

Pairs Work Better than Singles

Beginning with the Bees

In 2008, AnneMarie Maes and her collaborators installed several hives on the rooftop of Okno (Russian for 'window'), an artist-run space in an old industrial flour mill on the west side of the Brussels canal. A year later, she installed two more hives 400m due east on the roof adjacent her studio. Urban beekeeping had not been practised since the 1950s, so potential beekeepers faced huge learning curves. Her primary focus was to observe the bees to see whether they might meet up with bees inhabiting Okno's rooftop garden. In her 16 May 2009 journal entry, she wrote 'Will they mix and mingle and what will be the taste of the honey they'll produce: a flavour of curry and lavender or will they go for the sugared city fast food: lemonades and coke? We'll keep you posted with bee-stories over spring and summer...' (Maes 2011: 208).

Following the bees' arrival, two very different rooftop gardens arose. Adjacent her studio, she created an edible forest garden using the layers of natural woodland as a model: trees, shrubs and herbaceous plants and annual vegetables (Maes 2011: 133-134). By contrast, a self-organised wildflower garden (seeds randomly dropped by wind and birds) sprouted atop Okno, enabling participants to test the effectiveness of various substrates such as crushed clay, lava and bims (pumice stones). She noted, 'We would like to focus on the role that green roofs can play in the conservation of biodiversity in the cities and their functionality in terms of habitat for wild plants, for insects (bees, solitary bees, wasps and ants) and for birds' (Maes 2011: 28). One reason that biodiversity was on Maes's mind is that around the same time that she started beekeeping, she followed Vandana Shiva's one-week workshop at Navdanya Farm in Dehradun, IN, where she learned that biodiversity increases resilience and decreases vulnerability (Maes 2011: 206). Working with two very different gardens enabled the artists to grasp each garden's distinct impact on honeybee wellbeing, as well as the relationships between biodiversity and sustainability, maintenance issues, entropy, etc.

Throughout 2009, Okno participants monitored climatic factors such as temperature and rainfall to better understand their effect on floral diversity. Maes characterised this as 'vegetation dynamics in different OpenGreen patches' (Maes 2011: 28). One of this artwork's earliest goals was data harvesting using cameras, microphones and sensors, whose recordings could be presented as multi-media installations (Maes 2011: 34). To this end, they broadcast performances of plant and wind sounds, and created sensors that translated pollution signals into sound and video (Maes 2011: 35).

Always eager to learn, Maes registered the sights and sounds of both gardens in great detail. As she is quick to point out, comparison is necessary for research. She mostly wanted to discover which environmental aspects make bees content. Do they easily find food? Can they thrive atop urban rooftops? If so, should every roof be adapted for bees? At one point, she even worked with a scientist to assess whether the roar of low-flying airplanes (one of the three main air routes into/from Zaventem Airport flies over the Brussels Canal) affects bees, since bees are generally environmentally-sensitive. She wanted to know whether such external stresses affect bees' communication patterns. Luckily, the noisy airplanes proved insignificant.

Perhaps her most important observation during this period was the way bees flit from gardens to brownstones to city parks to allotment gardens, creating the possibility to conceive cities as 'Connected OpenGreens', enabling people to grasp each city as a bee ecosystem. A full decade later, the European Union has finally caught on, mandating the

'rewilding of Europe' and the creation of habitat corridors to connect and preserve fragmented habitats within cities.

The Intelligent Guerrilla Beehives (IBGs)

Maes's gardening and beekeeping efforts were meant first and foremost as a source for ideas and materials for future artworks. One of the most important artworks to come out of this process is the *Intelligent Guerrilla Beehive* (2015-2017), a speculative sculpture that arose precisely in response to urban bees' need for safe refuges. In fact, there are two: v1 (2015-2017) and the slightly larger v2 (2016-2017). Sporting a biosensor that interacts with the environment and measures the pollution levels of nearby foraging fields, these portable hives comfortably accommodate a swarm when few options are available. Over the past few years, Maes has been researching the way certain bacteria provide bees pharmaceutical properties. As a result, her portable hives have a double-layered exterior membrane, or 'sensorial skin', that is a smart fabric made by *Acetobacter xylinum* bacteria and yeast cells grown in the studio and then inoculated with living *Lactobacillus plantarum* bacteria. 'It is augmented with a mix of organic and electronic elements for sensing and actuating for computation and communication. *Lactobacillus plantarum* bacteria living in a biofilm on the upper cellulose skin act as biosensors, whose colours and patterns change in response to environmental threats' (Maes 2017).

The hive's form is derived from a single grain of strawberry pollen and its inner skeleton was 3D-printed with bioplastics at the BioHack Lab in Barcelona, ES. The bees inside and the exterior bacterial skins remain living sculptures that double as monitoring technology. Maes adds, 'My work not only gives rise to fascinating images, useful ecological data and new ideas for building sustainable beehives, but it is a political statement, arguing for the integration of nature as a social/sensory/phenomenal living matrix...Specifically, it draws attention to the fragile affinities between humans, bees, bacteria and the urban neighborhoods they symbiotically inhabit' (Maes 2018).

In 2017, Prix Ars Electronica awarded her *Intelligent Guerrilla Beehive* an Honourable Mention in the Hybrid Art category. In keeping with her goal to draw attention to the fragile affinities between humans, bees, and bacteria, she has exhibited both prototypes widely. *Intelligent Guerrilla Beehive v. 01* was presented in 'Ars Electronica', Linz, AT; 'Tendencies', BOZAR, Brussels, BE; 'Nova XX', Halles St. Gery, Brussels, BE and Laboral, Gijón, ES, whereas *IGB v. 02* was exhibited in 'Resonances II', Ispra, IT; 'Resonances II', Science and Technology Museum, Milano, IT; 'Nova XX', Halles St. Gery, Brussels, BE; Museum for Contemporary Art, Riga, LT; Museum for Architecture, Art & Technology, Lisbon, PT and Museum of Contemporary Art, Eupen, BE. That this pair exists makes participation in contemporaneous exhibitions possible.

From Speculative Art to Public Art

Interestingly enough, Hamburg is home to the first modern 'cageless' zoo, Tierpark Hagenbeck (1907), which currently hosts 530 species, so Germany's second-largest city (Europe's second largest port) has been biodiverse for over a century. Between 1995 and 2009, the Botanical Association of Hamburg mapped the locations of 1643 different vascular plants inhabiting 1km² cells. The greatest richness of plant diversity was found in the port area and semi-natural habitats (Schmidt 2014:2). Despite the prevalence of South African native *Senecio inaequidens*, only 12% of Hamburg's plants are non-native, which is on the low end for a port city. Moreover, Hamburg hosts 38% endangered plant species (Schmidt

2014: 114). Hamburg honeybees primarily feast on the flowers of Linden and Chestnut Trees, as well as fruit trees and native wildflowers.

It's thus no wonder that when Dirck Möllmann was appointed Stadskurator for the City of Hamburg in 2018, he immediately envisioned commissioning Maes to produce an artwork for 'Hamburg Maschine'. The first thing he wanted to know was whether she could 'scale up' her speculative sculpture, which he first encountered at Ars Electronica, to become public art. Although such a request sounds like a dream come true, realising a living sculpture on the scale of public art is a daunting task. Moreover, Hamburg's Elbe River holds a special place in the heart of land artists, such as Maes, since Joseph Beuys tried twice to intervene on that site: *Elbe Aktion* (1962) and *Gesamtkunstwerk Freie und Hansestadt Hamburg* (1984), which won the 1983 'Stadt-Natur-Skulptur' competition.

Beuys specifically chose Altenwerder spülfeldern for his 'gesamtkunstwerk', an infamous site adjacent a former fishing village (southwest of central Hamburg), whose inhabitants had been forcibly relocated and its traditional buildings demolished following a 1973 Senate resolution (Spaid 2017: 152). In 1984, Hamburg's mayor notoriously vetoed Beuys's winning 'gesamtkunstwerk', for which he had proposed using phytoremediation to restore fields poisoned with heavy metals dredged from the Elbe. Given the citywide effort needed to stop the dredging and dumping on these fields, Beuys envisioned his artwork encompassing the transformation of inhabitants, business owners and politicians alike.

Given Maes's appreciation for 'Connected OpenGreens', it's no wonder that she considers *ElbBienen* (2018-2019/present), which hosts a fully developed honeybee colony tied to Beuys's 1983 proposal. He had planned to install a one-ton basalt column from his *The End of the Twentieth Century* series (1982-1983) to permanently mark the location of Altenwerder spülfeldern, located 8km southwest (as the crow flies) of Entenwerder, where Maes's hive is a permanent mark. Bees tend to fly only 4km from their hive, so we imagine that with each successive bee generation, their offspring will start to head southwest with the wind, eventually connecting the six OpenGreens situated between the Golden Pavilion on the Hamburg side of the Elbe River and Altenwerder/Moorburg. It's no coincidence that Möllmann also curated 'Everything Flows, a Panorama of the Elbe' (2007) the Altona Museum's 31-month long exhibition focused on Beuys's 1984 Hamburg proposed sculpture.

As mentioned above, bees are bioindicators of healthy environments, so if they continue to swarm and venture southwest (in the direction of the original spoils pile), one could assume that the site has been remediated, as vegetation took over. If they remain within the vicinity of Elbpark Entenwerder, one suspects that the western fields remain polluted. Thus, Maes's public artwork also avails 'monitoring technology'. Hopefully beekeepers stationed along the route to Altenwerder know to look out for future bee swarms. Not surprisingly, *KanalBees* (2019/present), a twin wooden hive, is situated on her rooftop so that she can compare its influence on Brussels versus its role in Hamburg. Once again, pairs work better than singles.

Rather than 'scale up' her speculative sculpture, Maes produced a 'weather proof' solid wooden sculpture for the Entenwerder location that hosts an ecological hive inside. To model the inner hive, she initially devised several paper models, but finally opted for an ecological Warré hive. For the sculpture's exterior, which resembles *IBG v. 2*, she chose a particular wood and she totally rippled its surface to attract lichens, which are known bio-indicators for atmospheric pollution. An architect translated these forms into technical drawings that could be used to carve a wooden cube using the latest digital fabrication technology in the robotic wood workshop at the Vienna University of Applied Arts. To fill the *ElbBienen* hive with bees, a local beekeeper arrived May Day 2019 with a swarm in a box. After placing the queen bee inside the hive, the swarm quickly followed suit. The beekeeper then proceeded to climb the

pylon's stairs to the sculpture mounted on high with the hive on his back, which he delicately slipped inside the sculpture's interior cavity.

The *ElbBienen* hive plays a similar role as Maes's speculative sculpture. Although it lacks a bacterial skin, it has five electronic sensors inside to track temperature and humidity plus two outside, and physiological sensors such as lichens that monitor pollution. Its presence adjacent the Golden Pavilion serves as a constant reminder of human wellbeing's dependence on bees and Hamburg's biodiversity, while serving as the gateway for bees departing to Connected OpenGreens. Moreover, the public can follow all this information – realtime streamed images of the camera and realtime data of all sensors on big screens inside the Golden Pavilion. There, visitors can compare the visual and data information of *ElbBienen* bees with that of the bees residing in *KanalBees* 600km away.

ElbBienen makes the 'flight of the Hamburg honeybee' visible, as cameras trained on the hive's entry point invite people across the globe to observe bees coming and going via an Internet portal. I imagine inhabitants familiar with *ElbBienen* becoming quite excited by bee encounters elsewhere, as they recall their experience with Elbpark Entenwerder bees. Freed from human greed, these bees produce honey for their own use and nourishment, a sly effort on Maes's part to rebut profiteering and thwart human dominance during the anthropocene.

On this level, Maes's notion of 'Connected OpenGreens' proposes an alternative to cities, as depicted in *Metropolis* (1927), whose tightened gears and well-oiled chains ensure their smooth operation. Maes's model visualises what she terms 'organic digitality', a veritable self-organising beehive devoid of organisational charts. Sited high atop the harbor, her 'massive' beehive is a beacon beckoning citizens to adopt decentralised systems, the natural outgrowth of the digital era's capacity for knowledge sharing. The image of bees buzzing about Hamburg as indicative of its biodiversity recalls the emergence of wireless radio spontaneously popping up in people's living rooms some 100 years ago.

Hamburg's St. Pauli Hafenstrasse is well known for its spirit of resistance, protestors and activism. Whenever Hamburg residents take to the streets or retake city parks, they emulate bees venturing through 'Connected OpenGreens'. Linked via Twitter, Facebook and TikTok, today's marchers convey solidarity with protestors thousands of kilometers away, further proof that pairs work better than singles. In contrast to 'Smart Cities' that risk being rigged by the one on top with access to big data, today's most beloved cities operate like Maes's notion of 'Connected OpenGreens', since they're places where biodiversity, connectivity, openness and pluralism motivate everyone to take risks and venture forward.

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