okrent, "4 Shows from Norway's Crazy, Successful Slow TV Experiment," *The Week*, last modified June 7, 2013, theweek.com/article/index/245300/4-shows-from-norways-crazy-successful-slow-tv-experiment.

5   Ellen Emmerentze Jervell, "Norway's Hit Reality TV: 18 Hours of Swimming Salmon," *Wall Street Journal*, last modified June 16, 2013, online.wsj.com/news/articles/SB100014241278873249040045785391102286345592.

6   Stuart Heritage, "Slow TV: the Norwegian Movement with Universal Appeal," *Guardian*, last modified October 4, 2014, theguardian.com/tv-and-radio/tvandradioblog/2013/oct/04/slow-tv-norwegian-movement-nrk.

7   Kevin Ritchie, "LMNO to Remake Norway's Slow TV in the U.S," *Realscreen*, last modified November 5, 2013, realscreen.com/2013/11/05/lmno-to-remake-norways-slow-tv-in-the-u-s/.

8   John Berger, "Why Look at Animals?" in *About Looking* (New York: Vintage Books, 1980), 28.

9   Ibid., 16.

10 Ike Kamphof, "Linking Animal and Human Places: The Potential of Webcams for Species Companionship," *Animal Studies Journal 2, no.1* (2013).

11 Rachel Polinquin, "Allegory," in *The Breathless Zoo: Taxidermy and the Cultures of Longing* (University Park, PA: Pennsylvania State UP, 2012), 184.

12 Ibid., 181.

13 "About the Piip-Show."

Every Breath You Take

In the style of

The Police

Album: Synchroncity
Writer: Sting
Producer: The Police, Hugh Padgham
Released: May 20, 1983

Time: 4:13

Every breath you take
And every move you make
Every bond you break, every step you take
I'll be watching you

Every single day
And every word you say
Every game you play, every night you stay
I'll be watching you

Oh can't you see
You belong to me
How my poor heart aches
With every step you take

Every move you make
And every vow you break
Every smile you fake, every claim
I'll be watching you

Since you've gone I been lost without a trace
I dream at night I can only see your face
I look around but it's you I can't replace
I feel so cold and I long for your embrace

I keep crying baby, baby, please

Oh can't you use
You belong to me
How my poor heart aches
With every step you take

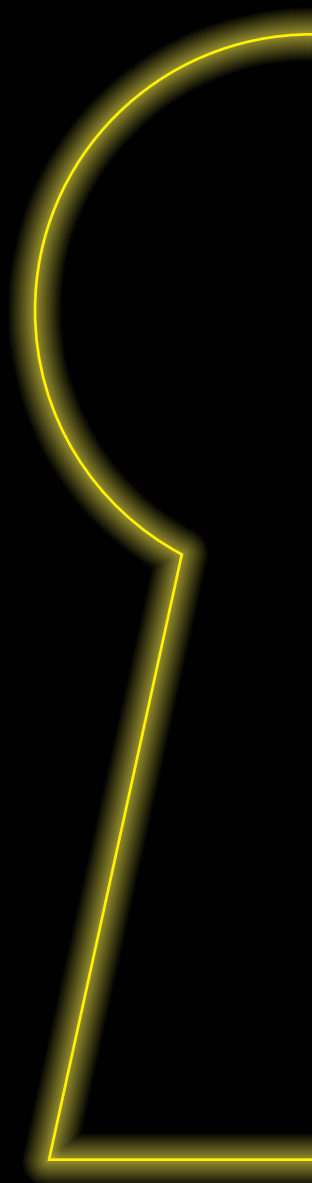Every move you make
And every vow you break

Somebody's Watching Me

In the style of

Rockwell

Album: Somebody's Watching Me
Writer: Kennedy "Rockwell" Gordy
Producer: Curtis Anthony Nolen
Released: January 14, 1984

Time: 3:33

Who's watching?
Tell me who's watching
Who's watching me?

I'm just an average man, with an average life
   I work from nine to five; hey hell, I pay the price
      All I want is to be left alone in my average home
         But why do I always feel like I'm in the Twilight Zone,
         and

            I always feel like somebody's watching me
            And I have no privacy
            Woh, I always feel like somebody's watching me
            Tell me is it just a dream?

         When I come home at night
         I bolt the door real tight
      People call me on the phone I'm trying to avoid
   Well, can the people on TV see me
   Or am I just paranoid?

      When I'm in the shower
       I'm afraid to wash my hair
        'Cause I might open my eyes
         And find someone standing there
         People say I'm crazy
          Just a little touched
           But maybe showers remind me of "Psycho" too much
            That's why

            I always feel like somebody's watching me
            And I have no privacy
            Woh, I always feel like somebody's watching me
            Who's playing tricks on me?

            Who's watching me?
             I don't know anymore
              Are the neighbors watching?
               Who's watching?
                Well, it's the mailman watching me, and I don't

Digital Witness

In the style of

St. Vincent

Album: St. Vincent
Writer: Anne Erin Clark
Producer: John Congleton
Released: January 6, 2014

Time: 3:21

Get back, to your seat
Get back, gnashing teeth
Ohh, I want all of your mind

People turn the TV on, it looks just like a window, yeah
People turn the TV on, it looks just like a window, yeah

Digital witnesses, what's the point of even sleeping?
If I can't show it, if you can't see me
What's the point of doing anything?
This is no time for confessing

I want all of your mind

People turn the TV on, it looks just like a window, yeah
People turn the TV on, it looks just like a window, yeah

Digital witnesses, what's the point of even sleeping?
If I can't show it, if you can't see me
Watch me jump right off the London Bridge
This is no time for confessing

People turn the TV on and throw it out the window, yeah
Get back to your stare
I care, but I don't care
Oh oh, I, I want all of your mind
Give me all of your mind
I want all of your mind
Give me all of it

Digital witnesses, what's the point of even sleeping?
If I can't show it, if you can't see m

What Does Big Brother See, While He is Watching?
A Look at the Secret Stasi Archives

Iker Gil interviews Simon Menner

Stasi Spy
Photographs Himself

When an agent photo-
graphed himself at work,
he had probably attained
the highest stage of his
espionage training.

Over a period of two years, photographer
Simon Menner researched the archives of
the German Democratic Republic's Ministry
for State Security (Stasi), one of the most
effective and feared surveillance organiza-
tions that ever existed. The quantity and
breadth of the images he was able to unearth
in that period provided invaluable visual
evidence of surveillance from the organiza-
tion. These images documented multiple ar-
eas of the Stasi, from seminars on disguises
and how to apply fake facial hair, to secret
house searches and spies photographing
other spies. This material was compiled
in his book Top Secret: Images from the
Stasi Archives (Hatje Cantz, 2013).
    We talked to Simon to know more about his
project, the current state of surveillance,
and the need to look further into the past
to see what is possible.

How did you come across this project and
what was the process of searching for and
selecting the photos?

As an artist I am very much interested
in the way images work and the way they are
utilized to influence behavior and percep-
tion of other people. That, of course, has
a lot to do with the topic of surveillance.
So, while I found that people have written
about these things and that I could access
a ton of material, there is actually very
little photographic material to be seen.
I like to phrase it this way: "If it is true
that Big Brother is watching us, what does
he actually see?"
    Due to the nature of this material we take
it all too much for granted that it is not
accessible. But if we dig somewhat deeper,
we might be able to find something. To be
honest, working with the Stasi files was
relatively easy, but other material might be
just as accessible without us realizing it.

Secret House Searches

The Ministry for State Security often carried out secret house searches. Not only were inhabitants not informed about the searches—many first found out about these state-prescribed break-ins after German reunification—they were deliberately left in the dark. Stasi agents used Polaroid cameras in order to carry out their search without leaving any traces. Before beginning their search they took Polaroid pictures of suspicious parts of the house, enabling them to return everything to its original place afterwards. The picture of an unmade bed is thus the picture of an unmade bed before it was searched.

The Polaroid film material was bought in the West through covert channels and was often also confiscated along with various other types of film during the routine opening of private mail from the West.

What is the goal of making these images public in book format and through exhibitions?

The book is the type of photographic material I was looking for before diving into this project. But speaking more broadly, it is important to make this material accessible as a basis for a discussion on the nature of surveillance. It would be wonderful to have this discussion on the basis of more contemporary material, but this is not possible. So we have to look further into the past, to see what is possible. Nowadays many of these images might look funny or absurd, but that is partly due to the age of the material. Thirty years ago, the Stasi was at the height of its power and right at the center of surveillance worldwide. I guess if you could access thirty-year-old CIA material it wouldn't be that different from what you see here.

One the fascinating aspects of your project is that it provides an insider perspective and visual evidence of surveillance from the organization spying.

Something you would not believe that it looks the way it actually does. Yes, that is truly fascinating. Quite a few people believe that all this shown here is fake and staged—it is not. In fact, I don't think that I would have ever been creative enough to come up with the amount of absurdity some of these images show. Maybe this could serve as a proof of authenticity. Some of these images are strange and beyond faking.

While some of the images might look innocent and even mundane, the way that the Stasi interpreted them could have very serious consequences for the people under surveillance.

This is very important, even though many of these images make you smile and shake your head. Please do not forget that they were never meant to be seen by the public. They are real, and the things taught through these pictures were used in real life to suppress a whole society.

Also, many of the things documented apparently show nothing of importance. However, a picture of a West German coffee maker could be interpreted as something very harmless or as something that might send you to jail. Big Brother has some strange powers, and one of them is to look at information gathered and read it the way he wants. People really suffered for some of these harmless photographs.

Are there any images that you find especially significant in terms of surveillance?

Personally, I am deeply moved by the huge number of Polaroid images that were taken during secret house searches. People were not aware that the Stasi quite frequently broke into apartments of people they considered a threat. In fact, the Stasi agents were so good in hiding the fact that they searched everything that most people only found out about it after the fall of the Berlin Wall. To me, they reveal the true terror that hides inside these systems.

Revealing in another totally different way, are images I did find that show agents from western allied military organizations— the so-called "Military Liaison Missions." These spies were in theory free to move inside East Germany. These pictures show the moment when a Stasi agent and a western agent encounter each other and both take a picture. This tells me that, even though these people appeared to operate on two opposing sides of a conflict, they did share a similar state of mind. It is also quite revealing that the images taken by western agents are still not accessible.

It is interesting that the Stasi archive is public and the archives from West Germany, UK, or US are not.

The archive the Stasi unwillingly left behind is a true treasure. We have to keep in mind that, if the Stasi had its say, none of the material shown in the book and stored in the files would have survived. It is somewhat ironic that the West claims freedom and transparency to be key factors in the structure of society. History opened up the files of one of the most autocratic and opaque systems while those in the West remain hidden—or in huge parts have been destroyed.

It is not that I did not try to get access to similar material from West German archives—oh hell I did. But there is no way of getting access. One source familiar with the BND (Bundesnachrichtendienst) archives told me: "Of course similar things exist, but keep in mind that the person putting on disguises as a training might now be the head of a whole department. Of course these pictures never get out."

Spies Photograph Spies

Small military liaison missions existed among the Allied forces stationed in Germany that could, theoretically, move about freely in the country. The Western Allies based their missions in East Germany while the Soviet Union stationed theirs in West Germany. Both sides saw this as a good means of gathering intelligence. While the respective German intelligence services could not legally hinder such activities, they did attempt to disrupt or at least document them as best they could. One of the Stasi's main concerns was the surveillance of the Western military liaison missions. The agents on both sides were very much aware of the presence of the other side, and these photographs exist despite the agents' knowledge that they were being observed by the other side. A very similar approach was taken on both sides of the Iron Curtain. I attempted to attain equivalent pictures from British military archives, but I was unsuccessful. Although such images apparently exist, they are still inaccessible years after the end of the Cold War.

What are your thoughts on current surveillance?

The situation is terrible. It makes me sick when I look at the cooperation between European countries and the US that goes against all democratic principles. What makes it absurd is the situation in Germany, where both current chancellor Angel Merkel and president Joachim Gauck grew up in East Germany and both have accumulated huge Stasi files of their own. Even worse, Gauck played a key role in opening the Stasi files to the public. We are at the point at which several powerful people should face court to resolve this. But this is not going to happen. Instead, whistleblowers disappear in jail. People like Chelsea Manning and Edward Snowden deserve our fullest support and sympathy and should be treated like heroes.

Some of your other projects have also touched on camouflage and disguise. How does this project relate to your previous trajectory and what is ahead?

Images and how they are used fascinates me. Most of my work is closely related, even though I am not completely sure if this is clear to others.

    Currently I am trying to work with an archive in the UK—which unfortunately has proven to be extremely difficult. Please wish me luck. Not to go into the details, but it would be about the relationship between tourism and war and how the touristic gaze guides the focus of warfare. Again, related to the Stasi project, but I am not going to reveal the details.

Best of luck! Looking forward to seeing the result of that project.
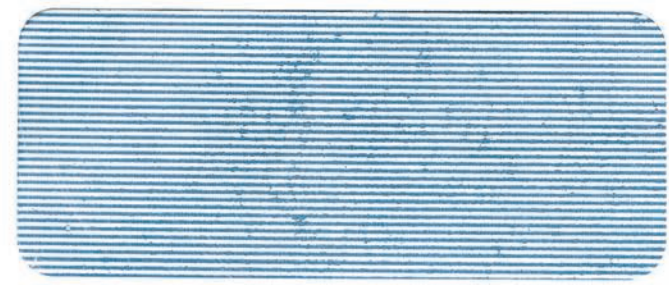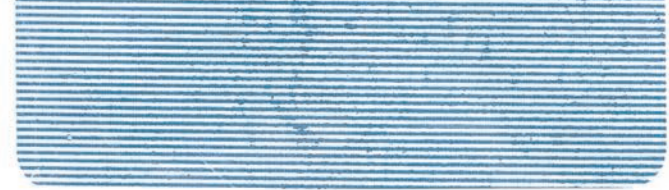

From a Seminar on Disguises

The pictures shown here were taken during a seminar in which Stasi personnel were taught how to don different disguises. The goal of the seminar was to enable Stasi agents to move about in society as inconspicuously as possible.
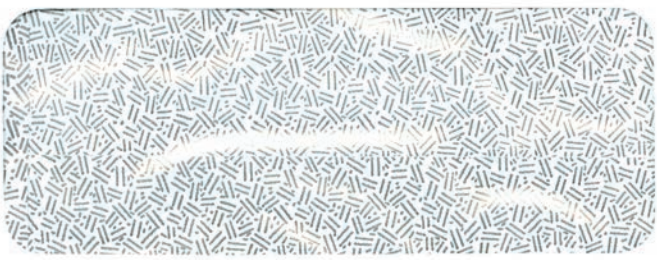
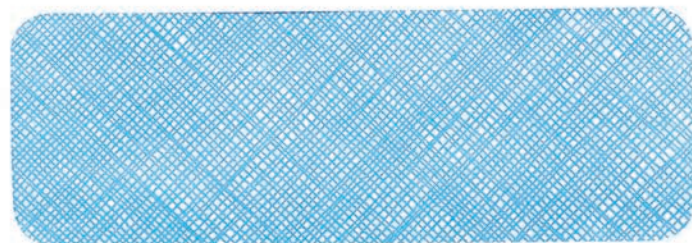Surveillance by Jason Pickleman

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So now we're even, right?

Abbott H. Thayer's Vanishing Ducks: Surveillance, Art, and Camouflage

ESSAY BY
ROY R. BEHRENS

DROP SHADOW

Surveillance and camouflage are intrinsically intertwined—they evolve in lockstep. Whenever surveillance advances, deception must adapt in kind. Likewise, when challenged by new kinds of camouflage, surveillance must be redefined to see beyond or through those ploys.

Put simply, surveillance is a "seeing eye." Whenever detection is thwarted—as is an all-important goal of camoufleurs—it succeeds by eluding the powers of a watchful entity, whose visual apparatus may differ greatly from human surveillance, with or without technological aids. The eyesight of a hunter, for example, differs from that of a white-tailed deer. Safety orange hunting outfits, while blatantly apparent to humans, are imperceptible to deer. At the same time, both deer and people are readily fooled by background matching and simulations of foliage.

COUNTERSHADING

How have we become attuned to this sensory *pas de deux* between surveillance and deception? Despite the current online myth that Pablo Picasso invented modern camouflage, it is far more likely that its originator was an academically trained, turn-of-the-century painter named Abbott Handerson Thayer. His initial groundbreaking discovery (first announced in 1896) is known as countershading or, less commonly, "Thayer's law."[1]

Simply, whenever we encounter things, we default (because of how our brains are built) to the assumption that illumination comes from above, with diminished lighting (or "shading") below.[2] All of us resort to this daily, as when we use computers to make so-called "drop shadows" (fig. 1). Going further, Thayer realized that, in natural camouflage, a wide range of animals benefit from an inverse coloration scheme (an inverted drop shadow), by which they have evolved to be light-colored on their stomachs (he called it "the meaning of the white undersides of animals") and progressively darker toward the top.

In countershading, the shading produced by the overhead sun is counteracted or cancelled out by this inverse coloration, as a result of which an animal looks less solid, less substantial—less "thing-like." When this is combined with a "freezing" response (remaining strictly motionless, since movement is the great spoiler of camouflage), the animal has an increased chance of remaining undetected (fig. 2).
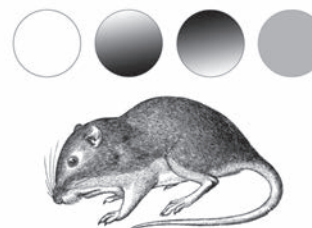
Among artists, the shadow effect is synonymous with shading, a technique that Thayer was masterful at. Indeed, he was so skilled that not only could he make flat surfaces appear three-dimensional, he could make objects disappear—eggs, small carved wooden duck decoys, even raw sweet potatoes—merely through countershading.

Thayer's ability to "paint out" solid objects is amply verified by contemporaneous eyewitness accounts, such as a report that was published in the *Boston Evening Transcript* in 1897.[3] At an earlier conference in Cambridge MA, Thayer had demonstrated countershading to a group of ornithologists, and one of the attendees wrote: "He placed three objects of about the size and shape of sweet potatoes, horizontally on wires a few inches above the ground. They were covered with a sticky material, and then dry earth from the road where they stood was sprinkled over them to make them the same color as their background." The undersides of the two end objects were painted white, and the paint was then carefully mixed with the earth to create a gradual blended effect.

Another eyewitness (present at the same demonstration) recalled: "When viewed from a little distance, these two end ones, which were white below, disappeared from sight, while the middle one [which lacked countershading] stood out in strong relief." Some of those in the audience

could hardly believe that the striking difference in the visibility of the three potatoes was entirely due to the coloring of the underside, and Mr. Thayer was asked to color the middle one like the two

others, in order that the effect might be observed. Mr. Thayer complied…[and] the effect was almost magical. The middle potato at once disappeared from view.

A few photographs of Thayer's countershading demonstrations have survived. Reproduced here are two (fig. 3) from a famous (albeit controversial) book, painstakingly written and illustrated by Thayer and his son Gerald Handerson Thayer (the book's author of record). Titled *Concealing Coloration in the Animal Kingdom: An Exposition of the Laws of Disguise Through Color and Pattern: Being a Summary of Abbott H. Thayer's Discoveries*, it was first published in 1909, followed by a second edition in 1918.[4]

The captions for these photographs claim that both are images of two wire-mounted "bird-models," side by side, one of which has been countershaded (or, to use the phrase the Thayers preferred, "obliteratively shaded"), the other one not. Both photographs were made "out of doors against bare ground." The Thayers assert that the countershaded model in the top photograph is "faintly visible" on the right, but that in the bottom photograph they have outdone themselves, such that the counter-shaded model is invisible because it "is still better 'obliterated.'"[5] In the first photograph, if a model is visible on the right, it is faintly so at best. A year earlier, they had published another photograph (fig. 4), in which the second wire stand is slightly more evident, but the duck remains elusive.

Some people have openly questioned the presence of the countershaded ducks in these photographs, a response the Thayers could well understand. "The reader will have to take it on faith," they caution, "that this is a genuine photograph, and that there is a right-hand model of the same size at the other."

The likelihood that the models were actually present is supported by another set of photographs (fig. 5) that appeared in *Bird Lore*, a journal of the National Audubon Society, in 1921 (the year that Abbott Thayer died).[6] These photographs replicate the same countershading demonstration, but the set-up is not by the Thayers but by naturalist and bird artist Louis Agassiz Fuertes, who was a friend and student of Thayer, as well as a highly skilled painter.

Fuertes' photographs are more helpful than the Thayers' because he provides an additional step. In the largest of the three images (at the bottom), we see a set-up comparable to the earlier ones. There is a model on the left that lacks countershading and is highly visible; while on the right (we are told in a caption) there is a second model that has been countershaded and, as in the Thayers' examples, is all but invisible.

Fig. 4
This photograph of a countershading demonstration was published in an article by Gerald Thayer in 1908. While it's a great challenge to see the countershaded duck (supposedly on the right), it is possible to see the faint indications of the wire stand. It is unfortunate that they felt the need to hide the wire as well as the duck, since it leaves the viewer with nothing to see. Matthew Brower offers a thoughtful discussion of this in Chapter 4 of his *Developing Animals: Wildlife and Early American Photography.* (Minneapolis: University of Minnesota Press, 2011). He finds Thayer's use of photography to be largely ineffective, in part because it's being used to photograph invisibility, whereas the camera is far better suited to dealing with things that are visible.

Fig. 5
This reconstruction of a Thayer countershading demonstration, made by bird artist (and Thayer student) Louis Agassiz Fuertes, was published in *Bird Lore* in 1921, the year of Abbott Thayer's death.
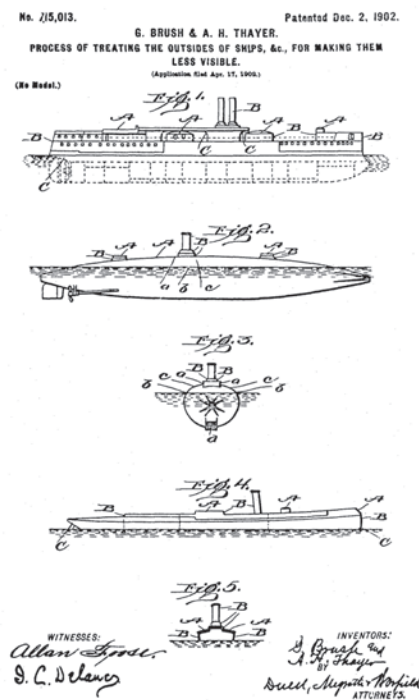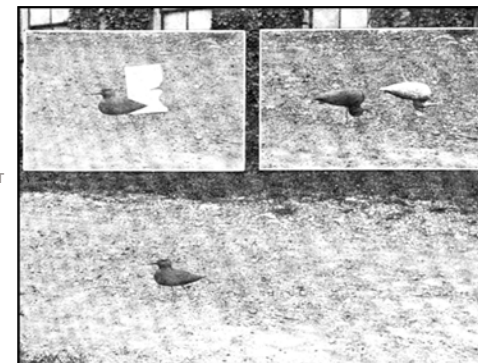

Fig. 6
These are the patent drawings for Abbott Thayer and Gerome Brush's patent (dated December 2, 1902), in which it was proposed that ships could be made less visible through counter-shading.

But there are two other photographs as well: The small one at the top right shows the very same models (one countershaded, the other not), but because they are inverted and lit from above, both are clearly visible. The remaining photograph (at the top left) is the most revealing of the three. It is the very same set-up as in the large photograph (the same two models side by side, correctly positioned), but this time Fuertes has graciously placed a white card in the background, behind and between the two models, as a result of which we can see a portion of the profile of the camouflaged duck.

Thayer applied countershading to other objects as well. For example, he once countershaded a small cast of the Venus de Milo, which he installed in a display case in the town hall at Dublin, New Hampshire. He precisely lit the statue with alternating light sources (above and below), so that "it was the delight of the school children to press the buttons and [by that] make her come and go."[7]

In 1902, in collaboration with Gerome Brush, he was granted a US patent for the use of countershading to make a ship less visible (fig. 6). As described by Brush's sister, this system was analogous to "the general coloring of a seagull, worked in two shades of gray and pure white, the under part of everything being painted white. The side surfaces were gray, the upper surfaces a slate color."[8]

He also experimented with the use of counter-shading in theatrical productions. A recent discovery is a pair of Thayer photographs that show a model in a skin-tight body suit, standing inside a large specially lighted box (fig. 7).[9] The model has been countershaded, just as Thayer had attempted

before with the Venus de Milo. In one photograph, the source of light is from below, and the figure is clearly visible. In the second, the light is coming from above, with the result that the figure can only be seen very faintly (yet, unlike the ducks, it can indeed be distinguished).

In 1914 in the *American Journal of Psychology*, the eminent psychologist Edward B. Titchener praised a countershading installation (a photograph of which survives) that Thayer had donated to Harvard (fig. 8). It consisted of a stuffed tiger in a case that was expertly lighted. When illuminated unnaturally from below, it was clearly visible, but when lit from above like the overhead sun "the animal has lost its solidity, has become amazingly transparent, and merges as a color-pattern into the background."[10]
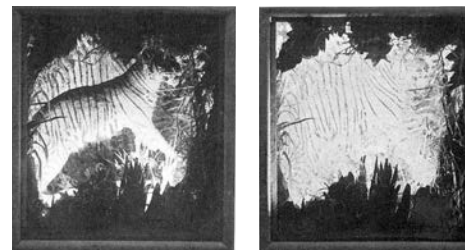

Fig. 8
This shows a pair of photographs (first published in 1914) of the same hallway case at Harvard, photographed from the same position, but with two different light sources.

Fig. 7
These two photographs have recently been discovered in a cache of Thayer artifacts. They are two views of a countershaded male figure, clearly visible on the left, and still faintly visible on the right. Courtesy the Thayer Family and Estate at www.AbbottThayer.com

FIGURE DISRUPTION

Paul Feeley (an American artist and teacher who had no connection to Thayer) once wrote that "Art is always about turning two into three or three into two." The same could be said of camouflage. Countershading turns two things into one (as does blending or background matching) in the sense that a figure no longer stands out. It exemplifies what might be called high similarity camouflage, or unit-forming (a term borrowed from Fritz Heider, a psychologist who used it in an essay on camouflage, cubism, and gestalt theory).[11]

But Abbott Thayer made other discoveries about surveillance and deception that could be more suitably classified as high difference camouflage, or unit-breaking (Heider again)— turning one thing into two, two into three, and so on. This was described very clearly in an article written by Thayer's son that was published in 1908 (the year before their book came out) in a popular, widely read monthly, *Century Magazine*.[12] The article ("The Concealing Coloration of Animals") and the book (*Concealing Coloration in the Animal Kingdom*) have all but identical titles, with the (possibly) inadvertent result that the article anticipates the book's release.

In that article, the younger Thayer announces that he plans to dwell on the "two main results" of his father's research. The first result was countershading, which we have discussed at length. The second is what Gerald calls "bold, contrasting patterns," often brightly colored, even iridescent. When the actual book came out, they used the

words "ruptive" and "secant" instead. Just as Abbott Thayer had become skilled at shading through drawing and painting, he was also well aware of the artistic importance of surface continuity and disruption. In particular, there is a passage (in a 1918 article) in which he talks about ruptive pattern effects in relation to artistic training: "As all painters know," writes Thayer,

two or more patterns on one thing tend to pass for so many separate things. All art schools will tell you that it takes a far-advanced pupil to be able to represent the patterns on any decorated object so true in degree of light and darkness as not to 'cut to pieces' the object itself, and destroy its reality.[13]

It was widely believed in 1908 (and to large extent still is) that while some animal coloration contributes to camouflage, other aspects function as conspicuous "display," for purposes of sexual selection and warning coloration. In Gerald Thayer's article, he (like his father) refutes this. He argues that all animal coloration, however conspicuous it is in "colorless collecting boxes or the plastered walls of a museum," is designed to function as "concealing coloration" in the context of its own natural habitat.[14]

Unlike man-made indoor settings, he writes,

The real outdoor world is a boundlessly varied pageant of ever-shifting lights and forms and colors, cut up into innumerable bolder and dimmer patterns of all kinds and sizes, dancing and altering in endless, kaleidoscopic show with the play of wind and sun and clouds.
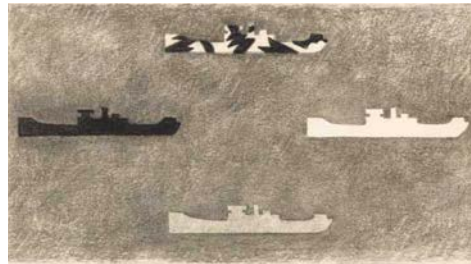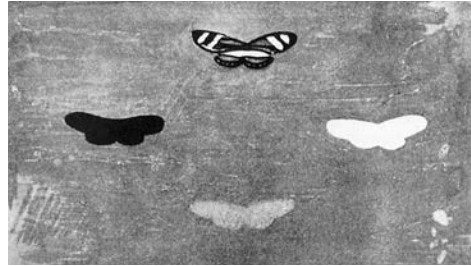
Fig. 9
In their book, the Thayers included this demonstration of the comparative visibility of monochrome butterfly coloration in contrast to disruptive, brightly colored schemes.

Fig. 10
At some point (the timing is not certain), Abbott Thayer made a series of drawings like this, as a way to show the possible use of figure disruption in ship camouflage. In the same series are full-color watercolor paintings that demonstrate disruption, combined with background matching. For published examples of these, see Post (2014).

In brief, ruptive patterns work because "the bolder, brighter, and more arbitrary such a creature's patterns are, the more they will cut up his own peculiar and characteristic form, and dissolve him into his background."

In the Thayers' book, one demonstration of ruptive patterns consists of a photograph of four butterfly shapes arranged on a middle-gray background (fig. 9). Three of the butterflies are monochrome (not unlike khaki field uniforms) in white, black, and a value of gray. The surface of the fourth butterfly is typical of the dazzling display on the wings of tropical butterflies. The caption beneath the photograph states that if that page of the book is viewed from a distance of

seven or eight yards in a bright light," the reader will find "that all three of the monochrome butterflies, even the dimmest, can be seen further, or in a less illumination, than the normally and brightly patterned one. This latter fades first.[15]

At the time of the Spanish-American war, Thayer and his longtime friend, the painter George de Forest Brush (and later also Brush's son, Gerome), had toyed with the idea of proposing military applications of protective coloration (it was not known as "camouflage" until 1914). As mentioned earlier, they experimented with the use of countershading on ships, but the Spanish-American war ended after several months, and their proposal to the US government went nowhere. At some point prior to World War I, Thayer turned to experiments using ruptive patterns for marine camouflage, as is shown by his drawings and paintings of ships, arranged and colored in a way that closely resembles

Fig. 11
Early in World War I, Abbott Thayer reached the conclusion that monochrome khaki uniforms were not only ineffective as camouflage, but that they contributed to the visibility of their wearers, in part because of shading. To demonstrate this, he constructed miniature panoramic landscapes on which he then tested disruptively painted paper figures. Courtesy the Thayer Family and Estate.

Fig. 12
Thayer also demonstrated disruptively-patterned uniform use by attaching scraps of cloth rags to an old jacket that was given to him by William James' sons. A photograph of Thayer (widely published in news stories about camouflage) shows him wearing the jacket, with his face streaked with greasepaint. The news caption claims that the model is a "British sniper," but in truth it was Abbott Thayer himself.

his earlier butterfly experiments (fig. 10). [16] On occasion they used the word "dazzle," but at first they did not recommend the use of ruptive patterns for ship camouflage—in fact, "my father," Gerald Thayer writes, "did his utmost to dissuade the governments concerned from any and all such attempts." [17]

Related to these were Abbott Thayer's attempts to improve the function of field service uniforms (the outfits issued to foot soldiers). After World War I began (although the US had not yet entered the war), he appealed to the British Army command to replace their monochrome uniforms with ones that were multi-colored and ruptive. To demonstrate this, he devised a series of small diorama back-drops—painted simulations of landscape settings—on which he then overlaid painted cut-out figures of soldiers, in multi-colored ruptive clothes (fig. 11). [18]

As another demonstration of this, Thayer used an old Norfolk hunting jacket that had belonged to William James, given to him when the philosopher died by James' sons, Billy and Alec, who were paint-ers and students of Thayer. To show how ruptive patterns work, Thayer attached to it a hodgepodge mix of scraps of cloth. When a photograph of this outfit was published in news reports in 1918, the person shown was said to be a "British sniper" or a "camouflage scout," but in fact the model was Thayer himself (fig. 12). [19]

BACKGROUND PICTURING

There is a third corollary in Thayer's understanding of animal coloration that is a greater challenge to grasp than countershading and disruption. It is difficult to explain, and neither he nor Gerald did very well in defining it. They even had difficulty nam-ing it, so that when their book came out, the concept was confusingly called "background picturing."

That term was unfortunate, because it made it sound as if an animal's appearance results in a literal "picture," a pictorial representation of a single, particular setting, as the Thayers seem to suggest when they refer to it as "a picture of such background as would be seen through it if it were transparent." But a few sentences later, it becomes evident that they mean not a picture per se but a generalized abstract pattern that functions as "a sort of compound picture of their normal backgrounds—a picture seemingly made up by the averaging of innumerable landscapes." [20]

In an essay on "Camouflage in Nature and in War," written in 1919, two years before his father's death, but not published until 1923 (perhaps because he dared to doubt his father's "extreme" views), Gerald makes another attempt to explain what background picturing is. But this time he gives it the alternate name of "picture-pattern," by which he "means a pattern which pictures, or imitates, the pattern of the object's background." [21]

The complexity of this idea is suggested by a number of illustrations in their book, one of which is a drawing of a bird within a setting of a "uniformly patterned horizontal ground plane" as viewed by an observer who is looking (slightly) downward (fig. 13). [22] The intention is to show how the animal's markings abstractly yet persuasively rhyme

Fig. 13
This is one of various examples, published in the Thayer book, that claim to show how so-called "background picturing" works.

with the perspective pattern of the ground. An even more striking example is a small but remarkable painting by Gerald Thayer of a *Male Ruffed Grouse in the Forest* (fig. 14).[23] The younger Thayer's masterpiece is an artful confirmation (and, in some ways, a grand deception itself) of all three of his father's ideas about the inner workings of camouflage: countershading, figure disruption, and background picturing.

In that painting, a grouse stands frozen in the woods. Its body is exquisitely countershaded, its surface deftly broken up by contrasting ruptive markings, which conveniently coincide with the sizes and angles of similar shapes in the wooded background. The bird's overall coloring and the twig- and leaf- and bark-like shapes that encase its patchwork body are precisely applied to result in—*Voila!*—another astonishing vanishing act.

Fig. 14
The Thayer book was greatly enriched by its use of vivid paintings of animal camouflage. Among the most accomplished is this exquisite watercolor of a ruffed grouse by Gerald Thayer. The original painting is in the collection of the Metropolitan Museum of Art.

1   For more on countershading, see M. Stevens and S. Merilata, eds., *Animal Camouflage* (UK: Cambridge University Press, 2011).

2   See E.R. Kandel, *The Age of Insight* (NY: Random House, 2012), 267-269.

3   "Out-of-Door Studies: Mr. Abbott H. Thayer, the Painter, on the Colors of Birds," *Boston Evening Transcript*, January 30, 1897.

4   G.H. Thayer, *Concealing Coloration in the Animal Kingdom* (NY: Macmillan, 1909). Full text and illustrations can be accessed at https://archive.org/details/cu31924022546406.

5   Ibid., 24.

6   A.A. Allen, "Concealing Coloration of Birds," *Bird Lore* (National Audubon Society, 1921), 321.

7   N. White, *Abbott H. Thayer: Painter and Naturalist* (Hartford CT: Connecticut Printers, 1951), 12.

8   N.D. Bowditch, *George de Forest Brush* (Peterborough, NH: Bauhan, 1970), 151.

9   A. Post, ed., *Abbott Handerson Thayer: A Beautiful Law of Nature*, Exhibition catalog (Washington, DC: Gold Leaf Studios, 2014), 50.

10   E.B. Titchener, "A Thayer Tiger," *American Journal of Psychology* 25, no. 2 (April 1914): 296-297.

11   F. Heider, "Gestalt Theory: Early History and Reminiscences" in *Historical Conceptions of Psychology*, ed. M. Henle, (New York: Springer, 1973).

12   G.H. Thayer, "The Concealing Coloration of Animals," *Century Magazine* (May 1908), 249-261.

13   A.H. Thayer, "Camouflage," *Scientific Monthly* (December 1918), 488.

14   G.H. Thayer, "The Concealing Coloration of Animals," 256.

15   G.H. Thayer, *Concealing Coloration in the Animal Kingdom*, precedes 153.

16   A. Post, *Abbott Handerson Thayer*, 58.

17   G.H. Thayer, "Camouflage in Nature and in War," *Brooklyn Museum Quarterly* 10 (1923): 165.

18   A. Post, *Abbott Handerson Thayer*, 46-50.

19   R.R. Behrens, ed., *Ship Shape: A Dazzle Camouflage Sourcebook* (Dysart, IA: Bobolink Books, 2012), 36.

20   G.H. Thayer, *Concealing Coloration in the Animal Kingdom*, 31.

21   G.H. Thayer (1923), 159.

22   G.H. Thayer, *Concealing Coloration in the Animal Kingdom*, facing 32.

23   The painting is reproduced in color in G.H. Thayer, *Concealing Coloration in the Animal Kingdom*, facing 38.

h(id)den

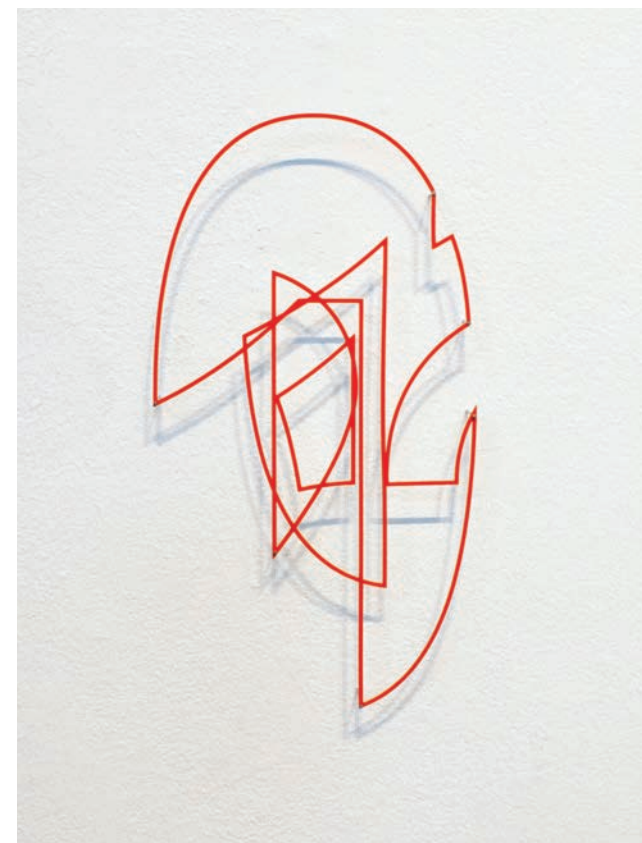**Project by Allison Greenwald**

h(id)den, a studio art thesis in typography and graphic design, explores the conflicting desires to share and obscure personal data. While making identifying information accessible is vital to communication and transactions, a pervasive discomfort surrounds its dissemination.

In my work, I investigate this tension by implementing a number of different systems of encryption, each designed to represent 400 characters of my personal information including my atm pin, bank account numbers, birth certificate number, credit card number, driver's license number, fake driver's license number, frequent flyer numbers, garage code, height, passport number, phone numbers, insurance policy number, social security number, student id number, and zipcode. The eight systems of encryption are presented in a variety of media, including a 23-foot wall installation and a series of seven laser cut "prints." The shadows created by the work, which is hung a few inches off the wall, suggest the digital trail we create throughout our lives.

In an attempt to reexamine digital encryption methods, the systems of encryption I created are inspired by the character's original encoding in Roman and Arabic typography. By taking the original encoding of my information and reimagining it in a new form, I hope to draw attention to the relationship between language, meaning, typography and encoding.

Viewers are encouraged to experience sharing their personal data through an iPhone app, also called h(id)den*, that encodes 25 characters of their identifying information in one of these systems and provides a platform for dissemination. The varying ease and anxiety of this data entry process provides an important moment of self-reflection for the viewer, who at this moment, experiences the vulnerability of the artist.
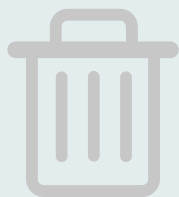
The app can be downloaded for free in the Apple App Store at https://appsto.re/us/tC1gY.i.
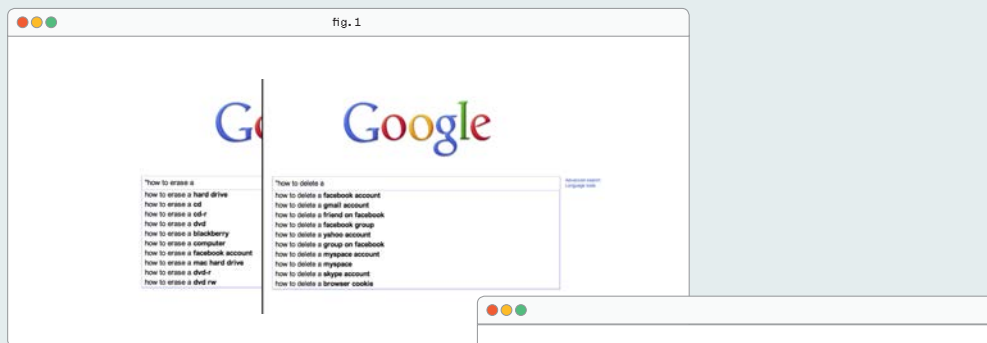
It is described as "a kind of suspended animation, a coma or waking death, oddly inert yet irreducibly physically present, hence its association with the uncanny, the unconscious, the dead." This object resides behind computer screens everywhere, ever expanding in its capacity, ever shrinking in its size, always connected—singular on the periphery or legion in the cloud.[1] It is the hard disk drive. The icon of digital storage media. Unto it memories are saved, upon it memories are recalled, and from it memories are erased.

Etymologically the words erase and delete are equivalent. Erase comes from the Latin *rādĕre*— to scrape, scratch. Delete is from the Latin word *dēlēre*—to blot out, efface.[2] Reflected in their etymology, both words capture a sense of material engagement. However, usage of these two words within Internet search queries demonstrate that they have come to mean two different things. A distinction that awakes the conscious to the materiality that persists in the shadows of digital media.

Materiality of Deletion

Essay by Christo de Klerk

Deletion takes place as a performance. It is enacted within a place, upon a ground—a surface of inscription. It often, if not always, requires an implement. Reinforcing this technological orientation of deletion is the required skillful application of the implement. To erase the inscription of a lead pencil one would select a rubber eraser and apply it to the page following a particular motion. Every erasable medium has its own particular procedure, its own rite by which former things are buried.

What is the complete object of deletion? What does it mean to delete it? What are the tools and procedures to perform the deletion? And to what level of certainty do individuals evaluate the effectiveness of a deletion method? Answers to these questions may begin with a web search since finding the tools and procedures is the subject of a number of Internet search queries. For this study Google's search results and tools are used, because of the quality of documentation the search engine makes available.

In an attempt to make the experience of searching the web more predictive, Google provides users with an autocomplete function as a query is entered into the search field. The list of terms that appears is harvested from a combination of sources, but generally reflect the most popularly searched terms matching a user's incomplete entry. Google claims the algorithmically generated and frequently updated list represents "fresh and rising search queries."[3]

fig. 1

"Erase" compared with "delete" in Google autocomplete. Source: screenshot from Google search by author.

As an experience of popular search terms, we may compare the list presented by the query "how to delete" with "how to erase." "How to delete" is completed with words such as Facebook, Gmail, Myspace, and browser cookie. "How to erase" is completed with words such as hard drive, CD, DVD, and computer (fig. 1). These lists may largely be divided into two media categories where erasure refers to physical media and deletion refers to content on a network or platform.

The two phrases are also distinct in the number of times they occur within queries. Google provides a tool that helps advertisers determine keywords to use in their campaigns. Known as Google Insights for Search, the tool compares the search volume over time between two or more queries. A comparison between "how to delete" and "how to erase" in figure 3 reveals a stable distinction between the search volume relative to one another between 2004 and mid-2007.[4] However, in 2007 "how to delete" queries increased steadily in volume over the following three years until present (fig. 2).

The rising volume of "how to delete" queries may correlate with the rising use of social networks. Assuming deletion is indeed more commonly associated with queries pertaining to online platforms such as social networks, the escalating volume would suggest a heightened urgency or difficulty on the part of users to find the appropriate method for deleting something online. The procedure is not as evident or intuitive perhaps as erasing a file from a medium such as a videotape or hard disk drive.

A search for the method to erase a videotape will return such tools as a magnetic media degausser. Powered by electricity, the tool is waved in a circular motion over the top of the videotape to depolarize the magnetic field suspended within it. Finding the right pencil eraser is described by one author as comparable to "fighting your way through [a] jungle."[5&6] Erasers come in different types, made from specific materials that effectively perform an erasure when handled in particular way. A kneaded eraser removes markings by a repeated dabbing action.

A search for the methods and tools for deleting a Facebook account or an old post on Twitter returns descriptions of the steps that must be performed. These steps may be long and are subject to regular updates, as the configuration of settings and the user interface on the platform changes. A tool may assist in performing the steps required for the user. Until recently, Seppukoo was a website that helped Facebook users in closing their account. The "virtual suicide" that the service helped users perform was partly intended to make users aware of Facebook's policy to only deactivate accounts and not fully delete them. "There's no death where there's no life," the authors of the service write. For even after the virtual suicide, "just a simple login, and your life will be completely restore back [sic]."[7]

The challenge to delete content on the Internet is the subject of some journalism. A recent *New York Times* article on "Erasing the Digital Past" not only reiterates the challenges involved, but tells of the industry that has developed to effectively keep names, images, or content offline.[8] There is the story of bankers spending $10,000 a month to "hide their names online" as news of the financial crisis developed. The methods included "fixing" Wikipedia, gaming search engines, and politely petitioning bloggers to take content offline.

Google Ngram of "erase" and "delete" occurrences as words in books over time.

fig. 2
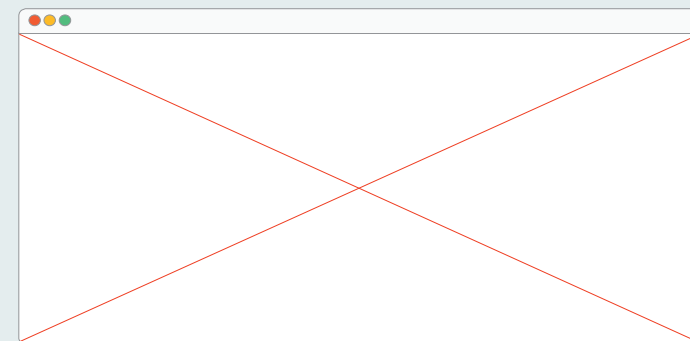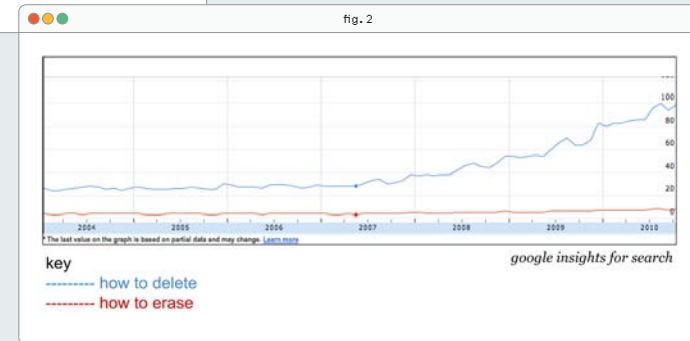
The Internet never forgets—a common refrain in the writing on deleting content online. As a metaphor for memory, the comparison is found in disease. "But like a metastasized cancer, the incriminating data had embedded itself into the nether reaches of cyberspace, etched into archives, algorithms, and a web of hyperlinks," writes the author of the recent *New York Times* piece.[9] And so is invoked a sense of that great unpardonable sin: to blaspheme against the Holy Spirit.[10] In a manner quite like a sin against the Third Person of the Holy Trinity, the offence is with a seemingly immaterial presence—something far away, in the "nether reaches of cyberspace," and yet also right here, on the screen, just behind the glass.

Whether it is erasing a document on a flash drive, deleting a post on a social network, or taking a website offline: What does it mean to delete something? These questions are the very opposite of what the archivist would ask.

"What does it mean to preserve digital objects?" asks Kenneth Thibodeau in his essay on digital preservation. In the challenge of adequately embalming the digital object for preservation, the corresponding challenge is the disposal of the digital object without trace.[11] A challenge that is representational. How to describe the object of preservation to more effectively address "policy questions, institutional roles and relationships, legal issues, and intellectual property rights." To this end, Thibodeau introduces a model to conjure up a complete picture of the digital object intended for preservation. The digital object takes form within three classes each with unique properties: a physical object, a logical object, and a conceptual object.

Erasing content from a hard drive is to manipulate an object that is altogether physical, logical, and conceptual. The physical object is the inscription on the hard drive—magnetic impressions performed planographically, heads floating on air over the spinning platters. The logical object is the manipulated unit of binary clusters ordered and processed through the computing infrastructure. It is the object that the software negotiates with the hardware. And the conceptual object is the projection on the screen or through the speakers that we recognize. It is the object we handle as if a physical object. Together these three classes form an inseparable unit.

"Obviously, we have to preserve digital objects as physical inscriptions, but that is insufficient," writes Thibodeau and so embarks on establishing the complexities that may manifest across the levels for preservation. For example, preserving a web page may mean tracking down all the related files (the style sheets, images, and javascript libraries) and browser software and its settings (Firefox 3 with Adobe Flash 10) that establish and define the page.[12]

fig. 3

PHYSICAL OBJECT   LOGICAL OBJECT   CONCEPTUAL OBJECT
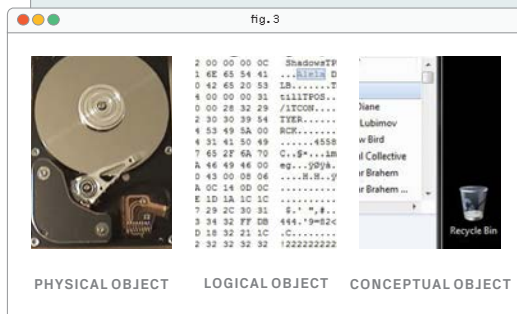
Representing the object of deletion; the computer file as a physical, logical, and conceptual object.
© Christo de Klerk

Deleting a picture from a web page may seem straightforward when the "trash can" is on screen, but beyond the pail on the LCD screen the influence of the gesture upon the physical and logical classes of the digital object is concealed from the screen. Removal of the picture is related to the conceptual object of the page at a specific URL hosted from a specific IP address. But the digital object, removed from conceptual awareness, may remain largely unchanged as a logical and physical object. And this does not mean that it is no longer a conceptual object either. It may exist within a different operating environment. The deleted file could still conceivably be seen in the desktop trash can or in the data recovery software. For example, a deleted Facebook picture will remain a file accessible on the Internet for months after it is removed.[13] All that is required to access the deleted image is knowledge of its precise URL.

As illustrated in figure 3, deletion takes place at the site of the three different classes of the digital object. The representation is deceiving, but meaningful. The conceptual object here is a music file. It will bypass the "trash can" when the shift key is held and the file dragged. However, within a hex or disk viewer the digital object will still be accessible, verifying that as a logical object the digital object is still intact. Only if the file is securely wiped will the disk editor represent that the logical object was removed.

Even methods of logically deleting a file vary as Peter Gutmann's discussion on secure methods of erasing hard drives has demonstrated.[14] Furthermore, there is the presence of a blank space to consider within the logical composition of the hard disk. A palimpsest indicating something was here— an absence that in the ordering of the rest of the disk drive, may be rather telling.

The representation of the hard drive performing a file deletion is also problematic. Behind the arbitrary seeming motions over the flat surface are targeted inscriptions. Under a Magnetic Force Microscope it is evident that these inscriptions are not necessarily perfectly inscribed, so deletions or overwrites can be detected. Somewhat like the frayed edges of a billboard, the physical inscription on a hard drive can be imperfectly overlaid, preserving some trace of the deleted digital object at the physical level.

To better frame the materiality that possesses the digital object beyond the screen, Matthew Kirschenbaum foregrounds the mechanisms that facilitate inscription and transmission in his book *Mechanisms: New Media and the Forensic Imagination*.[15] Kirschenbaum argues that textual understanding of the digital object relies on an awareness of the forensic and formal materiality of a digital object. Forensic materiality is used to refer to the physical manipulation of magnetic impressions on the rotating platters of a hard drive. He emphasizes the stability of the trace on the hard disk drive, which he says "rests upon the principle of individualization (basic to modern forensic science and criminalistics), the idea that no two things in the physical world are ever exactly alike."[16] At the forensic level, the magnetic trace is remarkably persistent. The forensic materiality of digital objects is evident in stories of data recovered from "deleted" drives sold on eBay and in the hard drives excavated and completely restored from the Ground Zero site at the World Trade Center.

Formal materiality on the other hand is an emphasis on the manipulation of symbols. It is the experience of buttons on the screen or blank pages that fill with writing. These are negotiations between applications and the operating system, conceptual and logical objects, beneath which occurs the material exchanges of inscription and erasure on the physical object, the hard disk drive. Formally a deletion may take place on the computer screen as a file in the trash can. The file, however, forensically may remain intact on the hard drive as a physical object.

"A digital environment is an abstract projection supported and sustained by its capacity to propagate the illusion of immaterial behavior: identification without ambiguity, transmission without loss, repetition without originality," says Kirschenbaum. However this tension between the formal and forensic materiality of the inscription reinforces the notion of symbolic exchanges, by taking place upon a computer tethered to a local hard drive.[17] We sense the gravity of a crashed hard drive somewhere near to the surface of the screen. The drive is here, the capacity for forensic analysis a daunting possibility.

fig. 4A

fig. 4B
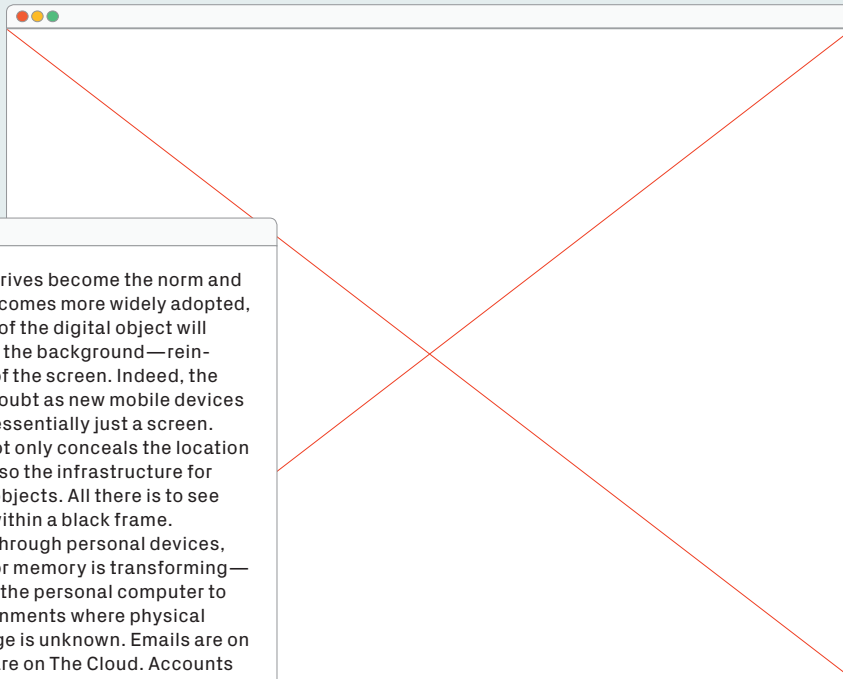
But as solid state hard drives become the norm and online digital storage becomes more widely adopted, the forensic materiality of the digital object will recede even further into the background—reinforcing the dominance of the screen. Indeed, the background itself is in doubt as new mobile devices present themselves as essentially just a screen. For example, the iPad not only conceals the location of digital storage, but also the infrastructure for transmission of digital objects. All there is to see is a screen suspended within a black frame.

While we interface through personal devices, the storage metaphor for memory is transforming—rising up and away from the personal computer to Cloud computing environments where physical location of digital storage is unknown. Emails are on The Cloud. Documents are on The Cloud. Accounts are maintained and shared across networks.

Where the unifying feature of the storage metaphor for memory is its personal nature, it is characterized by a much more social nature online. Websites share server space and emails are transmitted by being copied across nodes to their destination. A document shared online by multiple users over the Google Docs office suite is still committed to storage by clicking the icon of a floppy disk. This icon illustrates just how far removed the representation of the physical trace is from the reality of the digital object. Like the idea of the horseless carriage to represent the automobile, here the floppy disk represents something yet to be more adequately represented.

The personal desktop computer with its local digital storage device clarified modern psychology's description of the working of the mind. Douwe Draaisma in *Metaphors of Memory* traces the use of inscription media through history. Portable devices such as the ancient wax tablet and the renaissance writing tables were significant metaphors in the discourse of memory.[18] They emphasized its locatability and its orientation to the individual.
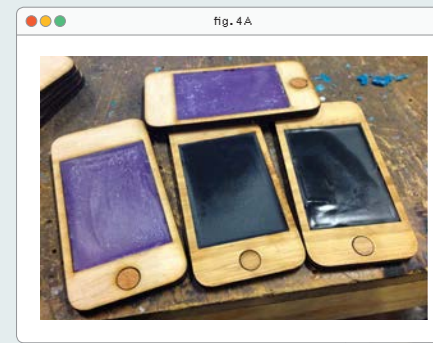
The inscription metaphor for memory has had a strong grip on the imagination since Plato and Aristotle. Anne Whitehead follows the inscription metaphor through to contemporary directions in the field of memory studies to emphasize continuity in academic thought on the subject.[19] Noticeable in this account is the increasingly subtle connection between memory and the transformations that took place in writing technology since the wax tablet. Reading and writing become simply remembering or forgetting, as if electronic writing technology is completely volatile and traceless in effortless reproduction. The conception of mind as a wax tablet endures though the mechanism of inscription has changed.

Recognizing the shift to collective memory under the inscribing trauma of wars in the twentieth century and in reflection on the different perspectives of Ricoeur and Derrida, Whitehead argues that the emphasis on memory studies today is footed in forgetting.[20] It is a precarious foothold, tense with materiality—objects against forgiveness. A tense space held between the hard places of amnesia and amnesty. In amnesia the psychological and material trace is buried and ignored. In amnesty the trace is put out of reach by law. A challenge focused on forgetting without amnesia, and forgiving without erasing the medium.

Wax tablet iPhones. The wax tablet as portable memory device is an enduring metaphor for memory. Source: images from the Medieval PDAs Makerbot project by Gavin Smith. thingiverse.com/thing:25772/.

Forgetting is equated with erasure. It is discussed as a virtue and even a right. The European Union's data protection reform bill aims to give Internet users the right to be forgotten from the Internet. The EU's rights commissioner describes the right to be forgotten as "essential in today's digital world."[21] Phrases such as "permanently delete" and "data fully removed" pepper speech on the reform, but what will effectively guarantee the complete elimination of the material trace? Even to remember that someone is to be forgotten requires keeping some sort of record. While the EU's data protection reform bill is represented as a mechanism to delete the digital object, it will likely do no more than enforce an awkward amnesty. The digital object will remain, but outside the reach of law until it is legal again to do so.

A similar scheme that makes light of the forensic materiality of the digital object, is Viktor Mayer-Schönberger's policy proposal at the end of his book, *Delete: The Virtue of Forgetting in the Digital Age.* Mayer-Schönberger argues that the development of digital memory runs counter to the biologically evolved faculty of memory. Forgetting is natural and even key to our survival.[22] Self-deletion ought to be a mechanism of digital storage, he argues proposing that digital content should have an expiry date. As a method of deletion, selecting an erase-by date would expand awareness of the materiality of digital inscription. He argues that this awareness would help realign user expectations of digital storage and subsequently digital storage to more closely resemble the human faculty.

Key to Mayer-Schönberger's argument for the institution of self-deletion technology is the assumption that memory threatens the present with haunting potentiality. While it is tempting to look past this presupposition to the policy recommendations and their explanations, a community's image of the past matters as much as the material it is inscribed upon. It shapes the object of deletion and establishes its association with individuals.

fig. 5
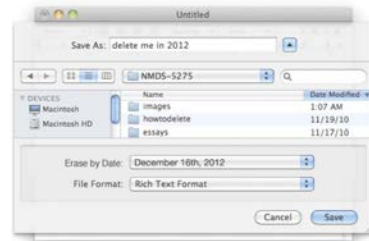
This file will self-delete. Would setting a self-deletion date on documents render electronic memory more human?
© Christo de Klerk

The shape of the past forms the reliable present, says classical historian Harriet Flower.[23] For ancient Romans, the threatening shape of the past was oblivion. Framing this particular image of the past was the limited distribution and public control of the surfaces of inscription. Publishing memory required effort and capital, with texts taking form in surfaces mostly fixed to place. The monuments, texts, and rituals that comprise the three essential media afforded a significant ability to target cultural memory with erasures and rewrites. Where a victory in battle today may be published and distributed through the trusted and archival media of film and newsprint, the Roman publication of victory would take form in a monument or ritual. These were among the accepted methods of remembrance; methods that gave place to memory in the public forum, but also identified the place for rewriting or erasing memory.

Flower establishes the common practice of systematic erasure in this era. Orders of erasure such as the anti-tyranny law of Ilion targeted specific inscriptions to be removed from public. The method of erasure demanded a competency in the performance of an erasure, detailing the technical treatment of the inscription surface in order to deeply eliminate the trace.[24] Erasures from the stone base of monuments were re-attributed. Ritual and social orders were also treated like an inscription surface communicative of cultural memory. Appointments to the priesthood were not only removed but also replaced in order to mask the erasure.

For Flower, the acute awareness of the materiality and place of cultural memory defined the resident of the city and the city itself. It furnished a kind of media literacy, where every act of remembrance was recognized to be political because the order to erase or rewrite was public. Unlike digital storage media where the physically inscribed surface can be far removed from the place of retrieval, in ancient Rome the place of memory would also be the place of physical inscription. The distance, diversity, and distribution of memory practice today may furnish a sense of security from oblivion. However, the appearance of the record as severed from material presence means memory is out there and beyond any control—awaiting in suspended animation to be reconstructed.

The places of private memory are public. They were public in antiquity and they are becoming public again. Instead of fearing this we can recognize continuity with the ancient Roman experience of the place of memory in the public square. Recognizing that in the materiality of our symbolic exchanges, we are bound to make inadequate preservation of the present and incomplete erasures of the past. If not any more intentional with our preservation or certain of our erasures, we may at least become less fearful and more forgiving: laying to rest the past with adequate ceremony. Not with fearful trepidation, but with hopeful expectation of resurrection.

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18 D. Draaisma, *Metaphors of Memory: A History of Ideas about the Mind* (Cambridge: Cambridge University Press, 2000).

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Surveillance by Rick Valicenti
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Magdalena Wistuba

Big brands by day, intimate art galleries by night. Kyle Fletcher, is a weathered optimist who knows how to put his midwestern nose to the conceptual grindstone. Excels in environments that are eager to explore the unknown.

usklf.com
@kyleluvsew

Alex Fuller is one of seven partners in the artist collaborative called The Post Family (thepostfamily.com), founder of 5×7 publishing (5×7books.com) and a Design Director at the Leo Burnett Dept. of Design (lbdod.com).

Alex has worked with many blue chip clients including UPS, Sprint and Allstate as well as independent innovators including Unison, Sonnenzimmer and You Are Beautiful.

Alex maintains a very active role in the art and design communities in Chicago whether it's leading lectures and workshops with The Post Family or critiquing student work through the AIGA.

alexfuller.com
@Myhighsandlows

Alex Gilbert is a Chicago-based designer, illustrator, and printmaker. He enjoys working with nonprofit organizations and collaborating with other creatives. He currently designs for Ranquist Development Group, prints for Spudnik Press, and is acting Membership Director for the Chicago Design Museum.

alexggilbert.com
@alexggilbert

Kyle Green is a designer who is always looking for new ways to experiment with form. He focuses his experimentation within the area where the digital world intersects with the physical. Kyle has practiced professionally in both New York and Chicago, working with clients such as Robert A.M. Stern Architects, Cummins Inc. and Yale University. He is currently pursuing a MFA in Graphic Design at the Rhode Island School of Design.

kyle-green.com

Jinhwan Kim is a designer at IA Collaborative where he brings a diverse background in the United States for brands like Herman Miller, United Airlines, FedEx, and Nike. Jinhwan received his MFA in Graphic Design from Maryland Institute College of Art(MICA). He was a Graduate Fellow at The Center for Design Thinking where he contributed original content and design for the forthcoming book, *Type on Screen: New Typographical Systems* edited by the program director, Ellen Lupton. Jinhwan's passion lies in experimental typography, motion graphics, and robotic digital platforms. He is a simple, classic, and detail-oriented designer.

jinhwankim.com

Baozhen Li is an industrial designer and 3D animator practicing at Thirst. She has a Bachelor of Fine Arts in Industrial Design from the University of Illinois Urbana-Champaign. As an artist, she works in diverse mediums from painting to metal-working to digital media. Her work is on display throughout the city of Chicago and may currently be seen at the Illini Union of UIUC and in the atrium of Ogilvie Transportation Center.

@baozhenator

Jennifer Mahanay is the Art Director at Wright, the premier auction house for modern art & design in Chicago & New York. Her work has been recognized in the STA Design Archive, UnderConsideration, and Communication Arts, among others. At Wright, she proudly directs a creative team of designers, photographers, and programmers to develop and carry forth the Wright brand. No matter the media, her thrill as a designer is found in working big ideas down to the tiniest details. Making beautiful things is a passion—collaborating with other creatives is her privilege.

jennifermahanay.com
@jmahanay

Mike McQuade has over nine years of experiences as a multidisciplinary designer and illustrator. He believes that hard work, persistence, and a strong focus on craft leads to better work for his clients and other self-initiated projects. Mike describes his style as raw and always transforming. Mike is currently working as an art director, designer, and illustrator for both large and small brands, various ad agencies, editorial publications, design firms, start-ups, and his own self-initiated projects and artwork.

mikemcquade.com
@mcqtweet

Jason Pickleman, Dan Marsden, and Leslie Bodenstein run the JNL graphic design in Chicago. Since 1992 the studio has produced design that looks like art, and art that looks like design. Boundaries don't interest them. Ambiguity does. Appropriateness, however, never hurts.

jnldesign.com

Bud Rodecker is a principal designer at 3st and an adjunct professor at DePaul University. His work explores the space between logical constraints and formal play, and balances form with meaning. He is interested in systems and processes with the potential to create design.

3st.com
@budrodecker

Rick Valicenti is the founder and design director of Thirst/3st, a communication design practice providing design and immersive environments for high-profile clients in the architectural, performing arts, and education communities.

His work has been exhibited at the Metropolitan Museum of Modern Art (MoMA), resides in the permanent collections of both the Yale and Columbia University libraries, Denver Art Museum, and the Art Institute of Chicago, and has been published in The New York Times.

3st.com
@3stDesign

Magdalena Wistuba is a designer and artist interested in public language use. She was born in Santiago, Chile and studied cognitive sciences in Houston, Texas prior to moving to Chicago in 2011. She holds a MFA in visual communication design at the School of the Art Institute of Chicago.

magdalenawistuba.com
@magplease

Ambient Information Systems is a practice founded by intermedia artists Manu Luksch and Mukul Patel. Their work interrogates conceptions of progress through the devising of tools and frameworks and the instigation of processes, with a strong emphasis on research and dissemination. Recent works have addressed surveillance, corporate data harvesting, and the regulation of public space, and have been shown at ARoS Art Museum (Århus), Centre Pompidou (Paris), NTT-ICC (Tokyo), and Eyebeam (New York).
ambienttv.net

Designer and author Roy R. Behrens is Professor of Art and Distinguished Scholar at the University of Northern Iowa. He has published seven books, hundreds of journal and magazine articles, and has been interviewed on PBS, NPR, BBC, Australian Public Radio, and in documentary films.
uni.edu/artdept/behrens.html

The Central Intelligence Agency (CIA) is an independent U.S. Government agency responsible for providing national security intelligence to senior US policymakers. The Director of the Central Intelligence Agency (D/CIA) is nominated by the president with the advice and consent of the Senate. The Director manages the operations, personnel, and budget of the Central Intelligence Agency. The CIA is separated into four basic components: the National Clandestine Service, the Directorate of Intelligence, the Directorate of Science & Technology, and the Directorate of Support. They carry out "the intelligence cycle," the process of collecting, analyzing, and disseminating intelligence information to top US government officials.
cia.gov
@CIA

Christo de Klerk is a design researcher and artist interested in the interface between publics and the city through media technology for accountable governance. His current project, MicroAct, aims to understand and support place-based community action by documenting tactical urbanism and media methods around the world.
christodeklerk.com
@mujalifah

Iker Gil is an architect, urban designer, and director of MAS Studio. In addition, he is the editor in chief of MAS Context. He is the recipient of the 2010 Emerging Visions Award from the Chicago Architectural Club.
mas-studio.com
@MASContext

Allison Greenwald is a graphic designer who recently graduated Phi Beta Kappa from Wesleyan University with a BA in Studio Art and Sociology. Her work explores typographic systems and large scale wall decoration. As the recipient of the Mortimer Hays Brandeis Traveling Arts Fellowship, she is currently living, studying, and collaborating with wall painters in South Africa, Lesotho, Ghana and Burkina Faso.
allisongreenwald.com

Dan Hill is the Executive Director of Futures at the UK's Future Cities Catapult. A designer and urbanist, he has previously held leadership positions at Fabrica, SITRA, Arup, and the BBC. He writes regularly for the likes of *Dezeen, Domus*, and *Volume*, as well as the renowned blog *City of Sound*.
cityofsound.com
@cityofsound

Luzinterruptus is an anonymous artistic group, who carries out urban interventions in public spaces. We use light as a raw material and the dark as our canvas. The two members of the team come from different disciplines: art and photography and have wanted to apply our creativity in a common action, to leave lights throughout the city so that other people put them out.
luzinterruptus.com

Simon Menner is a German photographer whose work has explored the subject of surveillance extensively. His most recent publication is *Top Secret: Photographs from the Stasi Archives* (Hatje Cantz, 2013). In 2007, he received his Master of Fine Arts from the Universität der Künste in Berlin. He has lived in Berlin since 2000.
simonmenner.com

Ruben Pater has a mission to create visual narratives about complex political issues. By visually translating these stories he aims to activate the public, and to create new relations between journalism and design. He studied at the Master program of the Sandberg Institute in Amsterdam, and he is currently teaching at the Design Academy in Eindhoven.
untold-stories.net
@unlisted_roots

Bernhard Reuss studied photography at University of Applied Sciences and Arts, Dortmund. He has numerous works with the camera obscura and has recently engaged in a gallery project. He lives and works in Wiesbaden, Germany.
the-traveller.org

Isaac Rooks is a Graduate School Fellow and Ph.D. Student in the Critical Studies Division of USC's School of Cinematic Arts. His research centers on depictions of landscapes and animals in film, particularly in horror fiction. Think: films where animals attack.
clawedup.tumblr.com
@Isaac_Rooks

Jens Sundheim studied photography at University of Applied Sciences and Arts, Dortmund and University of Plymouth in Exeter, England. He lives in Dortmund, Germany and works wherever his travels lead him.
jens-sundheim.de
the-traveller.org

John Tolva is the leader of PositivEnergy Practice, a Chicago-based clean tech systems engineering firm for buildings and cities. He served as Mayor Rahm Emanuel's Chief Technology Officer for the City of Chicago from 2011 to 2013. From 1998 to 2011 he worked for IBM on applications of technology in cultural, social, and environmental domains.
ascentstage.com
pepractice.com
@johntolva

Henrietta Williams is a photographer and videographer based in London. Her work often explores urbanist theories; particularly considering ideas around urbanism, security, and defense. In 2005 she completed a BA in Fine Art Sculpture at the National College of Art and Design in Dublin, and in 2008 graduated with a distinction from an MA in Documentary Photography at the London College of Communication.
henriettawilliams.com
@henri_mwilliams

MAS Context Team

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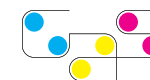
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WRIGHT

MAS Context
Issue 23 / Fall '14
Ordinary

This issue seeks to explore the value of commonness and the everyday environment. It will focus on those elements that go unnoticed or that we take for granted, from buildings and objects to experiences and traditions. We will look at the ordinary elements of life that are worth rediscovering and celebrating, as well as look ahead to what will become ordinary in the future.

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will be published in early September 2014.

Surveillance by Mike McQuade
Surveillance has threatened any shred of privacy we as Americans once had. When we think of wallpaper, we think of warmth, safety and home, so weaving surveillance cameras into traditional wallpaper shows how inescapable the realities of surveillance have become.

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