The Game and 'The Stack'
The Infrastructural Pleasures of 'Pokémon Go'

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In the summer of 2016, the phenomenal, global success of *Pokémon Go* (Niantic 2016) suddenly demonstrated just how effectively a game can recalibrate the way in which broad audiences engage with urban space. The game is played on mobile devices, primarily smartphones. The player's location is tracked by the device's GPS function and displayed as an avatar standing on a map. The map also reveals the location of nearby places of in-game interest, such as 'PokéStops' where resources can be harvested and Pokémon gyms where teams of players can play against each other. These places of in-game interest are typically laid on top of places of cultural, historical or social significance, for example, a supermarket, a library, a statue in a park, or a plaque marking where firefighters gave their lives to save others.

Virtual Pokémon creatures are spread out over the real world and when a Pokémon is nearby, the player can try to catch it by holding up their device and using its camera function. The screen displays the world as seen through the camera but overlaid with augmented reality (AR) graphics that includes a Pokémon to be caught. *Pokémon Go* has players physically moving about, with the health benefits physical activity entails, and in many instances walking into or paying attention to parts of their environments they had previously overlooked. More controversially, the game – currently played in a very early, perhaps somewhat premature version – has led players to enter private places without permission and to play in contexts (such as Holocaust memorials) or at times (such as press briefings) that many deem inappropriate.

In the following, I will use *Pokémon Go* as my core example as I connect Benjamin Bratton's recent Stack model of urban space with contemporary gaming (Bratton 2015). In an early, influential text, Espen Aarseth (2001, 169) proclaimed spatiality the core theme of computer games aesthetics: "Computer games […] are allegories of space: they pretend to portray space in ever more realistic ways, but rely on their deviation from reality in order to make the illusion playable". But what kind of "realistic" space do computer games allegories? In Aarseth's two main examples, *Myst* (Cyan 1993) and *Myth* (Bungie Software 1997), the spatial realities

allegorised by games include the landscapes, the contrast between nature and civilisation, and the contrast between indoor and outdoor. The approach usefully situates game spaces in a larger cultural history of space and place, a result pursued explicitly by Alison Gazzard (2013) in her monograph on mazes, where lines are drawn backwards in time from the digital mazes of today's computer games to mazes made of garden hedges and slabs of granite. Bratton's Stack model of urban space is a useful addition to game studies' analytical toolkit because it allows us to connect contemporary ludic spaces not only with spaces of the past but with contemporary urban spaces as well.

'The Stack'

In his book, Bratton captures the extraordinary changes that space itself has undergone in the twenty-first century, driven by the very digital technology of which computer games are part. Social media, GPS mapping, drones, tiny cameras and microphones, online shopping, mass surveillance, mass collection of data, *Google Earth*, visualisations of global data streams, and much more are changing the cognitive category 'space.' These phenomena are increasingly accessed through personal mobile devices, are increasingly interlinked (drones get camera eyes, Amazon employs drones, every instance of activity is logged and fed into data streams), and together they form what Bratton calls 'The Stack,' a megastructure comprised of six interconnected layers: Earth itself, with the very substantial energy and mineral resources needed for global computation, a cloud-layer where we find media empires such as Apple and Google, followed by the city-, address-, interface- and user-layers. I will use Bratton's Stack as the primary theoretical framework for a reading of *Pokémon Go*, and occasionally mention other kinds of games as well, but I will not exhaust the model's usefulness for interrogating the connections between gaming and urban space. I will use the six layers as a rough guide, starting with earth and moving my way upwards. Towards the conclusion, I will suggest that Bratton's technical account can be usefully complemented by attention to the pleasures available to those who insert themselves in dynamic structures, be they architectural or ludic.

Although Bratton points to many examples that are tentatively presented as evidence of how global computation congeals into 'The Stack,' he is not certain that the megastructure presently exists – or that it will ever exist. His six-tiered model is as much a description of something glimpsed at the horizon as it is as a design brief: as humanity only half consciously inserts itself (and planet earth) in 'The Stack,' Bratton calls for a more conscious approach, that is, for design to replace accident. Again, introducing Bratton's model by way of contrast to Aarseth's comments on computer games as allegories of space: Aarseth finds the expressive

power of computer game spaces in the difference between real and illusion, Bratton's model is motivated by interest in the difference between present phenomena and a hypothesised future – and the possibility of shaping that future.

One of the most fundamental conceptual moves Bratton (2015, 65) performs, and one that immediately makes him interesting for game studies, is to prioritise the vertical, indeed, to aim for "a political geography for which the vertical is on equal footing with the horizontal and demanding its overdue tribute." Here, Bratton positions himself against, or at least in a complementary position to, social theory that has the network as its overall, guiding idea. This mode of thought has been on the rise since the 1990s and Manuel Castells (2010) remains a particularly clear and influential proponent of network theory. Using the most panoramic, historical canvas available, Castells suggests with broad strokes that the vertical hierarchy and the horizontal network have been competing as fundamental organising principles of social life since the dawn of life itself, each principle bringing unique strengths and weaknesses to society. As the two principles are mutually exclusive, is has never been possible to combine their strengths – until, that is, the advent of the Internet. In popular versions of network theory, flexible, flat, democratic, adaptable networks win out over inflexible and proto-totalitarian hierarchy, and the Internet has routinely been interpreted as a technology inherently on the side of networks. As the name 'stack' already implies, Bratton view networks not from a bird's eye perspective, giving an impression of two-dimensionality, but finds a slanted perspective. This allows Bratton to notice that global, networked computation is not so much dissolving borders, as the naivest network narrative would have it, but is multiplying and deepening them. A nation state does not, for example, only find the job of policing its border made more complex by 'The Stack,' the nation state also sees entire new layers into which it can project its sovereignty.

The slanted stack-perspective should be intriguing to a multidisciplinary field, game studies, that found a two-dimensional model at the centre of some of its foundational debates. That model is Johan Huizinga's (1998) 'magic circle,' which doubles as a model of how games are organised in space (arena, football field, playground etc.) and a model for their cultural and psychological functions in society (an activity divorced from work and other practical pursuits). Despite its usefulness in design teaching (Salen/Zimmerman 2004), the magic circle has often been found wanting as a model for contemporary, digital gaming with its often tight connections between play and everyday life. This has triggered critical reflection on how to improve the model, for example, by replacing smooth circles with puzzle pieces (Juul 2008) or by replacing it with Goffmanian frames (Glas et al. 2011). Thoroughly replacing the magic circle with 'The Stack' – replacing a two-dimensional model with a three-dimensional one – would produce a theoretical framework for a spatiality- and future-oriented version of Platform Studies (Montfort/Bogost 2009).

Bratton's work extends a tradition for critique of capitalism's structuring of space found at the crossroads of French philosophy and sociology. That micro-tradition took off in the 1960s and 1970s with Guy Debord and Henri Lefebvre, continue in the 1980s with Michel de Certeau and ends in the 1990s with Marc Augé's work on supermodernity. Apart from passing references to Debord and Lefebvre, Bratton (2015, 16) casually inserts himself in this tradition by placing his work at a point in time where "we are brought to a certain *end of nonplace*." Non-place is a concept suggested by Augé (1995) to describe a kind of emplaced placelessness characteristic of 'supermodernity.' In Augé's account, traditional (or 'anthropological') place used to be characterised by three kinds of ties: historical ties, social ties, and the ties that places have with other places. In contrast, non-places such as supermarkets and airports lounges are characterised by their lack of such ties. Upon entering a non-place, one is filled with a ('supermodern') sense of weight- and placelessness, notions that resonate closely with 'New Media' discourses emerging in the 1990s. Today, such notions have lost their explanatory power. It turned out, after all, that "even as strange geographies corrugate, fracture, and smear worldly scale and tempo, the ground isn't somehow evaporating into virtual information flux" (Bratton 2015, 16). In stack-terminology: every time a human or non-human *User* initiates a *session*, a *column* of activity shoots through the stack, down from the local to the global and back up again. These processes are not at all virtual but make serious demands on the resource of the earth and play an increasingly important role in the allocation of these resources – a point Bratton makes by including an earth-layer in his stack-model.

Layer 'Earth'

The stack's bottom layer is earth, where extensive coordination and extraction of energy and mineral resources take place. The stack's energy usage is growing very fast, is very extensive – measured in carbon consumption, the Internet in itself already costs us more than the global airline industry (ibid., 92) – and is very inefficient – in 2007, roughly one third of energy consumed in India was unaccounted for (ibid., 95). As the stack's energy consumption rises, energy flows are increasingly monitored and regulated by the stack in efforts to spend energy more efficiently. The total mapping of energy and resource flows, presented as digital visualisations, has cumulative, cognitive effects on human users: "the world itself is seen as *being* information" (ibid., 87). Many visualisations, for example, *Google Earth*, give a sense that a total overview of this world-information is possible (see also the *WebGL Globe*-project). Massively multiplayer online games (MMOs) such as *World of Warcraft* (Blizzard Entertainment 2004) can be added to the list of platforms that further a Stack sensibility towards the Earth. Such games allow players

to travel vast online landscapes but a lot of playing time is typically spent harvesting herbs, mining minerals or killing animals and monsters. These resources appear regularly and according to fairly fixed patterns.

Being aware of the patterned nature of such flows of resources, for example, the places where iron ore appears, is very useful for the player. Instead of relying on basic awareness, it is, however, more efficient to keep track of where you have found iron ore in the past by using a bit of extra software added to the game, and it is much, much more efficient to have software upload this information to a central database where it is collated with information uploaded automatically from thousands of other players, and then have all the iron ore deposits presented on a map that forms part of the Graphical User Interface (GUI) of the game (on the stack's interface-layer). This service is a clear, if somewhat simplified expression of how the Earth layer connects with the rest of the stack. An even clearer example can be found in the fictitious massively multiplayer online role-playing game *T'Rain*, which is at the centre of Neal Stephenson's (2011) novel *Reamde*. Here real-world and game-world economics are designed to effortlessly connect, and the game world economics is based on a simulation of geology, making the *T'Rain* earth-layer information in a quite literal sense. The columns shooting up and down 'The Stack' of this fictional world might originate with actions of real-world users but echo in earth-layers that are hard to fix completely in either a *T'Rain* or real earth-layer; and that blurring of perception is precisely part of the cognitive effect of 'The Stack.'

Google Earth plays a major part in Bratton's study as the clearest example of a mapping exercise that creates a sense of total overview of planet earth. There are direct, biographical links between *Google Earth* and *Pokémon Go*. In 2004, Google acquired the company Keyhole and its core product, *EarthViewer 3D*, which was then relaunched as *Google Earth* in 2005. Keyhole had been founded in 2001 by John Hanke and others and Hanke would later become part of the team behind *Pokémon Go* (Bogle 2016). Use of *Google Earth* and *Pokémon Go* are characteristic of the kind of activities found in the stack's cloud-layer. When a user initiates a cloud session, the user's device becomes an access point to the cloud's vast resources of data and computation (relatively little goes on in your device itself). Setting up and maintaining such services is the job of vast corporations who do not so much generate as they collect and analyse information; as Bratton (2015, 125) puts it, for such corporations "*the index is the innovation*." Users are typically paying the cloud empires for their services not directly with cash but by contributing to the indexing of information: every time a Google Search result is acted on, the index grows a little bit more useful and a little bit more valuable. Similar mechanisms allow players of networked games to pay in cognitive labour rather than money.

Example: China

As more information is always better, all information must be best, feeding into the drive towards total overview that is part of 'The Stack's' ethos: Here things become contentious, as the imperial ambitions of cloud companies jar with the ambitions of more traditional empires. Bratton's core example is the relationship between Google and China. Google's corporate mission statement is "to organize the world's information and make it universally accessible and useful." Literal fulfilment of that mission requires access to all information in the world and its availability to every single person in the world, including China. At first, however, Google followed national requirements for offering search services in China: search companies must refuse to deliver results for Internet searches that contain certain words, for example, the names of individuals and organisations that the state sees as threats to social stability. Google then reversed its policy of compliance and eventually had to withdraw to Hong Kong where Google Hong Kong search is still available. Access to other Google services such as *Google Maps* and Gmail is occasionally possible in (parts of) China but not in any predictable and stable way. Although Bratton quotes one of the architects behind China's 'Great Firewall,' Fang Binxing as saying that "the Chinese Internet does not have the capability to disable a global Internet service whenever it wants to" (ibid., 113), the American cloud empires are not able to operate unhindered within Chinese territory either. What Bratton overlooks – being very focused on the fact that for the time being, every cloud empire with realistic ambitions of global dominance is a US-company – is the growth of Chinese cloud empires such as Baidu, Alibaba and Tencent, the so-called BAT. Bratton sees the Google-China conflict as one between

> two logics of territorial control. One of these sees the Internet as an extension of the body of the state […] and another sees the Internet as a living, quasi-autonomous, if privately controlled and capitalized, transterritorial civil society that produces, defends, and demands rights on its [own] and which can even assume traditional functions of the state for itself (ibid., 112-13).

A critique of varying logics of territorial control is important but as the case of *Pokémon Go* shows, cloud conflicts can sometimes be understood in slightly more straightforward ways, as new means of enacting traditional national conflicts. *Pokémon Go* is unavailable in China, but Chinese players managed to play the game by tricking their GPS-enabled devices into functioning as if they were in Japan, then using a walking simulation to move about. Using these workarounds, one player came across the infamous Yasukuni Shrine where Japan honours those who have fallen for the country, including more than a thousand convicted war criminals; visits to the shrine by high-ranking Japanese officials, including prime

ministers, frequently angers Japan's neighbours who were victims of Japanese war atrocities during the Second World War. This shrine happens to also hold the location of a Pokémon gym, one of the places over which teams of players fight for control. It was to the expressed delight of many Chinese social media users when a team of Chinese *Pokémon Go* players, using the illicit means just described, managed to take control of the Pokémon gym at the Yasukuni Shrine and post pictures of a Dragonite Pokémon named "Long Live China!!!!" at that location (Fu/Yamamitsu 2016).

Here an AR-game played on top of urban space already loaded with extraordinary amounts of cultural significance becomes a new tool for making a point in social media: not merely by writing a message on a social media platform but by writing a message onto reality itself (if we count AR as part of reality). That is fascinating in itself, and it might be a precursor of new, stranger online conflicts, but the underlying territorial logic is a very traditional one, with the nation state taking centre stage and public support for the nation informed by the history of past territorial violations. If anything, Chinese Pokémon occupation of the Yasukuni Shrine indirectly strengthens the power of the People's Republic of China government as it feeds into nationalist sentiments; "the Internet as an extension of the body of the state," as Bratton had it in the quote above. The traditional logic of state-driven territorial control hijacks transterritorial civil society for its own purposes. Something similar happened three days after the July 6th, 2016 launch of *Pokémon Go*, when the thinly veiled Chinese copy, *City Elves GO* (Tanyu.Mobi 2016) was launched. Although policies such as the 'Great Firewall' or the 2000-14 ban on foreign gaming consoles have political objectives, these objectives blend together with economic ones: shielding the domestic digital entertainment industry from foreign competition might allow the industry to develop domestic alternatives to US and Japanese entertainment services. A successful domestic digital entertainment industry might also help China project the soft power it attempts to accumulate with such urgency (Liborriussen et al. 2016). At least in the case of China, first evidence suggests that AR games such as *Pokémon Go* work towards extending the body of the state – a body with contemporarily soft and digital curves, that is – rather than towards establishing 'transterritorial civil society.'

Pokémon Go is played in the city-layer of the stack. Here Bratton (2015, 164) notes that "[t]he mobile device's interface […] can index and express The Stack's organization of the city as the *City* layer with greater explicitness than any building-scale morphology." What Bratton has in mind when speaking of building-scale morphology, is the kind of buildings that adhere to principles of parametric architecture. Here architects find new news forms by shepherding digital simulations, resulting in design that makes and projects smart use of resources, for example, by repeating and varying particular elements in both efficient and visually pleasing ways. The result can be built space that feels like materialised digital flows rather

than space whose design is merely supported by digital tools. Yet Bratton finds the role of mobile devices in directing the activities of urban populations even more emblematic of the 'The Stack's' impact on the experience of urban space. If there is a competition to most explicitly express a city-layer underpinned by earth and cloud and overlaid with address-, interface- and user-layers – and by extension to train the user to inhabit 'The Stack' – computer game spaces easily beat both parametric architecture and mobile device interfaces.

Users in 'The Stack'

MMOs' interfaces are frequently overlaid with dynamic information aimed at both spatial navigation and the efficient extraction of resources. Explorers of *Fallout 4*'s (Bethesda Softworks 2015) Boston or *Batman: Arkham Knight*'s (Rocksteady Studios 2015) Gotham navigate urban spaces with the aid of fictional aids – the nostalgic Pip-Boy for *Fallout*, hologram communication for *Batman* – that thematise both the character and its player as Users in 'The Stack.' It is only fitting that the fictional navigation device of the *Fallout* series, the Pip-Boy (Personal Information Processor-Boy), has become an icon of the series. The Pip-Boy is a rather bulky, wrist-worn device that collects and displays information such as maps (parts of the world you know) inventory (things in the world you have collected), and statistics (monsters killed, money earned, avatar attributes etc.). The Pip-Boy is emblematic of a stack-like attitude to the world-as-information. *Fallout 4* even comes in a deluxe *Pip-Boy Edition* that includes a Pip-Boy replica, essentially a plastic casing that holds the player's smartphone. When the player has downloaded the *Fallout* app, the smartphone can be worn as a Pip-Boy and support play by displaying maps, inventory and all the other information just listed. The player's smartphone, the core device for accessing the city-layer of the stack, has been transformed into the core device for accessing a game world. The smartphone's function is not changed by this, it is clarified: the smartphone as access point to the world-as-information, a world that can be measured, mapped and manipulated in its totality. The flip side is that the player-user becomes part of 'The Stack': as a contributing user to the evermore useful cloud indexes, as a collection of data, for example, biometrical data collected, displayed and shared by the smartphone and avatar attributes collected, displayed and shared by the smartphone/Pip-Boy.

To play a networked game, be it *Pokémon Go* or an MMO game, is to not only draw on the resources organised by 'The Stack' (resources ultimately, in a stack to come, corresponding to the entire world) but also to become a subject of the stack, to be addressable by 'The Stack'; we are now at Bratton's address-layer, above 'City' and below 'Interface.' To play the game, 'The Stack' must know your position. Ulf Wilhelmsson (2001) draws on Maurice Merleau-Ponty to articulate the idea that

a player of a game inhabits 'point of being' rather than a 'point of view' (the term from film studies). The point of being is characterised by the capacity to act rather than the capacity to perceive. The significance of this distinction becomes clear when thinking about the difference between a game's three-dimensional space and its maps. Unlike the results of traditional cartography, in-game maps are not imperfect drawings of the world based on empirical observation but renderings of the world that carry just as much ontological weight as the game's three-dimensional space. Therefore, the player 'is' as much the avatar running through the streets of Gotham as the little dot moving on a corresponding, two-dimensional map. If, however, we think of being in terms of the capacity to act, there can be no doubt about where the player 'is': it must with the avatar, as this is where the player finds the highest potential to perform meaningful action in the world (Liboriussen 2014). With a networked game, however, the player's being in the game world rests on the cloud: if you do not appear to 'The Stack' you cannot exist in the world. Your position in the (game) world must be specified in the cloud, on some remote server, rather than in the memory of your own computer. It would seem that point of view does ultimately trump point of being, but it is 'The Stack's' point of view, not the player's.

The Interface-Layer

'The Stack' shares its point of view, its total overview, at the Interface layer: Here simplifications must necessarily be made to provide a useful image of the world. Such simplifications need to be scrutinised to ensure that we do not let the "persuasive graphic authority" of maps, as Cosgrove (2007, 104) puts it, blind us to the fact that even the *Google Maps* underpinning *Pokémon Go* are not pure, ideologically neutral representations of the world. It is tempting to think of maps as neutral representations, neat little mini-worlds seen directly from above, but we need to make sure we do not fall into this trap. This is hardly news. What is more novel about *Pokémon Go's* representation of space is the AR-layer. Bratton has already commented on the use of AR in *Ingress*, an earlier game developed by Niantic (2004), the company that also developed *Pokémon Go*. *Ingress* has a backstory summed up by Bratton (2015, 242) as "a science-fiction alien religious warfare story". That backstory fits perfectly with Bratton's basic concern regarding AR's future: that it is potentially the perfect tool for the communication of a fundamentalist worldview because it does not allow for any space between message and interpretation: "the metaphorical nuance of holy books is collapsed by the direct imprint of virtual words onto real things" (ibid., 242).

On this point, it is fascinating to read Bratton next to Huizinga: In his thesis, the contrast between sacred and profane allows for the emergence of civili-

sation. The magic circle plays an important role in maintaining that contrast. As civilisations mature, however, sacred and profane blur together, a process which is read as decline by Huizinga; commercialised Olympic Games become serious business, the noble arena of the stock exchange is reduced to a playground for rich kids. Bratton's concerns are related to Huizinga's, but Bratton is in a sense updating the sacred-profane problem by framing it with the stack. Where Huizinga is concerned about finding too many elements of one in the other, Bratton warns us against a technology that might not allow us to make any distinction between the two domains. With AR, we are not faced with a perverse mixing of the two but with the sterile literalness of fundamentalist worldviews against which no argument can be made because they do not need to rest on argument in the first place: the facts speak for themselves and the facts are directly accessible via 'The Stack,' as the word "enemy" AR-imprinted on another player of games or "unbeliever" AR-imprinted on all who do not follow the proper faith according to some database.

The Cloud and the Crowd

Pokémon Go is not narratively connected to fundamentalist warfare, but it does come with a geography that would have been impossible without 'The Stack.' When developing *Ingress*, Niantic needed a database of locations. They first turned to the cloud and collected "a data set of public artwork mined from geotagged photos on Google" (Bogle 2016). They then turned to their users for suggestions, received about 15 million and ultimately approved about five million. The most popular locations later became Pokémon gyms with the next most popular becoming Pokéstops. Critical questions could be asked about the selection of places: are churches more interesting (or less inappropriate, or more inappropriate) than mosques, is it more important to draw *Pokémon Go*-players to libraries than to shopping malls, is it more important to highlight a statue than a park? The answer to all such questions could be an oddly convincing exemption from individual, human responsibility: the cloud and the crowd – in short, 'The Stack', of which humanity as a whole is part – has created the geography of *Pokémon Go*.

After delivering his keynote at the International Symposium of Electronic Arts in Hong Kong in May 2016, Bratton was asked why he had titled his book *The Stack* and not *The Matrix*, and *Pokémon Go's* Stack-generated geography does have an oddly non-human, AI flavour to. As news stories about *Pokémon Go* players improperly trespassing on Holocaust memorials and dangerous building sites began to accumulate, journalists seldom tried to reach out to Niantic for comment from the game-designing individuals responsible for such actions. It was as if there was a collective intuition that no human individuals were responsible, that we had all done this by accidentally creating the stack.

What I sometimes find missing from Bratton's discussion of 'The Stack' is a sense of the pleasure that it can bring to find one's way through, or even succumb to, the flows of infrastructures. Inspired by the Virilio's work on acceleration and accidents, Bratton (2015, 233) mentions how the interfaces through which users access 'The Stack' cause stress, and that the very same interfaces "as a therapeutic response […] are asked to soothe the stress […] by presenting their remedy images of orderly resolution as data visualizations, as GUI, as mind maps, as tools and trackers." The idea that inserting oneself in the infrastructural flows of 'The Stack' merely soothes stress seems overly negative to me – and it is probably significant that I speak as someone who spends a lot of time researching games and their players. It is, however, not only in game studies can we find the idea that there are pleasures to be had in succumbing to structures. Although my examples of this will ultimately be drawn from games, it is useful to first take a look at how the notion of structure has developed in architectural discourse. Forty (2000, 276.) identifies three uses of the term "structure," the earliest being "any building in its entirety." Around the second half of the nineteenth century, an alternative meaning was added: "the system of support of a building" (ibid.). During the twentieth century, a third way of using "structure" was added and this is the meaning of the word relevant here, structure as "schema": "A schema through which a drawn project, building, group of buildings, or entire city or region become intelligible. The schema may be identified through any one of a variety of elements […] none of [which] are themselves a 'structure,' only signs that give cause for the perception of 'structure'" (ibid.).

Architecture

Modernist architecture's grand old man, Le Corbusier, exemplifies the trend towards structure in Forty's third sense. When Le Corbusier (2008, 127) turns his attention from the singular dwelling and toward the urban, it is with a focus on and fascination with infrastructure, with "all the organs that up to now have been buried in the ground and inaccessible: water, gas electricity, telephone, pneumatic tubes, sewers, neighbourhood heating, etc." The quote is from the 1923 version of *Toward an Architecture*, in which Le Corbusier tentatively toys with the idea of making infrastructure visible and suggests that the time has come for grand new forms of urban plan. Later, in two books on the *Modulor*-proportional system (1948 and 1955), these ideas have come into full bloom. Describing his largest project, the city of Chandigarh, Le Corbusier (2000, 170) writes about "a cardiac system leading to the door of each of the habitation cells of a sector, but fitting in also with the constituent elements of the city – an urban entity." Just as water and electricity flow in the organs of the city, the movements of the inhabitants will flow according to machine-age plan. This kind of new, rational city plan will generate

not only optimal flows of people, communication, power, etc., but also a kind of pleasurable or even spiritual connectivity in the lives of the inhabitants. Pleasures akin to that sense of connectivity are experienced by those who insert themselves in ludic flows of wandering AI monsters, regenerating resources, transportation opportunities, the regularities of player community activities – either in AR-based games or MMO games.

Pleasurable or not, giving oneself over to the dynamic structures underpinning a world has a totalitarian ring to it. In an illuminating accident, users signing up to *Pokémon Go* via their Google accounts originally granted Niantic full access to their Google Cloud-data, that is, users explicitly allowed the company to read all Gmail, access all Google Drive-documents, look at Google search history and *Google Maps*' navigation history, access private photos stored in Google Photos etc. (Reeve 2016). Although Niantic swiftly gave up the rights it had acquired seemingly unintentionally (Frank 2016), and although most users would probably not agree to paying for their cloud access with that amount of information, the accident can be used to think about how much we would be willing to make available to ensure stack-addressability (would it be alright to share *Google Maps* navigation history, perhaps photos shared in particular folders?) and if there is a point where it becomes suspect to avoid addressability ("nothing to hide, nothing to fear").

Surveillance

Bratton (2015, 192) does acknowledge that a "full-spectrum surveillance society, in which no biochemical misdeed goes unsearchable and unnoticed" is a possible outcome of the accidental design process leading towards 'The Stack.' This is an outcome Raph Koster (2016a) has regularly been warning against since he authored "Declaring the Rights of Players". Most recently, *Pokémon Go*, prompted Koster (2016) to quote the following from that older text:

> Someday there won't be any admins. Someday it's gonna be your bank records and your grocery shopping and your credit report. […] Your avatar profile might be your credit record and your resume and your academic transcript, as well as your XP earned.

The entities that swallow all this information are the cloud empires, "Facebook, Google, and yes now Nintendo, The Pokémon Company, and Niantic [who] as they move into AR [become] basically like governments" (ibid.). They are like governments because they "have access to your private data […] have controls on the economy, […] can [unilaterally] affect real estate values, and […] can set forth rules via commission or omission on how people interact" (ibid.).

Bratton (2015, 119) would agree with all that and even add other examples of the cloud taking over functions, such as cartography, that used to belong exclusively to states, but he would crucially add that the nature of states and governments, the nature of sovereignty itself, is under redefinition in the stack. Corporations taking on new roles previously held by states and states finding new ways to project their power are two outcomes of the same effect: 'The Stack' is becoming the source of sovereignty itself. Bratton's message is that dystopian outcomes is not a given but that 'The Stack,' although so far developed through a series of accidents, can be designed. If nothing else, the dystopian future is simply too easy to imagine, there must be other options, if we can imagine them. It bears repeating that game studies is well positioned to highlight the experiential dimension of that design, its pleasurable dimensions even. Koster (2016) remarks, again in connection with *Pokémon Go* as a precursor of what Bratton would call 'The Stack': "the best qualified people to design this brave new world are game designers, because the social network folks seem clueless about human behavior, the product people only want to sell to them, and the GIS people tend to forget they exist altogether."

Conclusion

Richard Bartle (2004), who famously co-designed the first MUD with Roy Trubshaw in 1978, tried to improve the possibilities of successful way-finding in the MUD by looking to the urban planner Kevin Lynch for advice. It is encouraging to know that such connections between game design and urban planning are made. Lynch talked of a person's sense of environmental image in a way that reminds of, yet is so far from, Bratton's (2015, 91) rather technically worded mention of "the diagrams and visualizations of the networked totality" found on the earth-layer. It is with a very different sense of human warmth Lynch (1960, 4) pronounces that: "A good environmental image gives its possessor an important sense of emotional security. He can establish a harmonious relationship between himself and the world" – How is that for a design brief?

By prioritising the vertical rather than the horizontal, Bratton's six-tiered Stack model of urban space offers game studies new conceptual resources for exploring the connections between contemporary gaming and everyday life. The model has been applied to computer games with special attention to the case of *Pokémon Go*. Computer games offer very clear examples of the mental attitudes associated with 'The Stack'; the sense of total overview and mastery of resources associated with the Earth and Interface layers came out in the use of software add-ons by MMO players. But games also offer clear expression of the ways in which Users become part of the stack on the address-layer, as they need to be addressable by 'The Stack' to play at all. Players physically inserting their *Fallout 4* smartphones into plastic

parts of the game, after digitally preparing them with the *Fallout 4* app, were seen as an expression of users inserting themselves (including their data) in the stack. *Pokémon Go's* reception in China – workarounds used to occupy a highly symbolic shrine in japan, the launch of a Chinese copycat version, *City Elves GO* – has been used to show how 'The Stack' at times extends rather than threatens the logic of traditional state power. Finally, game studies is well situated to complement Bratton's account of 'The Stack' with attention to the experiential and pleasurable dimensions of inserting oneself in infrastructural flows.

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