The Window Unit: Low-tech animal husbandry in the high-rise

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Like humans, animals have also witnessed a steady shrinking of their territory, space, or landscape of inhabitation. The Window Unit creates individualized animal habitats that take advantage of the human environment in a way that allows for a mutatismutandi relationship. Chickens, bees, and fish gain a useful and previously uninhabitable space in the air, their living quarters curiously fastened to a window ledge via a simple and solid steel armature.

Borrowing design intuition from the much maligned window air conditioner units found in cities around the world, this appendage uses the existing structural frame and the accessible aperture of the window to create a new liminal space, between inside and out, between the human and animal realms. Improving useful food for the household inside, the Window Unit is a form of architectural mutualism. This synergistic relationship couples habitat for animals with edible products for humans, creating a scalable model for increasing urban self-sufficiency.

Each type of Window Unit has been designed to reflect the unique needs of the animals it houses. Like conventional bee hives, aquariums, and chicken coops, these individualized habitats create autonomous zones for each species to thrive. And like those predecessors, each of these idiosyncratic protuberances has an articulated human edge at the building envelope dedicated for feeding, cleaning, and harvesting.

Animal-populated Window Units enable the resurrection of household-based urban food production. This bottom-up agricultural strategy enables urban dwellers who elect to stock their window space with chickens, bees, and fish in creating a new urban food system. Working at a very small scale, with eminently replicable technologies, these wall projections have the potential to link on-site agricultural production to vast numbers of independent households.

Because the Window Unit is a small and scalable feature, it can be produced for affordability and incremental growth. Although the shape of each type of Window Unit differs, the design of each of these habitats adheres to the standard condition of a typical window HVAC unit at the building envelope. This interface with the room inside the building occurs by way of an access aperture, which can be opened by humans to clean, feed, or harvest. Outside of the building, each Window Unit sheds water, self-ventilates, and defies temperature extremes through a thick plastic cast insulating shell.

Each Window Unit provides approximately four square feet of productive habitat for resident animals. This tiny farm space will produce up to 50 pounds of honey per season, 600 eggs per year, or several hundred pounds of fish and vegetables annually. And while Window Units may be dispatched across the globe like their window heating and air conditioner predecessors, their contents necessarily develop cultural, climatic, and economic specificity. The same method and structure used in these examples can be readily modified to fit local conditions and to house a wide array of productive species.

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GALLUS GALLUSS DOMESTICUS
The Laying Hen

Number of inhabitants: 2 Cost for supplies: $4.50 per chick $200 per year in ongoing food Supplies needed: Food scraps and pellets, water, fan, food bin Yield per year: 600 eggs
Calories per egg: 65 calories Cost per calorie: $0.0052 Cost per pound of egg: $0.33 Annual calorie yield per window: 39,000 Annual calories required for one human: 2,250,000 Percentage of annual caloric needs: 2.2%

The Window Unit chicken coop holds two laying hens and all of the gear they need for survival. A high rooting bar, low laying nest, and feeding area comprise the interior space. The door connecting to the household is easy to access, permitting cleaning, feeding, and egg retrieval. If this Window Unit is placed near the ground, the hens can be let out via an integrally fixed ramp hatch for daytime excursions.

OREOCHROMIS NILOTICUS Niloticsus
Farmed Tilapia Fish

Number of inhabitants: 10 mature fish per tank Cost for supplies in the first year: $30 for pump and filter Supplies needed: Recirculation pump, fish food Yield per year: 50 lbs of fish and produce Calories per pound: 437 calories in 1 pound of Tilapia Cost per calorie: $0.0015 Cost per pound of fish: $0.06 Annual calorie yield per window: 2,187,000 Annual calories required for one human: 2,250,000 Percentage of annual caloric needs: 24%

Both vegetables and fresh fish may be harvested from this aquaponic Window Unit. With a simple low-tech biofilter and pump, the water in this tank remains aerated and clean. Tilapia grow quickly and are resilient in tight quarters, their ammonia undergoes nitritification to feed the plants above. These plants thrive with a simple root mat, water, and the nitrogen-rich nutrients coming from fish waste.

APIS MELLIFERA
The Honey Bee

Number of inhabitants: Max order sets of 3,000 hives and a queen Cost for supplies in the first year: $10 for start-up supply kit Supplies needed: Protective suit, smoker, extracting tools Yield per year: 50 lbs of honey Calories per pound: 22 calories Cost per calorie: $0.00142 Cost per pound of honey: $3 Annual calorie yield per window: 109,600 Annual calories required for one human: 912,500 Percentage of annual caloric needs: 11%

Based on the classic Langstroth bee box, this Window Unit features two separate zones: a brood box (for the colony) and a honey super (honeycomb harvesting space) with a Queen Excluder between. Stabilized to shed water and allow for humans to harvest honeycomb through the window, a sawtooth shelf system supports rungs at variable heights. A protective opening allows bees to freely come and go without compromising the thermal envelope. When extracting honey, a smoker is used to keep bees out of the house.