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# Future Shift for 'Big Things': From Starchitecture via Agritecture to Parkitecture

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**Abstract:** This article analyses three recent shifts in what called the geography of 'Big Things', meaning the contemporary functions and adaptability of modern city centre architecture. We periodise the three styles conventionally into the fashionable 'Starchitecture' of the 1990s, the repurposed 'Agritecture' of the 2000s and the parodising 'Parkitecture' of the 2010s. Starchitecture was the form of new architecture coinciding with the rise of neo-liberalism in its brief era of global urban competitiveness prevalent in the 1990s. After the Great Financial Crash of 2007–2008, the market for high-rise emblems of iconic, thrusting, skyscrapers and giant downtown and suburban shopping malls waned and online shopping and working from home destroyed the main rental values of the CBD. In some illustrious cases, 'Agritecture' caused re-purposed office blocks and other CBD accompaniments to be re-purposed as settings for high-rise urban farming, especially aquaponics and hydroponic horticulture. Now, COVID-19 has further undermined traditional CBD property markets, causing some administrations to decide to bulldoze their 'deadmalls' and replace them with urban prairie landscapes, inviting the designation 'Parkitecture' for the bucolic results. This paper presents an account of these transitions with reference to questions raised by urban cultural scholars such as Jane M. Jacobs and Jean Gottmann to figure out answers in time and space to questions their work poses.

**Keywords:** Big Things; city centre architecture; Starchitecture; Agritecture; Parkitecture



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## 1. Introduction

We shall briefly introduce and contextualise the discussion around the origins and nature of these architectural lineaments and styles. Sequentially, the first that we, akin to others, stylise as 'Starchitecture', was a product of the 1990s and overspilling into the early 2000s, a hedonistic, narcissistic and competitive markets-driven period whereby city administrations favoured iconic architectural statements by 'star' architects as victims of a hubristic urban positioning tactic harmonising with a neoliberal 'survival of the fittest' ideology [1]. The second style under consideration is far less hegemonic but couched in contrarian terms as a first responder tactic trying to answer [2]'s question 'Why the Skyscraper?' This clearly old question has in recent years become complex, because it has even more recently begun to evolve diverse answers. While it could once be 'explained' in terms of cultural phallocentrism, or more technically, economies of scale offered by the exploitation of land rent opportunities, nowadays both responses are facing obsolescence because many skyscrapers have become 'ghostscrapers.' Many began showing signs of emptying before the COVID-19 contagion infected global cities, but after the pandemic struck, many have become redundant as office blocks. In some striking responses to that crisis, some have become agricultural holdings for aquaculture and hydroponic horticulture, giving rise to the generic epithet of 'Agritecture', although this is by no means confined to skyscrapers. Accordingly, the central research question of this study is: *What combinations of adaptive re-purposing will evolve to replace redundant urban sunk investments and uses in the short-to-medium future?*

Moreover, among the diverse answers are 'dwellings', sometimes adorned with high-rise gardens and even micro-forests. This leads conveniently into a speculation about the future of other 'Big Things' than mere skyscrapers, for which the property market has deemed there to be little future use, such as downtown shopping malls because of the acceleration in online retail. These omni-combinant shifts coalescing with the crisis of downtown hotels, restaurants, cafes and bars and related urban hospitality functions caused by 'working from home' (WFH) has sounded the apparent death-knell of many central business districts (CBD). This has elicited urban demolition actions or plans for such 'Big Things' as in Paris, Barcelona, New York, London and Milan to dig up main streets, unused and unrentable retail space such as shopping malls as well as, conceivably, skyscrapers and car parks and convert them into urban parklands, the design and exemplars of which are here parodised as 'Parkitecture'. This paper speculates on the prospects and key design elements of already existing 'Agritecture' and envisioned 'Parkitecture' for the post-COVID-19 urban scene, while puzzling about 'Starchitecture' in an era of 'Big Green Things'. In the research identifying key characteristics of the three actual or imagined urban cityscapes for the future, secondary and a small amount of primary data (following sentence) were gathered from selected and referenced documentary sources such as academic journals, consultants' reports, online sources and technical journalism. In the Guggenheim case, primary interview research with relevant policy actors was conducted by the author.

## 2. The Rise and Demise of 'Starchitecture'

This fashion represented a neoliberal urban policy response to the stagnating fortunes of major cityscapes in decline (e.g., Bilbao), displaying a mediocre urban built form (e.g., Denver), or communicating would-be 'global city' aspirations (e.g., Toronto). This was fuelled by the perceived success of the 'Bilbao effect' caused by the 'starchitecture' of Frank Gehry's Guggenheim museum design. Starchitecture can immediately be categorised psychologically under the 'narcissism' label. This is one of the 'dark triad' of personality traits in humans, alongside Machiavellianism and psychopathy (and lately the 'dark tetrad', including sadistic callousness; [3]) that together signify cynical, paranoiac, misanthropic, and immoral beliefs; emotional detachment; self-serving motives; manipulation and exploitation, impulsivity, ingratitude, and a lack of guilt, mortification or remorse for harming others, now also 'callousness'. Psychologically, narcissism is a recognised and defined human trait that expresses an inflated ego, control-freakery, vanity, and 'hubris', while being admired and acknowledged by others. The 'stars' are likely to display at least some of these traits, either as aspirational or confirmed celebrity architects; internationally famous or soon to be, attention-grabbing, and insouciant to context, verging on imperiousness. As well as referring to the buildings and practitioners, starchitecture has had its correlate in city jurisdictions, urban stakeholders and city boosters who saw it as a 'creative' approach to 'positioning' their city at a distance from blandness or competitive mediocrity. They thus habitually created urban 'media events' on Instagram to counter the feared 'nonentities' brand. As a casebook exemplar, [4] took 'Denver as an ideal case to study because of its banality—its exceptional unexceptionalism'. Part of its strategy to build urban identity beyond its regenerated downtown 'cultural' historic district of Larimer Square and further attract international tourists, Denver thus had three of its new CBD cultural schemes constructed by starchitects; Daniel Libeskind for the Denver Art Museum, Michael Graves for the Central Public Library, and the Museum of Contemporary Art designed by Ghanaian star David Adjaye, responsible for the National Museum of African American History and Culture, Washington DC, amongst others. Yet, the least 'starry' of the four is the Clyfford Still Museum—the eponymous artist disliked the art dealer business and remained a contrarian even in his later life. Although a pioneer of his highly saleable abstract expressionist works, Still sought to maintain control of his works for the public and especially for art education by the Museum after his death. Accordingly, the relatively unknown partnership

of Allied Works based in Portland, Oregon and the Museum's designer Brad Cloepfil were chosen once Denver agreed to the artist's conditions.

A significantly different set of motivations underpinned the desire of Bilbao to initiate what came to be called 'the Bilbao effect' that initiated the 'starchitect' movement in the 1990s. First, its economy was in serious decline following closure of the Euskalduna shipyard on the banks of the River Nervión. This in turn created further deindustrialisation fears for the other main industry in the city, which was steelmaking at the Altos Hornos steelworks, which actually closed some ten years after the shipyard. This caused the city, its remaining oligarchs from the days when Bilbao was one of the two (with Barcelona) main economic motors of the Spanish economy, representatives of the provincial (Vizcaya), regional (Basque Country) and EU governments, and BBVA Bank to then agree to meet the Guggenheim Foundation's terms. When I interviewed a sample of these actors about how they embarked upon a new 'Post-industrial Planning Strategy' in the mid-1990s and successfully attracted 'starchitect' Frank Gehry to design its proposed Guggenheim Museum, it was the 'hubris of history' that emerged from numerous interviews with the leading 'Deconstructivist'. A common response was that the oligarchy, many of whom or their descendants still lived in Algorta, the pleasant seaside suburb near the mouth of the Nervión, were still rich and had always invested in the highest quality buildings, equipment, accommodation and cuisine. Bear in mind that persuading a famous but comparatively inexperienced museum 'franchising' foundation to lend its name and its valuable inventory to a grimy, de-industrialising port-city was at the time considered challenging to the Foundation, if not the stakeholders.

Hitherto, the Guggenheim Modern Art portfolio consisted mostly of Solomon R. Guggenheim's niece Peggy Guggenheim's former residence on Venice's Grand Canal at Palazzo Venier dei Leoni, and the Frank Lloyd Wright-designed Solomon R. Guggenheim Museum on New York City's Fifth Avenue that opened in 1959. The Basque government agreed to cover the USD 100 million construction cost, to create a USD 50 million acquisitions fund, to pay a one-time USD 20 million fee to the Guggenheim Foundation and to subsidize the museum's USD 12 million annual budget. Amid an outside light show and concerts, the Bilbao Guggenheim was opened by the King of Spain on 18 October 1997, with Frank Gehry as its Canadian/US 'star' architect. Scale and space were the guiding motives inside the building while the exterior should appear as a 'dream ship' clad in shiny titanium. Accordingly, some of the largest installations in the world could be housed there; Anselm Kiefer's enormous paintings could be housed multiple times. and the entrance was occupied by Richard Serra's monumental ship-grade steel 'curved corridor' called 'The Matter of Time'. Outside the entrance since the opening has sat an equally monumental horticultural (Begonias, Busy Lizzies, Pansies) puppy designed as a 'guard dog' by Jeff Koons. According to Museum data, the museum attracted over 20 million visits, created 5000 jobs and generated EUR 650 million in its first twenty years [5,6]. Few 'starchitect' schemes have replicated such indicators; notably, Calatrava's 'City of Arts & Sciences' in Valencia overshot its EUR 300 million budget by EUR 1 billion, which still affects the regional budget today. Finally, many of Guggenheim's efforts to repeat the 'Bilbao Effect', from SoHo and Las Vegas to Berlin, Helsinki and Vilnius, became stalled or shuttered.

Notable in Bilbao's relative success 'effect' was the related variety of its post-industrial commitment. Figure 1 shows its first achievement in the Guggenheim, Euskalduna accompanied by the transformation of its 'Steel and Shipbuilding' riverine image after the opening in 2010 of the Norman Foster underground rail system with its popular 'Fosteritos' portals, the Calatrava Millennium Bridge, Cesar Pelli's Iberdrola Tower at Abandoibarra and Philippe Starck's Azkuna Zentroa Cultural Centre (2011). However, the Zaha Hadid proposal for Zorrozaurre more than a dozen years ago, including another bank tower, this time for BBK, remains one of 30 of the partnership's unrealized redevelopment plans which were projected to revitalize an underutilized peninsula on the Nervión River in Bilbao's port area [7]. Meanwhile, the Robert Stern Zubiarte retail mall was built on the banks of the Nervión and opened in 2015. Stern was one of 'starchitects' critic Christopher Jencks

labelled as 'paper architects', whose designs were also often unbuilt and unbuildable. Moreover, the late Ricardo Legoretta, from Mexico, whose style was influenced by the Basque master sculptor and architect Eduardo Chillida, completed his Melia Bilbao Hotel nearby in 2005.


**Figure 1.** Bilbao's portfolio of starchitect projects. Source: Author graphic.

Toronto's starchitect motivations were less desperate than Bilbao's successful post-industrial strategy that combined infrastructural, architectural and hospitality investment in an integrated, yet-to-be-completed consumption envisioning, but also less needy than Denver's successful arrival on the map of urban cultural-creative spectacle. Toronto had become important as the national financial leader of Canada, displacing Montreal as the latter pursued a leadership role in the mid-twentieth-century political campaign in support of independence for Quebec. The flight of financial HQs long-settled in Montreal ensued much as night leads to day. However, following a period of absorption of the banks and bankers, with their housing growth, enhanced salaries and Francophone consumption demands, Toronto's planners began to recognise that their city remained culturally Anglophone with a culinary and creative offer to match. In 2020, Toronto received its greatest disappointment, when Google's Thomas Heatherwick-designed plan for a harbourside 'smart neighbourhood' on twelve acres of waterside development by parent corporation Alphabet subsidiary Sidewalk Labs decided to shelve its Quayside project. This was for three reasons: first, Google wanted ten times more space, of which the city government disapproved; second, it wanted to build a city, as CEO Dan Doctoroff said, 'from the Internet up'. Predictably, the deeper aim was to harvest visitor identities to sell to 'attention' advertisers without adhering to Canadian privacy laws; and third, it claimed the coronavirus had holed the proposed development below the waterline [8]. Nevertheless, Toronto's established history of approving iconic architecture projects, going back to Frank Gehry's early project for the Art Gallery of Ontario (2004), Will Alsop's Ontario College of Art & Design (2004) and Gehry's later extension of AGO (2008) continues, with big approvals for 3XN's and Barney Ingels Group (BIG) partnership's condominium designs recently being approved and under construction (Figure 2). Ziggurats characterised the failed Quayside development, albeit clearly remaining fashionable for Bjarne Ingels' BIG

and 3XN compared to the preceding more Cuboid and subsequent swirling forms Zaha Hadid era. However, perhaps the 'apotheosis of angular' is expressed in the celebrated internationally renowned 'Deconstructivist' architect Daniel Libeskind, after whom another art gallery and museum extension, the Royal Ontario Museum (ROM), was opened in 2007 (Figure 3).


**Figure 2.** Projected (Top) and Existing Starchitecture in Toronto.

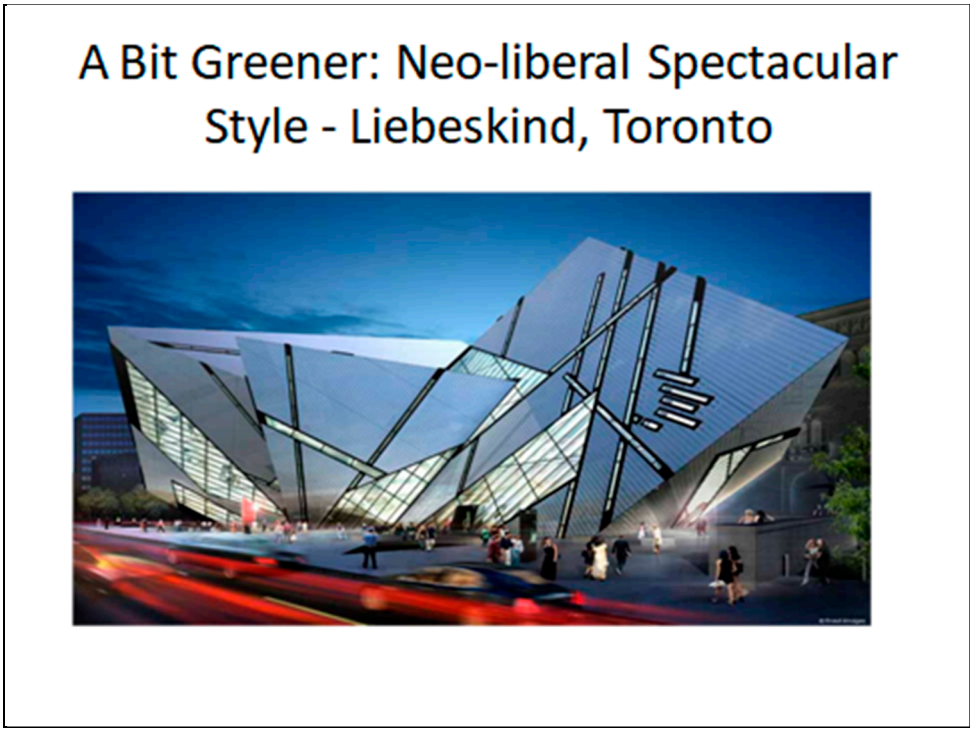


**Figure 3.** Daniel Libeskind 'Deconstructivist' Royal Ontario Museum Extension 2007. Source: ROM.

Despite appearances, the Libeskind design was relatively sustainable in nature. As Cooke [9] noted, these elements were included:

'because Toronto had at the time a 'green' Mayor and city administration, the building is designed to the highest principles of sustainability. Thus it had a planted roof for insulation and relaxation; the building is double clad for high-grade insulation, with local Hamilton, Ontario, albeit energy-intensive, stainless steel framing, and maximum use of natural light. However, Liebeskind has taken criticism for not demonstrating more overtly green credentials in ROM'.

Accordingly, within the building's *Crystal* portal, it was reported that the roof had suffered from significant water leakage, causing concerns for the building's resilience to winter weather. Although a two-layer cladding system was incorporated into the design of the Crystal to prevent the formation of dangerous snow loads on the structure, past architectural creations of Daniel Libeskind (including the Denver Art Museum) had also suffered from weather-related complications. So, it must be concluded that this neo-liberal 'starchitect' did not adhere to the highest 'green design aesthetics' at that time. Thus, we may conclude this sub-section with an elegiac note. The neoliberal injunction to reflect and express competitive urban vanity through narcissistic traits could disappoint, owing to its architectural over-ambition. This partly fulfilled the criticism that 'starchitecture' often remained 'unbuilt or even unbuildable', and when built sometimes proved flawed or fallible and seldom prioritised sustainability or green principles in its design aesthetic.

## 3. From Starchitecture to Agritecture: Canada Steps up Again?

If Toronto, even for its large population size (6 million for the metro area; 3 million for the city) was once, if not bland, then not quite blossoming, its penchant for attracting starchitects has remained a firm desire, despite occasional disappointments. Nevertheless, all that high-rise financial and commercial office building since the 1980s and 1990s has occasioned some problems with oversupply in the recent and ongoing current situation after the COVID-19 hiatus. As we have conjectured, there has been, as in every main Western financial and commercial CBD and even subsidiary SBDs, a growing penchant among employees and even more so among employers than might have been expected in favour of cutting out daily commutes, avoiding downtown pollution overload, reducing mobility anxiety and securing work–life re-balancing by increasingly working from home (WFH). This has—temporarily, or perhaps for longer than once thought credible—created ghost centres, bereft of commuters, shoppers and other visitors and causing reappraisal by property developers, city managers and bewildered downtown visitors regarding what to do. Some sunk investments built by 'starchitects' are relatively immune, since those in the key parts of the creative sector, such as museums and art galleries, are unlikely to be denuded of determined 'day-out' visitors, but other sectors such as cinemas, theatres, live music venues, nightclubs, hospitality and premium culinary destinations are largely unable to function under coronavirus conditions and their likely aftermath. Even when the pandemic is brought under some viable means of managed control and in the absence of recurrences either of COVID-19 or, worse, some complex new variant or novel virus, re-use can be inferred. Especially in the voided space of the more vintage point-blocks and tired arcades, shopping centres or early retail malls, various forms of repurposing will be due. This is if they are not to feature on deadmall.com, with miasma fogs traversing abandoned food courts and frogs spawning in the fountains, as observed at Akron's 1975-opening Rolling Acres 1975, photographed in 2019 by urban explorers. Re-purposing by Amazon to turn the site into a massive 'fulfilment centre' after a decade was finally announced [10] as the first of two such rustbelt regeneration projects, the other being in Toledo. Clearly, such 'robotic' fulfilment centres would scarcely re-populate the sites but rather automatically pick, pack and ship small items to customers, such as books, electronics and toys.

In Canada, the use of such spaces is being made by inventing and investing in 'agritecture' in older modernist edifices. What is agritecture? Agritecture concerns applying architectural thinking when designing agriculture for the built environment. It involves

integrating the disciplines of agriculture and architecture to facilitate building use or re-use for growing food. *Agritecture* is a web journal which has provided news on urban agriculture, vertical farming, greenhouses, and local food systems since 2011. Meanwhile, its *Vertical Farming Academy* educates ways in which agritecture can operate within any building (indoor vertical farming) to maximize the density of growing or without it (living walls and rooftop farms). This allows advantages of urban microclimates to be realised in or outside of city buildings [11]. Accordingly, it challenges the hegemony of industrial scale agriculture by promoting food production in urban, local and neighbourhood environments. Vertical farming involves growing crops in vertically stacked layers in empty spaces and rooms inside high-rise buildings, shipping containers, tunnels and usable, albeit abandoned plant. Such farming is usually aimed at optimising productivity using soilless or low-water absorbent farming by techniques such as hydroponics, aquaponics and aeroponics. In combination with the use of LED lights, agritecture can achieve yields of ten times those of conventional cropping. Energy sources and use would be expected to be renewable and organic, although without free infrastructure costs (e.g., abandonment), it can be more expensive than, for example, greenhouse production. Conversely, it is not weather-prone, does not require fallowing and has no chemical fertilizer costs. Accordingly, no ecosystem disruption occurs.

When Toronto began to attract Montreal's financial centre as an effect of Quebec's rising demand for independence in the 1970s–1980s, the city's economy was simultaneously suffering the effects of the oil embargo and related uncertainties. As elsewhere, a move to respond by experimenting with domestic and community self-sufficiency was realised in Montreal accompanied by a public and private fascination with urban agricultural solutions. This was expressed in early attempts at a short-lived community gardens programme which began as early as 1972. A year later, a further initiative arose from a McGill University architecture programme which entailed the construction of rooftop greenhouse farming from cheap, recycled materials. A related initiative was named the Rooftop Wasteland experiment. Vertical gardens were first re-purposed when Pierre Bourque was made the Director of Montreal Botanical Garden in 1979.

By 2011, McGill University's Edible Campus (Figure 4), begun in 2007, had shown that agritecture could involve volunteer citizens from various backgrounds in creating, cultivating, harvesting, and maintaining a productive community space. During the growing season, this garden produced over one tonne of fresh organic produce for the *Santropol Roulant*'s (Meals on Wheels) programme that supplied food to 100 Montréalers on a daily basis. Additionally, in 2007 (small), containerization farming gained momentum from McGill projects evolving from Montréal's Urban Gardens programme (Figure 4). These use semi-hydroponics, supported by training courses on container-based organic gardening. This success led to the Rooftop Wilderness (formerly Wasteland) practice involving gardens being designed on top of urban expressways, public buildings and hotels where two commercial firms—Lula Farms and Fairmount Hotels—service chefs gardens that are now common in hotels in the city [12].

The stimulus of Montréal's historical development of urban agriculture in the 1970s influenced more top-down practice in Toronto for some time afterwards [13]. In 2009, Toronto instituted its first Green Roof By-law, whereby all new buildings (commercial, residential, institutional) had to have a green roof once they were over a specific size. Industrial buildings were added to the list in 2012. In Figure 5, this contribution shows an innovative vertical farm in downtown Toronto, repurposed from a military tank warehouse. The firm *We the Roots* was a 2017 spinout from nearby Guelph University's Controlled Environment Systems Research Facility whose Space and Advanced Life Support System project researched food cultivation in hostile environments, e.g., without an atmosphere, as on Mars, using complex hydroponics and LED lighting. The company grows top-end herbs, salad greens, rucola and kale for five Toronto restaurants. Hitherto, Californian suppliers took four days to deliver while the firm takes less than four hours for shipment. Quality-to-cost innovation has expanded LED luminescence tenfold in twenty years. Meanwhile

customised LED bulbs are priced at 20 cents compared to CAD 8 previously. Accordingly, what were high energy costs have disappeared from such agritecture settings. Similarly, inspired by a future market for food-in-space, *Elevate Farms* practised high-tech food cultivation indoors that nowadays saves energy and aims at improving food security and safety [13] reported that Ontario's Greenbelt Foundation identified vertical farming as a priority to expand fruit and vegetable growth in the region and listed six vertical farms operating in Ontario (not including *Elevate Farms*): one in Kingsville, two in Guelph, and three in Toronto. The *McCain Foods Corporation* in 2021 announced that it had invested USD 50 million in the hydroponics vertical farm *TruLeaf* alongside its *McCain* subsidiary *GoodLeaf* already in Guelph. All grow leafy greens, herbs, and microgreens (such as kale). Elevate's premises uses 450 sq. m as a growing space from an 1860 sq. m. facility on an industrial estate. Plants are stacked 13 layers high (about 7.5 m) and grow with their roots in water, rather than soil. The aim is to grow 454,000 kilos per year from an overall 3000-square meter box. On the downside, most current cultivation involves growing lettuce or some variation on a salad green that has marginal nutritional value. Other popular produce, such as fruits and legumes, take more time to grow and require more nutrition. It is perceived that that artificial intelligence (AI) should bring a step-change for vertical farms, allowing growers to work more efficiently and precisely, thereby opening up more horticultural possibilities. As a case in point, yet another salad green business, *Uplift*, used PlantKeeper, a proprietary indoor farming management system, to control and monitor environmental factors so that farm operators can be updated with real-time growing conditions throughout the farm. By using simple and proven robotics and conveyor systems, *Uplift* automated seeding, transplanting, harvesting, plant transporting and system cleaning, reducing labour intensity to its lowest possible level [14].

**Figure 4.** McGill University School of Architecture's Edible Campus Before and After Cultivation. (Source: [12]).

**Figure 5.** *We the Roots* vertical farm in Toronto. The farm is located inside an adaptively reused Second World War warehouse in the city centre. (Source: N. Cyprys).

Finally, it is worth bearing in mind that, while vertical farms have been planned, as shown in Figure 6, they are outweighed, unsurprisingly, by low rise and even rooftop gardens. The oversold idea of Toronto's ambitious *Skyfarm* 58-storey Agritower designed by architect Gordon Graff remains at proposal-only stage, as indeed do most registered in the first decades of this century. Figure 6 updates Pyramid Farm guru Dickson Despommier's now dated effort which, nevertheless, includes then actually existing vertical farms [15]. These include: South Korea's three-storey 'grow lights' facility; Japan's Kyoto 50+ *Nuvege* peri-domestic 'half-lights/half-sunlight' units; Singapore's *Sky Greens* four-storey sunlight-fuelled facility; Chicago's *The Plant* three-storey 'grow lights' plant; Chicago's *FarmedHere* 'grow lights' unit; and Vancouver's four-storey *Alterrus* 'sunlight' building (bankrupted in 2014). Some of the above are shown in Figure 6.

So, it is clear from the above data that the early history of vertical farming was particularly fraught the higher the facility selected to house the agricultural holding in question rose above ground level. Notably, rooftop gardens, of which there are many more commercial versions than listed in the data supplied, have a good record, but not as impressive as low-rise holdings, such as in the case of Kyoto, with over 50 units. On the other hand, recent legislation, energy cost declines and technological change have seen numerous concentrations occurring in Toronto and other large cities very recently. Hence, learning gains have enabled access to investment finance for industrial units capable of housing 7–10 m cultivation stacks. Developments in current or repurposed older accommodation in industrial zones are more common than high-rise, if still sporadic. An example of another unheralded Toronto success has been the *Ripple Farms* start-up that specialises in aquaponics in an adaptively re-used shipping container at the former Evergreen Brickworks [16].

| Summary of Projects: Vertical Farm | Location | Type Low Rise , Roof Top or High Rise | Status Built or Not Built |
|---|---|---|---|
| Nuvege | Japan, Kyoto | LR | Built |
| PlantLab | Den Bosch, NL | LR | Built |
| Sky Greens | Singapore | LR | Built |
| Green Spirit Fms. | Michigan, USA | LR | Built |
| FarmedHere | Illinois, USA | LR | Built |
| The Plant | Chicago, USA | LR | Built |
| Green Girls Prod. | Memphis, USA | LR | Built |
| Brooklyn Grange | Brooklyn, USA | RT | Built |
| Gotham Greens | Brooklyn, USA | RT | Built |
| Plantagon | Stockholm, SW | HR | Defunct 2019 |
| La Tour Vivante | Rennes, France | HR | Proposed 2005 |
| Harvest Green Tr | Vancouver, CAN | HR | Unbuilt |
| Skyfarm | Toronto, ON | HR | Unbuilt |
| Pyramid Farm | New York C. USA | HR | Unbuilt |
| TBD | Philippines | HR | Unbuilt |

**Figure 6.** Low-rise, rooftop and high-rise vertical farming commercial facilities. (Source: [11]).

To round off this sub-section, we remain in Canada and explore Vancouver's experiences of vertical farming, or even low-rise examples, since, as we have seen, Vancouver's *Alterrus* high rise effort suffered early bankruptcy only two years' after its founding in 2014. Accordingly, the City of Vancouver was substantially indebted as a consequence of its investment. We begin in Vancouver partly because it has possibly more vertical farming equipment firms than actual farms. Hence, we begin with the actually existing *Valcent Products*, the innovator of the *Verticrop* hydroponic innovative system using a technology derivative of vertical farming and operating fully functionally. The system involves multi-level stacked plastic trays in a climate-controlled glasshouse enclosure (rather than multiple floors). The firm claims its vertical hydroponic farming technology can produce over an area of one standard residential lot (50 by 75 feet) the equivalent output of a 16-acre farm [17]. However, following that account, east Vancouver's first vertical farm—*Local Garden*—announced bankruptcy in May 2017, five years after being announced as North America's first *Verticrop* farm. Moreover, aeroponic, closed-loop *Harvest Urban Farms* deployed high-tech *Valoya* LED lighting, but it failed to save the firm from bankruptcy. Vancouver Urban Farming Society data show that the city went from 15 farms in 2013 to nine in 2019, and since updated the current number of farms to eight, after another was shuttered in 2020 [18]. The tally stands in stark contrast to the goals laid out in Vancouver's 'Greenest City Action Plan', which aimed to reach 35 urban farms by 2020. There seem to be multiple teething troubles with liberal-seeming new by-laws enabling changes in downtown land use to urban farming. However, such by-laws are, ironically, claimed to be 'bureaucratic', while costs of repurposing urban farm requirements in the city centre and associated infrastructure costs for hydroponics and such like are excessive. Finally, nearly every Vancouver vertical farmer, and many others, while pursuing local market freshness and delivery, is in exactly the same over-specialised market niche, selling salads and leafy greens that nutritionists report are not particularly nourishing. Accordingly, it is one thing to have diversification down the supply network to local growers, but according to [18], they find the city centre uneconomic. So, some have either been encouraged by the city to move out to cheaper, post-industrial premises elsewhere, or to move out to more rural settings in British Columbia. Finally, of eight kinds of urban farming listed by [19], only two, namely 'Expansive urban agriculture (including backyard and rooftop farming)' and possibly 'Covered urban agriculture (greenhouses and rooftops)', have been deemed likely

to thrive in city centres. Those that may still appear possible candidates for exponential growth due to economic drivers would, as we have noted, probably gravitate towards the fringes of cities and thus constitute forms of peri-urban, rather than urban, agriculture.

## 4. After Over-Specialisation in Vertical Salad Greens, Can Parkitecture Save City Abandonment?

Despite the rather downbeat assessment of the prospects for vertical farming based on our selected cases from progressive and apparently forward-thinking, sustainability-informed city administrations in Canada, it fits a 'pattern recognition' interpretation of a likely scenario for abandoned zones. Such are parts of cities hitherto traditionally populated with retail malls, office villages and skyscrapers that some see as candidates for a revived urban agriculture. The first pattern element is that—unsurprisingly—although land rents charged by property developers have been forced down by failing retail chains, they nevertheless remain extortionately high compared with agricultural land values. Quite why this might have escaped the notice of urban pioneers and sympathetic city administrations is rather difficult to understand. Not least, the penny should have dropped when many cities in, for example, the UK, confronted with swingeing cuts in their budgets from austerity anxiety imposed by global finance upon a willing central state administration, spent irresponsibly to buy uneconomic shopping malls. This was in the unfounded belief that municipal budget cuts could be indemnified by becoming retail landlords. Such wishful thinking resulted in at least twenty cases of egregious loss of local financial control as reported below:

'. . . Properties bought by councils include a BP business park in Sunbury purchased by Spelthorne for £392 million; a Tesco Extra bought for £38.8 million by East Hampshire District Council; branches of Waitrose and Travelodge acquired by Runnymede District Council for £21.7 million and a B&Q store that is now owned by Dover District Council. Other acquisitions range from farmland and gyms to a Royal Mail depot and a solar farm. Surrey County Council has spent £70 million on a shopping centre in Worcestershire, while Torbay Council in Devon has purchased a distribution warehouse 230 miles away in Medway, Kent. Broxbourne Council in Hertfordshire meanwhile, has spent £17 million on a site occupied by Tesco 170 miles away in Grimsby. Surrey Council records show that 80% of its investments have been made outside the county. In April, Isle of Wight Council forked out £11 million on an industrial estate in Salford Quays, Manchester, two months after the seller invited offers of £8.7m. Devon has purchased a distribution warehouse 230 miles away in Medway, Kent' [20].

Below, in Figure 7 is shown the kind of empty office block purchased by Spelthorne in Reading, which might easily have been a candidate for vertical farming in a different universe. In the UK, it remained empty, but with a notional value entered in the audited municipal assets account. Accordingly, Thames Tower in Reading was one of the properties bought by Spelthorne council as part of a GBP 285 million deal in August 2018. By 2021, another UK council had voted to demolish the town centre it had previously purchased for GBP 14 million in 2019. This is the 'pioneering' shopping centre that will be demolished in 2022 to make way for a twenty-thousand square meter park with forestry, sculpture and other art installations. Vacancy rates in the town had risen to three times the UK average, influenced by online consumer retail and a surplus of retail units in need of repair or too large to make a substantial profit. The onset of COVID-19 further contributed to the plight of Stockton's high street, as experienced by many others throughout the UK. Figure 8 indicates the scale and composition of the proposed Riverside Park and associated installations planned for the former Castlegate Shopping Centre. Designed by convicted architect John Poulson, the Castlegate opened in 1972.

**Figure 7.** Thames Tower Reading, purchased by Spelthorne council as part of a £285 million deal in August 2018. (Source: A. Stagg/Alamy).

**Figure 8.** Proposed plan for Riverside Park, Stockton-on-Tees, UK. (Source: Stockton Council).

Poulson was embroiled in a massive corruption scandal by 1973 and jailed in 1974. The proposed Riverside Parkland scheme's design partnership was local firm Ryder Architecture, whose founders, Gordon Ryder and Peter Yates, were disciples of, and also worked with, Le Corbusier and Ove Arup, but first met in the office of Berthold Lubetkin. A Soviet émigré born in Georgia, Lubetkin had arrived in London in 1931 after time spent in Berlin, Warsaw and Paris. In 1932, he set up the radical architectural partnership *Tecton* in London with others including Denys Lasdun and other leaders of CIAM and the Modern Movement. Lubetkin met Arup in 1933 when he was referred to Newcastle-born Arup's employer in connection with the project he was working on, the iconic London Zoo Gorilla House, and later together on its equally iconic Penguin Pool (Figure 9). Arup later became

consulting engineer to other leading modernists such as Wells Coates, Maxwell Fry and Erno Goldfinger.

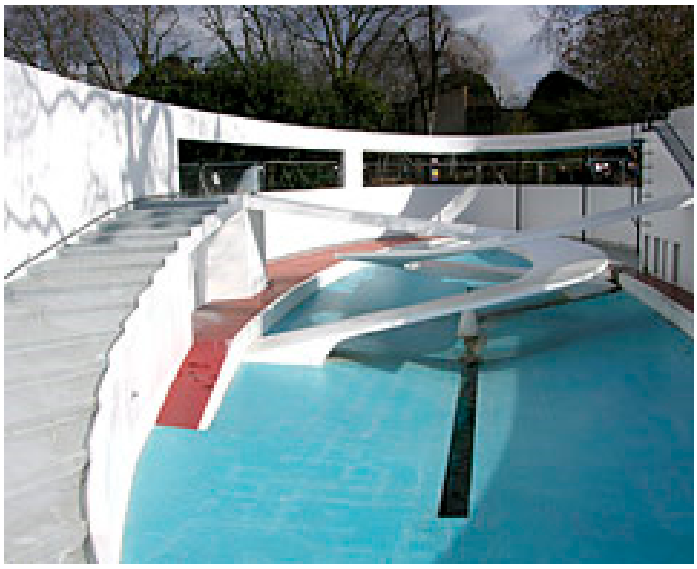

**Figure 9.** The Lubetkin Penguin Pool at London Zoo. (Source: Tecton).

Riverside marks a return to Modernism's first principles after the more Brutalist concrete associated with the Poulson era.

Moving on, the narrative of the final parts of this sub-section consists of three main vignettes revealing design thinking about visible problems of city centres suffering retail and office abandonment, pollution from noxious energy and mobility sources, particularly oil-reliant vehicles and domestic wood-burning stoves, and 'overtourism'. This is prevalent in signature destination cities such as Paris, London and Milan and cultural cities such as Venice, Florence and Barcelona. What each of these diverse cities has in common is the will to de-congest, clean-up or make their environment healthier by replacing polluting mobility sources with landscaped, natural, and even wild central city parkland. The first comprehensive plan to achieve this for the core of a major destination city is that announced in 2021 for Paris. This plan is led by Paris Mayor Anne Hidalgo with architect Philippe Chiambaretta, who announced the council's approval that the centre of the city from Place Concorde through Champs Élysées to the Champ de Mars beneath the Eiffel Tower was to become an 'extraordinary park at the heart of Paris'. This would return Grenelle, as the 'Mars Field' was once known, closer to its original use for market gardening. Despite its modest fertility, citizen allotments were cultivated with fruit, vegetables and flowers for the local market. Later, it became a military parade ground and site of an artificial mountain topped by 'a tree of liberty', as designed by artist J-L David for the Revolutionary 'Festival of the Supreme Being', before hosting five Grand Expositions from 1867 to 1937, with the Eiffel Tower built as the entrance to the 1889 World's Fair. The French 'Sun King' decreed the construction of the Champs Élysées and commissioned the celebrated royal gardener André Le Nôtre to transform marshy land also used for vegetable gardens into an extension of the Tuileries gardens leading from his palace at today's Louvre Museum. It connects with the Place de la Concorde through existing parkland at the 'Beaux Arts' Large, Small and Discovery Palaces. Despite the tourist guide eulogies stressing the area's luxury retail offer, including top car showrooms on the Champs Élysées, Anne Hidalgo's architect Chiambaretta's judgement was that it needed to be 'ecological, desirable and exclusive', not suffering ongoing problems of 'pollution, the place of the car, tourism and consumerism' [21]. These plans are to be implemented following the Olympic Games, scheduled for 2024. Further plans also apply to the Trocadéro-Eiffel Tower road being turned into a garden, landscaping the Montparnasse Tower and the Notre-Dame Cathedral.

Public consultation over what should be done with the avenue occurred at the council's 'Comité Champs Élysée' invitation. Accordingly, the 10-year plans include reducing space for vehicles by half, turning roads into pedestrian and green areas, and creating tunnels of trees to improve air quality. This complements the *Jardin des Plantes* that was refurbished in central Paris near Gare d'Austerlitz on the Left Bank of the Seine in 1993.

It is notable that adding to urban parkland to control car pollution is recent experimental practice from Utrecht to Vienna, where urban villages are planned for between 4000 and 12,000 inner-city residents, influenced by Anne Hidalgo's 'City of Light' policy idea of the 'Fifteen Minute City' [22], or revived 'Quarters' [23], where residents can limit distant travel from their newly sustainable communities. The location of the new superblock near Vienna's main railway station offers optimal connections to the public transport network via rapid transit and underground railway. The Vienna Aspangründe master plan was prepared by Austrian Real Estate, SUPERBLOCK Architect Office and developed together with Yewo Landscapes, an Austrian office specialised in landscape planning. The 'Superblock' concept originated in Barcelona from the Catalan architect Ildefons Cerdà, designer of its nineteenth century *Eixample* city extension (Figure 10). The original superblocks are now being repurposed as *Superilles* comprising nine city blocks, or *illes*, in which the internal traffic flows have been altered to disallow through-traffic, with speed limits on internal roads reduced. Today, Barcelona is 'greening' its *superilles* at the behest of its in-house parks and gardens agency with wildflower meadows, new parkland surrounding the Sagrada Familia cathedral, and horticultural pavement grill-rings beneath its trees in its *Alcorques Vivos* scheme [24]. A recent study of the health, wellbeing and pollution-reduction gain of Barcelona's greening plan estimated that its implementation of the effects upon the 503 'superblocks' in the comprehensive plan could prevent 667 premature deaths annually. Additional gains could be expected from the plan's economic impact of EUR 1.7 billion, with average gains in life expectancy of almost 200 days due to reductions in harmful urban pollutants [25].

**Figure 10.** Nine street blocks in Barcelona's Eixample quarter will make up a 'superblock' in the city's new green strategy. (Source: Alamy).

Another architect advocating for the conservation of heritage cityscapes and abandoned villages by repurposing empty buildings is Stefano Boeri, who, in contrast to

Chiambaretta's lateral perspective, envisages and designs 'Bosco Verticale' or the 'Vertical Forest' as a prototype building for a new format of architectural biodiversity. This focuses not only on human beings but also on the relationship between humans and other living species. The first example, built in Milan in the Porta Nuova area, consists of two towers that are, respectively, 80 and 112 m high, housing a total of 800 trees, 15,000 perennials and ground covering plants and 5000 shrubs. These provide an amount of vegetation equivalent to 30,000 square meters of woodland and undergrowth, concentrated in 3000 square meters of urban surface. This 'green curtain' regulates humidity, produces oxygen and absorbs $CO_2$ and microparticles. The towers typically display large, ziggurat balconies, designed to accommodate outside containers and allow the growth of larger trees for up to three floors of each building. The towers are serviced by a team of 'Flying Gardeners', a specialised team of arborist-climbers who, using mountaineering techniques, descend from the roof of the buildings once a year to carry out pruning and annual maintenance. Some 1600 specimens of birds and butterflies have been observed in the resulting habitat. Since this achievement, Boeri has also championed the process whereby Italian hilltop village mayors have sold abandoned village dwellings for as little as EUR 1 to city dwellers who now prefer working from home (WFH) while enjoying fresh air and cheap property, which is as better than uncontrolled new construction in heritage terms [26]. Finally, among destination cities, London has recently announced the repurposing of the Camden Highline railway as a limited copy of New York's High Line, which transformed a disused railway into an overground pedestrian parkway planted prairie-style as designed by the Jacob Corner partnership with landscape gardener Piet Oudolf (Figure 11). Dutch plantsman Piet Oudolf is considered the most influential garden designer of the past 25 years, admired for the peace and tranquillity of his 'dream landscapes' of soft grasses and four-season garden beds.

**Figure 11.** Piet Oudolf's High Line garden parkway in downtown New York City. (Source: Rick Darke).

Finally, in brief recollection of Robespierre's artificial mountain topped by 'a tree of liberty' as designed by artist J-L David for the Revolutionary 'Festival of the Supreme Being' on Champs de Mars in 1794, we turn to London's plan, designed by Dutch firm MVRDV for an artificial hill to be built alongside the Marble Arch. This is an attempt to persuade absent shoppers to return to London's once-premier shopping attraction Oxford Street. It

is intended as a 25 m high viewpoint planned to open on 21 July 2021 opposite London's miniature Arc de Triomphe. It will be constructed using scaffolding, which will form a hollow base upon which layers of plywood and soil will then be laid. The soil will be used to grow grass across the structure, while also holding large planters that will be filled with trees. Once complete, it will resemble MVRDV's abandoned proposal for the 2004 Serpentine Pavilion in Hyde Park, which was designed as an artificial mountain around the Serpentine Gallery but never realised due to costs. Since the Serpentine Gallery's pavilion programme began in 2000, the gallery has built a temporary new structure on its lawn in Kensington Gardens every year except 2004. Each pavilion is completed within six months and is situated on the Gallery's lawn for three months for public approbation of designers who never before received UK commissions. Starchitects accepted include Zaha Hadid, Daniel Libeskind, Toyo Ito, Oscar Niemeyer, Rem Koolhas, Olafur Eliasson, Frank Gehry, SANAA, Jean Nouvel, Piet Oudolf, Ai Weiwei, Herzog and De Meuron, and Bjarke Ingels. This listing takes our journey from 'Starchitecture' right through 'Agritecture' to finally reaching 'Parkitecture' in a concept from complexity theory known as 'Strange Attractors'. A strange attractor is a mathematical field in dynamical systems, which after any of various numbers of iterations will lead to points that are arbitrarily far apart. However, some—such as Olafur Eliasson and Piet Oudolf, both involved in designing the High Line—after various other numbers of iterations can lead to points that are arbitrarily close together. Thus, a dynamic system with a chaotic attractor is locally unstable yet globally stable. For, as [27] wrote: " . . . By its nature, the metropolis provides what otherwise could be given only by travelling; namely, the strange" [27].

## 5. Discussion and Conclusions

Having introduced not the 'Eyes on the Street' Jane I. Jacobs, but the other Jane M. Jacobs in the title of this contribution as well as Jean Gottmann in the Abstract, it is now time to call on their help to tie the main strands of this article together. Our analysis suggests that with the attenuation in demand for downtown skyscrapers the age of the starchitect has reached a temporary if not permanent hiatus. A sign of the future may be glimpsed in Skidmore Owings & Merrill's Hudson Yards complex, which is adorned by a brass 'Vessel' designed by timber designer Thomas Heatherwick and contains only two main skyscraper towers with a massive cultural edifice on wheels named 'The Shed'. It is the first LEED Gold Leaf Neighbourhood in Manhattan with the centrepiece of a large, landscaped esplanade framed by a double phalanx of medium-rise office and residential blocks culminating in two super high-rise towers and one mezzanine tower, a retail pavilion and a shopping mall anchored by a Neiman Marcus store. However, more surprisingly, it contains 14 acres of public open space. The Kohn, Pedersen & Fox (KPF) tower is LEED-certified and no cars are to be seen, only a subway station, two Long Island Rail Road stations, pavilions and promenades above the entry to Penn Station and associated railyards. The 5 acres of gardens and public plazas on the site's Eastern Yard were designed with Heatherwick Studio as an 'immersive' and varied horticultural experience. It displays over 28,000 plants and includes over 200 mature trees, woodland plants and perennial gardens. The southern edge features a Pavilion Grove filled with a shade canopy of native trees, while to the north is a birch grove and a new entrance to the High Line. While hardly 'Bosco Verticale,' echoes of Stefano Boeri are heard in its native perennial gardens and wildflower patches that attract migratory birds and pollinators. Pedestrians may experience paths lined with nearly a mile of garden seating walls and no cars. As even Jane I. Jacobs might have put it, this being the largest private real estate development in US history it is surely a 'Big Thing'.

Hudson Yards followed the 'financial crash' of 2008–2009 and although unapologetically 'urban', its style is humbler than its starchitectural new cityscape forerunner, while paying due attention to the 'greening' sensibility (Table 1). It represents some degree of 'blending' of high-rise and retail mall work with parkland recreation combined with consumerist retail therapy. As we saw, this is in some conflict with the more radical agritectural repurposing of redundant industrial or office-based urban real estate, which

were revealed as largely 'wishful thinking' based on a flawed, if romantic, business model. Nevertheless, working and shopping from home still mean empty urban buildings that will increasingly avoid demolition by becoming mediocre, if necessary, adapted dwellings for under-served urban households. For Paris, the home of Parkitecture as practised by now-Presidential candidate Mayor Anne Hidalgo, the desire to defeat pollution and make the 15-min, pollution-free city a reality, the needed investment being largely public or at best public-private seems a better business model, needing mainly a planning vision and a horticultural labour force. What has to be guarded against is 'corporate blowback' whereby commerce goes on strike to compensate for the undermining of its historic entitlement to monetise, so these interests will need firm regulation, including occasional incentivisation.

**Table 1.** Impulse drivers of cityscape visions.

| Starchitecture | Agritecture | Parkitecture |
|---|---|---|
| Re-Making | Repurposing | Substitution |
| Neoliberalism | Artisan Food | Rewilding |
| Deconstruction | Opportunism | Tranquility |
| Growth | Wellness | Transition |
| Hyper-Urbanity | Organicism | Greening |

The notion of 'Big Things' in cultural geography is a way of trying to come to terms with scale in the built environment and how it expresses something of the age it appears in, which can be an admission of failure, which some 'big projects' such as the abandoned and even demolished or burnt out housing schemes including London's death-trap Grenfell Tower, shopping centres and office towers of a once 'modernising' era represent. Even Hudson Yards represented the failure of New York to win the 2012 Olympics, for which the site had once been earmarked, hence its availability for skyscrapers. Skyscrapers are clearly 'Big Things' in the urban landscape, seldom seen in rural settings or much in suburbia. They thus initially represented a change from manufacturing to information processing, 'frictionless' movement, trust in technology, hierarchical management (the C-suite), phallocentric design, and the monetisation of space. Gottmann noted that skyscrapers were only critiqued in his Soviet Union homeland, where they were condemned as a symbol of 'excessive capitalist greed'. Noticeably, Moscow's were not centralised like Manhattan, but strung out as 'the Seven Sisters' along the ring-road, albeit some were administrative, others apartments and hotels and the tallest was the Moscow State University. Khruschev in 1955 condemned them as 'architectural excesses' and decreed their expense unacceptable in future. If anything, they have remained universal icons of 'Big Power' narcissism, especially since the onset of the 'Attention' economy that monetises 'celebrity' amongst architects, bankers, tech entrepreneurs, who join 'pop royalty' as status symbols for their 'innovative' expressions of 'self'. Such targets were lured to support urban boosters to spend public money excessively in their desire to wish reality away. 'Starchitecture' was the apotheosis of this 'cult image' shared among urban narcissists [28]. The questions of interest here have been: is 'starchitecture' on the way out in the face of urban abandonment occasioned by the financial, climatic and pandemic crises? Have these crises, as is widely presumed—together—undermined 'Big Things', 'Big Thinking' and urban excess? A further question is: can such starchitectural 'cult objects' as represented be seen to give rise to 'Agritecture' as a novel replacement for offices and malls, whether designed by 'starchitects' or not? The final question is: are central cities as defined by retail malls and office complexes likely to be replaced by a newly discovered 'greening' of downtown city space to attract visitors, shoppers and workers back after these omni-crises pass? These are all issues for adherents to 'open innovation', whether in studying new forms of innovation in response to the pandemic and other crises, even importantly, in urban food processing innovation [29,30].

The interim conclusions are reasonably clear. In answer to the first pair of questions; judging by the experience of Hudson Yards as a case in point and even the failed efforts of

the techno-entrepreneurial 'smart city' apostles, provided that there is money, narcissistic desire and the urban vanity to warrant it means that 'starchitecture' can easily mutate by accommodation to the 'sustainable city' agenda. Moreover, it can easily adjust to the replacement of iconic built spaces in newly developing schemes by facilitating mini-prairies of horticultural planting incorporating domesticated or wilder native species and parlaying the cost in further levels of iconic high-rise floorspace. What seems to be true, from the accounts extracted, is that many investments already made in Canadian cities have disappointed. These were widely presented as having invented vertical farming or Agritecture to replace and repurpose abandoned downtown retail and high-rise office accommodation with purposeful 'urban food strategies', but much former optimism has been replaced by the cold-bath of realism. Three things seem for now to have mitigated this dream: first, even though fairly generous public funding was available to augment private investment in such re-purposing, it is horrendously expensive to equip existing buildings with high-tech hydroponics, aquaponics or aeroponics equipment for vertical farming; second, it is surprising how narrowly vertical farm production was defined by numerous instances of salad-based horticulture, all chasing the same urban customer with much the same not especially nutritious side-dish. This resulted in many short-term bankruptcies, which will likely persist until vertical farming broadens its offer, but in turn requiring more costly equipment in all probability. However, some will probably survive but for the moment as a marginal pursuit in the urban economy. Finally, what of 'Parkitecture'? This seems to have a good chance if, as currently predicted, 'Big Things' will be required to replace the parts of the 'skyscraper and shopping mall' model that has prevailed in many cities for the past fifty years and more. The signs from large cities such as Paris, New York, London, Milan and Barcelona and much smaller, local centres such as Stockton are propitious. Such municipal authorities have been made aware that cars, pollution, congestion and 'overtourism' have reached 'peak discomfort' in the face of online shopping, 'working from home' and re-balancing the work–life relationship. The flight to the suburbs and beyond in pursuit of fresh air, home or garden office space, community life and no or lightly blended commuting mean that cities will depend increasingly on the talents of 'star' parkitects such as Piet Oudolf, Stefano Boeri and mayors like Anne Hidalgo to encourage the 'new suburbanites' to venture back downtown to see the prairie planting.

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