Symbiotic Parasitic Architecture:
Architecture at the 25th Level
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"Confusion arose over the following years and biologist began to equate "symbiosis" with "mutualism. Today, most biologists have reverted back to the original broad definition: symbiosis is the living together of different organisms, usually in close association with one another, to the benefit of at least one of them. The partners are referred to as symbionts."
http://www.eden.rutgers.edu/~tavisa/Symbiosis.html

“A parasite lives in a close relationship with another organism, its host… The parasite is dependent on its host for its life functions. The parasite has to be in/on its host to live, grow, and multiply. Parasites rarely kill their hosts."
http://student.biology.arizona.edu/honors98/group15/whatisasparasite.htm

Urban densification and issues in sustainability have directed growth towards construction within the urban core. Current technologies and business acumen have called for new considerations in living and working, architecturally demonstrated through “live-work” areas, “home offices” and mixed use buildings that now incorporate residential units. Traditional concepts of office space require re-examination and may become obsolete with regard to singular tower development.

Intensifying the core and linking into existing infrastructure encourages new, efficient, communities that would most likely be configured around towers and concentrated lots. Inspired by forest ecologies and canopy stratification, new niches at the upper levels of the city have the potential for occupancy. Taking a page from Montreal’s Underground City (as one of many inspirations) concourses of interactivity and mixed uses may be created along certain strata of the cities vertical axis.

The office towers of 55 King St. W. in Toronto, present a campus configuration in an urban centre from which a community may be shaped at an upper level. Furthermore, a system of units can be installed that traverse the divides in a nascent district constitution creating program between buildings at the ‘25th floor. A symbiotic relationship between new form and existing structure will allow for an efficient use of infrastructural resources while allowing residents to live and exist at many levels of their environment, fully occupying three dimensions of space. The map of activity may now include a second tier for shopping, schooling, working and living, well above grade.
**Thesis Premise: Niche Occupation**

The space between high-rise towers presents a niche otherwise unexploited. It is an opportunity to consider a structure that may grow from the inside, or latch onto the façade of an existing building to be used for additional program at a higher canopy level of the city. Such constructs would parasitize, either symbiotically or otherwise, an existing tower and have the potential to grow or multiply. Systems would eventually bridge between two towers creating a link. This process may repeat many times throughout the city creating an elevated network of concourses onto which units may connect or ‘plug in’, growing as naturally as a typical forest ecology.

The Toronto Dominion Bank Tower complex in downtown Toronto is best suited for an investigation of an architectural canopy to the city, at the 25th floor level. Re-examining the works of Yona Friedman, Archigram, Lebbeus Woods; studying the concepts of utopian arcologies and stratified city structures, the thesis investigates interconnectivity and ‘mesospheric’ programming that may emulate natural environments. Structural systems and load bearing constructs would influence the aesthetic as well as the colonization process. As nature abhors a vacuum, form will facilitate occupancies adapting to the needs of the people. Maximizing space utility, one system may feed off the other and interconnect with adjacent systems in a true network, as with true ecosystems, providing shelter and comfort to inhabitants. New circulation systems will develop, not simply along a 2-dimensional grid, but connecting multiple levels, thus considering a 3-dimensional system. Society will need to conceive of multiple entry doors and lobbies, reconsider roads and pedestrian systems as well as the concepts of public and private space. In a real ecosystem, where are the boundaries between individuals?
Primary Area of Study: Form and Function

Parasitic systems have many strategies for surviving. There are methods of attachment, reproduction, and sustaining themselves in situ. To develop a new space within or upon an existing structure requires a strategy that not only provides a new program element, but a method to maintain an attachment and structural integrity. New program may develop in the space between forms, culminating in a system that is akin to a horizontal building on the ‘25th’ floor. A community system is to be examined; a nascent form that can be placed in order to function homogenously between towers.

The elements of the program are to be flexible in order to be placed in several configurations and allow for a number of variations. Like Montreal’s underground city, there will be retail/commercial space, with the addition of residential units. These units need a system to latch onto a structure and each other. How a parasitic system develops and grows into a community above the ground introduces possibilities of spaces above and below infrastructure and allows the examination of living with glass floors and parks above the city. Between the ‘floor’ map and a new canopy map, niches of occupancy open up. As is nature, people have the capacity to adapt. Providing a template form and framework, people will take up spaces and make them their own. What will that look like and what tools are available to allow this are significant to this investigation.

Structure, capacity and aesthetic are primary concerns. The interconnectivity of a viable, initial program are accordingly important. Furthermore, what are the aspects of a nascent community that takes hold in the upper strata and begin to grow? An ecological niche is there for the taking, in this there needs to be a series of adaptations for hominid existence above the ground in the urban forest we have set up to occupy.
Program: The Horizontal High-rise

The program will require a series of phases.

The initial phase is based on primary colonisation. Offices will expand laterally based on expanding outward occupancy and vacating spaces from floors below and above. Vacant areas will be reoccupied by residential units or other offices. The connection between buildings will occur through lateral office expansions. Interconnections will then spur the growth of tertiary occupancies on uses.

The final phase will consider a full urban concept implemented within the expanding framework of the occupied levels.

**Offices** – to replace the areas occupied by the construction.

Offices may eventually be replaced or re-allocated through the use of live-work residences and alternative use units.

**Residences** – x 1 bedroom units, 500 to 600 sq.f.

y 2 Bedroom 650 to 800 sq.f.

z 3 Bedroom 650 to 1000 sq.f.

- Kitchen, 2 bathrooms (1 Bath and 1 wc. min.), 1 closet per bedroom, laundry, storage, den, Living/dining areas.

**Primary School** (Daycare) – 30 to 75 children -- 6,000 - 10,000 sq.f.

- 5 Class or Group rooms
- Storage
- Vestibule & entrance
- Administrative offices (6 to 8)
- Kitchen
- Garbage, Shipping/Receiving
- Lobby
- Bathrooms (M &F)
- Laundry
- Lounge
- Pick-up/drop-off
- Resource room
- First Aid
- Exterior space
- Common Area

**Retail Shops** – number to be determined, 750 sq.f. each

- Coffee Shop
- Home Accessories
- Fruit & Veggie Store
- Convenience store
- Small hardware
- Meat Store
Health Centre - 10,000 sq.f. Gym

- Bathrooms (M & F)
- Change Rooms (M&F)
- Storage
- Reception
- Squash courts
- Aerobic Rooms
- Towel room
- Laundry
- showers
- Sauna

Library (optional) – 10,000 to 20,000 books, 7,500 sq.f. to 10,000 sq.f.

- Administrative offices
- Bathrooms (M & F)
- Stacks
- Storage
- Shipping and Receiving
- Security
- Reading areas
- Librarian centre - Loans
- Returns, order desk
- Multimedia area
Site: 55 King St. West – Bank Tower Complex. (Toronto)

The site is the location of Mies van der Rohe’s Toronto dominion Bank Towers and ‘Commerce Court’. The Toronto Dominion Bank Towers are a complex of two high-rise buildings and a one story banking pavilion (North East Corner). With 56 stories the main tower (1967) is off-center, South East on the site. A second tower of 46 stories was completed 1972 as part of the complex (Centre North). Across the street is First Canadian Place, Canada’s tallest office building at 72 stories (1976). The site also houses the 31 story Earnst and Young building that is similar in appearance to the Mies structures: It occupies the space that was the site of the original Toronto Stock Exchange and incorporates the original Façade in the East Elevation. The 32 story Canadian Pacific Tower and the TD Waterhouse tower of 36 stories are situated along the western edge of the block.

It is the centre of commerce for the city housing all the major Canadian banks, mining companies and financial institutions. There is heavy residential-condominium development in the area, illustrated by the 1 King West development on the Eastern adjacent block, owned in part by the Mirvish family. Toronto’s downtown is transforming, residential and commercial zones are slowly merging, and ‘mixed use’ is a powerful development word.

The commercial centre provides a ‘campus’ of similarly designed buildings of sufficient height to test the concept of a canopy-parasitic architecture. The structures are dispersed in a way that will allow an exploration of systems that would span between them. Additionally, there are a number of buildings in the area that would allow future expansion. Moreover, within the area are a number of new developments in residential
construction, hotel buildings, health clinics and a series of retail and entertainment areas that reinforce the mixed use program investigation. Linking these into a new urban ecology is the challenge of the proposal.
Mode of Production: The Making of a Canopy Ecology

There will be a number of systems employed in the exploration.

To begin, I shall examine land use maps, urban planning diagrams and floor plans. With these I would like to draw, collage, and diagram the site pertaining to current uses, proposed applications and perceived patterns of use. I would also like to examine forest canopy and terrestrial ecologies with interest in territoriality, species niche overlap, and spatial organization.

This will also influence modeling forms. I would like to begin with a scaled site model and experiment on modes and methods of creating a structure that would span and occupy the upper levels of these buildings. Explore how an architecture can ‘parasitize’ the existing systems and grow from them. If one is to infect a building with a new program, how would it manifest, grow and colonize adjacent buildings? A hands-on approach is necessary while keeping in mind natural strategies and forms. A unit specific, or modular form may be necessary in order to begin in one place and replicate itself. This is the primary area of comparison between natural and human worlds. I would like to examine structures and strategies in nature and how they are used to occupy a forest niche among the tree tops. In some cases I would like to consider ants and various insects, birds and nesting systems, as well as other families.

The next step would be to take the study into the digital realm. This would allow, not only an interpretation of the physical form models, but may allow other avenues of exploration in structure, aesthetics, and program functionality.

This multilayered approach not only assists in the study, but illustrates the profound complexity of both a natural system and the human urban jungle.
Conclusion:

We are living in an ever more crowded city. With the demand for land and occupancy on the rise and the pressures to conserve the environment and natural resources, it is important to examine new areas for development. The city, from the standard urban plan and architectural designs, is a mosaic of lots which do not effectively capitalize on lost spaces and those areas in between buildings. On the ground level there are many elements that keep structures separated and spaces unoccupied, but at the upper levels there is opportunity to integrate systems and reintroduce the village into the environment. As inspired by underground networks and the ecologies of forest canopies throughout the world, there is a niche waiting to be occupied.

The use of 55 King St. West, Commerce court, allows us to test the idea. The centrally located node is a launching point for a budding system that will span between existing buildings and alter our perception of urban form and use. Not simply to traverse space as a bridge, but to occupy it, not in a single function, but with multiple functions and overlapping layers of activity, giving it a life of its own. We shall look to natural systems for inspiration on coping with the challenges of living high, and on strategies of occupying space and replicating units throughout the canopy. In this, form, use, and program will evolve, adapt to a dynamic environment free from the conventions of building on terra firma. Parasitic canopy architecture will introduce new methods of occupancy and examine unique concepts in planning and architecture on the ‘25th’ floor.
List of Primary Sources:

   A Study of cantilever structure with a significant program incorporated.

   Precedent study into school design and programming.

   Unique structures and forms based on a number of strategies.

   Concepts in residential design and unit programming.

   Innovative parasitic structures. Development of attachment methods integration into existing environments.

   Precedent study into school design and programming.

   Concepts of urban planning for the ‘future’ incorporating living and working at different, stratified levels. Communities and new architectur, a vision for density and sustainable development.

   Using new development concepts for densification and urban living. Using parasitic architecture and structural design, communities may be able to occupy new and different places to occupy.

   Unique structures and forms based on a number of strategies.

   A collection of theories and ideas to consider in the development of city planning, community development and analyses of current and past strategies of development.

Precedent study into condominium and residential design and programming.


Unique structure in developing program. Alternative strategies and possibilities given standard materials: reinterpreting concepts in forms.

**List of Secondary Sources:**


