

Designs & Initiatives for the Cause of Urban Agriculture under The Permaculture Movement and Toward an Age of New De-carbonized Driven Architecture

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I had come to learn that the original Permaculture Handbook written by ecologists affiliated in the academia of Australia - David Holmgren and Bill Mollison, was a response to the world's Oil Crisis in the 1970s. It outlines and illustrates Old World Traditions on how to grow organic food to designing homesteads that use nature's patterns and principles rather than relying on Industrialization methods and burning fossil fuels to create a sustainable environment for human habitation and other living beings in co-habitation.

Permaculture is a way of life for humans to be more sustainable and holistic instead of relying on human-invented technologies that require embodied energy that pollutes our natural environment by releasing Greenhouse Gases. Permaculture is an approach and a philosophy that beckons back to Indigenous ways which 'lasted for millennia' where human settlements would weave together microclimate, plants, animals, soils, water and human needs into intricately connected, productive and yet inter-dependent communities rather than through human dominance and control of the environment and over other living creatures which basically disrupts and destroys rather than balances the natural forces of our planet. And in the realm of Architecture – it would be designs that are mostly aesthetically driven and without much consideration of how the materials are made in terms of their pollution to our environment or how much fossil fuel is required to keep the interior architectural space comfortable for Human habitation. According to scientific studies, average annual building energy usage accounts for around 1/3 of our global annual Greenhouse Gas emissions. Also, the James Cameron (the acclaimed Canadian born film director) backed green documentary series: **The Years of Living Dangerously** series with 17 episodes with the biggest Hollywood Stars to travel around the world on the urgent topic of Climate Change and Arctic glaciers melting with one episode with scientists or environmental activists on Rising Sea/Ocean Levels and how the rich 'Global North' countries are responsible for causing and accelerating Climate Change will soon have devastating effects on low-lying coastal areas of the United States and even half a world away to the 'Global South' with Bangladesh being the epicentre.

The current Social & Cultural critics/activists I follow would suggest that all this a direct result of the culmination of a one-dimension linear development of the ideals/models perpetuated and upheld in the Colonial, Imperialistic, Modern Industrialized Capitalist Era/First World culture we are part of (a historical period have not lasted even 300 years yet). In fact, I would conclude to blame as the

root cause for our current Worldwide **Covid Pandemic** predicament for bringing about a global fossil fuel competition based on destroying our natural environment and the imminent extinction of living species on the planet (as many scientists have been warning) and as well making humans now both physically and mentally sick; because the world now competes on a global Industrialized level.

My journey with the **Current Social Green Movements** began with my interest in the Sustainable Architecture Movement around my LEED accreditation in the mid-2000s. I was working for a small Architectural firm in mid-town Toronto, where I befriended a local neighbourhood initiative group promoting residential solar PV panels and solar thermal hot water tank installations for homeowners in the area (in the late 1990's I believe it was). The group called themselves - **Green Neighbour 21**, located in (the then #21 Ward of Toronto) just north-west of the downtown core. We met every month to watch green documentaries, such as I think it was Canadian green documentary called *Garbage!* And the impactful Social/Economic commentary film *Economics of Happiness*. The group also invited local personalities involved in the current Green non-profit organizations in Toronto to speak about their efforts. GN21 also one of the main proponents to initiate Toronto's annual **Eco-Fair at Artscape Wychwood Barns**. This past November was their 12th year of hosting, this time online for the first time, where I was also interviewed as a vendor during the online Zoom Finale event. It was through those monthly community meetings I mentioned earlier that I was introduced to the **Transition Towns Movement** – a recent Environmental/Social Movement originated recently from a smaller southern town in the UK advocating about the reality of 'Peak Oil' and using 'Local Resiliency' to combat the forces of Globalization/Climate Change and to urge how to wean off on Fossil Fuels as a smaller community in the global society. Once again, the **Permaculture** movement was brought up as an alternative to today's mainstream Consumer/Industrialized culture in the Transition Towns Handbook/Manual written by Rob Hopkins, a professor at a University in Totnes, Devon, England.

Volunteering at Permablitzs and in Worker-bees:

In the summer of 2011, I joined a small group of volunteers (mostly young adults) who would gather on weekends from morning to afternoon during the summer months to do labour work related to Urban Agriculture. We would gather together to transform suburban lawns into edible food gardens for the summer ahead with the owners' approval using Permaculture Principles such as implementing 'lasagna gardening' and 'hugelkulturs.' These gatherings were called "permablitzs," and our group was called **PermacultureGTA** led by a black young adult woman in the LGBTQ community. We would usually end our day of work with a hearty group meal/social prepared and organized by the house owner in exchange for the work done. Such group gatherings were not un-

like the old barn-raising gathering days that took place in the colonial settlement era of our country's past, as the older community members told me.

These summer weekend gatherings eventually turned into 'worker-bees' sessions in the autumn and winter months where our small group would gather every Saturday indoors to build small objects related to Urban Agriculture. For me, it was a way to immediately test and realize my design ideas – something that still doesn't quite happen with my architectural office projects. I would design and build objects/furniture in the same week with a few supportive 'permies' - another first for me as I tend to have much trouble attracting good help, even today, in my sole proprietor practice in Toronto.

The Stackable and Demountable Wooden Rain-barrel Stand

I met senior gardener, Mr. Dave Jones of **East Scarborough Community Gardens**, at these 'Open-Space/Safe Space' meetings that took place more than a few years ago now, again through working with permaculturegta.org that connected me with other social activists in an industrial building in East York where the owner wanted to transform the building into a Social/Activism hub and even housing young activists; the only problem was that he didn't want to apply for any building permit applications and 'deal with' the city authorities. It was there that I finally found help from my 'permies' to build wooden objects related to growing food like the wooden rain-barrel stands. Dave was instrumental in starting several community veggie gardens in lower-income apartment buildings in East Scarborough and the community gardens at the historic Cornell Campbell House nearby. Dave invited me to work on my wooden rain-barrel at his storage unit/shop. I think we started early in April, and Dave insisted that we work outdoors on his storage unit's driveway. He showed me how, during the sunny days, even in temperatures below 10 degrees Celsius, we can easily go back inside the storage unit, which I think has radiant heating in the concrete floor slab. Along with a 6-mil vapour barrier and wood frame screen enclosure that he built to enclose the space when the garage door is open to let in light/heat into the space was warm enough to work for a few hours.

I am particularly proud of this final 6 legged cedar or pressure-treated spruce wooden rain-barrel stand. It is demountable into 2 handheld pieces, it lifts a (23" diameter/3' in height) high roughly 450 lbs. (55 gallons) water-full barrel off the ground by at least 11"; and all it uses is just two 2"x4" members at 8'-0" long. Lifting the barrel off the ground will let the wind forces pass under while the stand will grab hold of the barrel even when it is empty so it does not have to be disconnected with the overflow diverter at the end of the growing season. The stand is also stackable to lift a single barrel to 22" high off the ground, and I was able to test the stacked stand at the UofT St. George Students Group Community Gardens by the 'Regenesi Student Group' at one of the student housing buildings on Spadina Ave. in a double-barrel installation. Having the vertical barrel at a

higher elevation will give gravity more force to bring the vertical barrel's rainwater even directly to grow-beds via hoses.

Because of the desire to decorate the vertical faces of the outer legs, I was able to learn the basic skills of carving and used my many years of art (repainting 'masterclass' paintings) skills from my +2 decades part-time/leisure-time at **Lok Tok Art Studio** - first at the home studio of my Art Teacher-dual (father & son) and later in a commercial studio in the suburbs of north of Toronto. Mr. Lok Tok was perhaps the most respected Chinese Art Painter in Toronto partly due to his tutelage under the late Great Chinese Painter, **Xu Bei Hong** in Beijing, the Master at both Chinese Sumi-e paintings and in Beaux-arts/Impressionism style Oil Paintings. This, however, is another story that is deserving of more attention. Through my painting practice experience, I was then able to decorate and paint these small vignettes inspired by the nature sketch-paintings from our Treasured Canadian Artists, **The Group of 7**, using acrylics on the front faces of the outer wooden rain-barrel legs.

The Halved Raised Barrel Sub-irrigated Planter Bed

Dave had a table at a **Seedy Saturday** event; a free public Urban Agriculture Fair weekend event held throughout Ontario related to growing vegetables in spring every year. He designed a low-cost grow-light wood stand for starting seedlings indoors. Dave also started halving extra food-grade barrels meant as rain-barrel cisterns as an inexpensive repurposed plastic planter bed. He would place it horizontally at grade as a planter. We had learned of sub-irrigation planter watering using the perforated foundation drainage piping weeping tile and wrapping it in landscape cloth so that the soil around the pipe/reservoir will better prevent clogging the space in the pipe meant for water. In sub-irrigation, the water can slowly leak out and wet the surrounding soil and the plants' roots above. We learned of this DIY sub-irrigation reservoir planter method from Johanne Daoust and Zora Ignjatovic, who are the Urban Agriculture initiators in downtown Toronto in recent years.

We then tabled at the annual Seedy Saturday next year, where I brought my wooden rain-barrel stand, and Dave brought his half-barrel planter to our booth at one show. Dave made a flat wood frame base that kept the halved barrel sitting on the ground upright. An older lady approached and asked if we could raise the planter so she would not need to bend down to the garden. Dave said we could do this, and the Raised Sub-irrigated Barrel Planter was born.

Office as Workshop for Building Easily Assembled Wood Furniture

In the months ahead, I put my design skills to work to create several different versions of the wooden stands to prop up the halved 'food grade' plastic planter. Several of the other design versions, such as the 'X-Wing' motif and 'W-beam' motif frame designs, were born out of a desire of not wanting to

spend money on buying long pieces of lumber as horizontal continuous structural beams for these support wood frames to lift the earthen halved barrel off ground.

I learned to use the now discontinued IKEA 1x3” baby bed slats for one version and ripped 1x6” cedar fence boards for another at Dave’s storage shop. I had many thinner wood pieces lying around in my office and later figured that I could also easily cut them with just a jig-saw and with some clamps on an un-used drafting table in my small shared office space.

Building ‘cheap’ wooden furniture that is designed to be easily to put together without using many tools has become a sort of a ritual in my small office spaces whenever there is no paid architectural related work; I would keep my creative design ideas flowing this way, building these simple wood furniture pieces for myself at home or for my office space to use.

Dave also experimented with a white barrel as a cold frame. He found that lettuce and kale seedlings were able to grow even when outdoor temperatures were hovering around zero or may even colder (if I recall correctly) with some insulation around the soil inside the translucent white barrel that would create a warmer ‘micro-climate’ as it would let in sunlight inside.

The Rain-barrel and Sub-irrigated Planter Bed Initiative

What if the tens of thousands of backyards/lawns in and around the city are used for growing food? There could be so much food grown that people in their communities may start to share the crops and create stronger communities!

This Initiative is to help promote an Urban Agriculture movement specifically to help cities and suburban dwellers with backyards grow food and collect rainwater from the roof of their houses to water the veggies in a more efficient, low-tech and ecological water-saving way that can even ease the chore of watering plants.

In another way, the goal is to make common the notion that the installations of these low-tech rain-barrel and sub-irrigated planter beds are common features of every urban dwelling with a backyard - just as much as having a laundry or dishwashing machines in the average 1st World households.

The water collected will save on municipal water use, reduce rain runoffs into sewer systems, and that rainwater without chemicals will actually make plants grow healthier and stronger because of a stronger striving 'microbiome' in the natural rainwater! It will help avoid sewage backflow into basements because the sewers and storm underground pipe systems are not separated in the older parts of Toronto with the more frequent and more severe flash flooding in recent years caused by

Climate Change. A mandatory by-law to disconnect the roof downspouts in those areas has been in place for around 10 years now in Toronto, I think.

Sub-irrigated Planter Beds such as raised beds around min. of 6" soil depth formed with perimeter cedar fencing boards 4'x8' in size can have water reservoirs at the bottom of the beds, which can be created by a series of weeping tile clothed with landscape cloth or a premanufactured 'sock' as mentioned previously. A filler tube made from a plastic water bottle is used to fill the reservoirs above the soil. An overflow hole is drilled at the top of the reservoir at the side of the planter bed to tell when the weeping tiles are full of water. The surrounding soil will get wet from the water in the reservoirs by making contact with the water as the plants' roots will suck up by capillary action from the water reservoirs until empty. One can usually tell the reservoir is empty by seeing the soil surface's dryness or by poking into the soil. In smaller containers, simply poking holes in the strong-enough plastic jugs containers that can withstand the weight of wet soil can also work as DIY sub-irrigation reservoirs. These smaller jugs placed in planter don't even have to be connected as water will find its way into the empty containers when one fills the filler tube sticking out from the soil connected to just one of the plastic jugs below.

The main benefit of watering plants from the bottle is that it promotes roots growth. According to the Canadian podcaster at maritimegardening.com, watering plants from above the water level will level themselves out like a strata layer. So unless you are an experienced gardener, you may not be watering all the roots from above as the roots grow deeper and deeper.

One rain-barrel can be easily connected to other barrels via fittings already designed and manufactured by a local non-profit Hamilton group Rainbarrel.ca via hoses and spigot hose connections. They can directly bring the hoses to garden beds with soaker hoses, which have small holes placed on top of the planting soil. And of course, if one wants to exercise, they can turn open the spigot spout and fill a watering can and water manually.

The sub-irrigation reservoir system will ease the chore of watering the plants from 3 times a week to maybe just once a week by filling the sub-irrigated reservoirs. According to a website by some very faithful sub-irrigation practitioners, this method of watering can save up to 60% of water use because water is directly carried to the roots system vs. the convention watering method from above can lose water in evaporation and on the leaves or other parts of the plants above not reaching the roots systems below the soil.

Some critics of the single barrel installation would complain about the barrel's size being too small as it will overflow after just one big rainstorm. As I mentioned earlier, it is quite easy to link barrels via

hoses because water will also fill according to its natural water levelling height. Some would caution that asphalt granules from the typical roof would get into the barrel, not good for the plants even though the diverters come equipped with plastic filtering meshes. Also, the hose spigot can be drilled a little higher than at the very bottom of the barrel, so one can tilt the barrel to empty the asphalt residues as they collect at the barrels' bottom.

The Initiative as a potential re-occurring Summer Co-op Business Venture

The Initiative has the potential to become a re-occurring **Summer Co-operative Business Model** to create student jobs where these students can be managed by adult staff to build and install these low-tech objects, wooden furniture and installations in the many suburban backyards while getting some monetary reimbursements for their work and gaining summer work experience on their resumes. If this initiative is successful in Toronto could even be applied to all the other big cities across North America! All this is in line with the potential to help train a new generation of young food gardeners in suburban communities across the country. On a side note, according to a respected Natural Building Materials Builder Group in Ontario, there is only one worker's Co-op Company in all of North America, that being their group as I heard them talk on Zoom meeting during these months of Covid lockdown. And on the higher building development level, I had come to know around 10 years ago from the CEO of **Options for Homes** Condo Developer in Toronto; their development firm was the only Non-profit Developer in Toronto (or maybe even in Ontario) where their entire staff paid themselves by salary and not by the percentage of the sales of their units sold as profit. This may be a big reason why their condo projects are more affordable than all the rest in Toronto where all the other developers pay themselves a percentage of their sales.

Grow-light Wood Stands and The Grow-light Lantern Bar-Height Table Furniture (on display at my Display Commercial Space at *King Square Shopping Centre in Markham*)

I am also particularly proud to have created the 'Repurposed Lantern Grow-light Furniture' by designing and placing a wood frame inside with clear Plexiglas shelves and using LED strip grow-lights with adhesive backing for growing seedlings indoors. It glows pink from its blue and red lights, which promotes green leaves growth and creates an environment for seedling plants to be transported to the outdoors in weeks. By using grow-lights one can extend the growing season in our cold climate Toronto. This repurposed plastic barrel furniture came about accidentally. Through social media, I learned of this beer malt making lab for Ontario's micro-breweries was giving away many of their blue coloured 'food-grade' barrel in Guelph. In Kijiji Toronto, people would sell them for around \$20 each as garbage. I was able to fit 3 in my subcompact Ford Focus hatchback when I push my passenger side seat all the way up with its back tilted fully forward to the windshield on my

first trip there. On a subsequent trip, I requested if it is possible to leave 3 blue ones outside their parking area so that I can pick them up after 5 pm on a weekday. They left me 3 white barrels instead. The white ones were not good for rain cisterns because they let in ultra-violet light, which encourages algae growth near top of the water. When I brought one of them back to my living space next to my counter kitchen light, the barrel would have a white glow. It reminded me of those attractive ‘lantern beacon’ architectural features on top of buildings we would design during my Architectural school days in the 1990’s. So, I wanted to put grow-lights inside to make the white barrel glow as a table/furniture piece since it stood 3ft high as ambient lighting for the indoors at night. I found the 8’-0” long LED strip lights with adaptor/ballast set at Lee Valley. It took several design versions to finally come up with the idea to make a hole at the barrel’s top so I can swivel out a plywood tabletop to access the inside of the barrel.

The newest version has a self-standing wooden frame with Plexiglas shelves at various heights inside the barrel to move the plants around as they grow taller. I even cut a circular ‘full-moon’ motif at the front middle to access the lower plants near the bottom of the barrel. In the past few months, I set up a permanent display space showcasing my Urban Ag. related designs. My latest small design project is to use reclaimed lumber or scrap leftover pieces of wood in my office/workshop to create these grow-light stands and to also create these almost Buddhist good luck turning ‘lazy Susan’ pedestals for my smaller repurposed plastic planters. All this possible because of these cheap available and powerful/bright Chinese mid-range colour temperature LED tube lighting I can find in the Scarborough and in Markham.



Figure 1 repurposed wicking plastic seedling planters

Repurposed Sub-irrigated Planter Pots

I realized I could repurpose the 2L pop bottles into lotus shape flower petal planter pots some with or without sub-irrigation by cutting symmetrical flower petals, as Architects I knew that the plan view is the ‘generator’ for many of our 3-D designs. I also repurposed, first gesso-ed then painted, various Palmolive dish soap bottles with dark nature scenes such as night cityscapes and a blue & white porcelain like one

with Venus De Milo. I called these the *Repurposed Chinese Plastic Planter Vases*.



Figure 2 the Repurposed Palmolive Dish Soap Bottle Chinese Vases

Natural Carbon Sequestering Materials and the Urgent Need to ‘Fix’ Our Soil

I learned of natural organic materials such as hemp, straw and wood and their ability to sequester carbon from a Ryerson student I met at the **2017 IT Expo** held near the mouth of the Don Valley Parkway and Lakeshore where a built Net Zero prototypical townhouse suite was showcased. It used mostly natural materials and was a joint design-build between Ryerson staff, students and the **Endeavour Centre** group in Peterborough (a hands-on all-Natural Building Material Resource and Training Centre). Because during the lifespan of plants, they would absorb carbon from the atmosphere and absorbed carbon is kept in its living fibers even after it is cut from the ground. The living plants will also pull carbon from the atmosphere into the soil. I think it is when the organic material is burnt then most of its stored carbon is re-released back into its atmosphere. Human-made materials such as steel and concrete do not sequester any carbon this way and actually take a tremendous amount of ‘embodied energy’ to make; now there is even the term ‘embodied’ or ‘upfront’ carbon being brought to our design community’s attention, which includes the associated carbon of the material such as in its travel to the building site and how the building material will end up in our environment must need to be considered also.

I learned of the need to repair our North American soil by watching and participating in the worldwide free online event **World Localization Day** Summit hosted by The **Local Futures** group led by **Helena Norberg-Hodge** of the film **Economics of Happiness** (a political/social activist from Sweden and educated at M.I.T.) joined by Noam Chomsky, Jane Goodall and many other compassionate vocal Social and Environmental activists like George Monbiot, Charles Eisenstein and Vandana Shiva and even musician like Brian Eno, in June this past year. It was at a Zoom talk event with **Dr. Zach Bush** where

he mentions the importance of a healthy microbiome in our body (gut) and in the environment where the food is grown similarly supported by a diversity of life required in our societies for bringing about a natural healthy habitat. He would link the rise in deadly health deceases such as cancer in our Modern era to the lack of a 'healthy microbiome' in our soil since the use of chemical fertilizers, pesticides and herbicides after the First World War (these chemicals were created as poisons) and from Industrial Revolution and the mono-culture agriculture farming techniques employed which has hardened and made the soil lifeless. As we can still buy 'Roundup' spray bottles at the suburban TO Home Depot in their gardening section this spring. To eat healthy organic food grown locally, we must repair the soil first, says Dr. Bush. Also, during the summit, the new green documentary from Australia called **2040** had a segment with a well-meaning urbanite young family moving back into the country areas to establish an organic farm and under the advice of a seasoned commercial farmer turned-organic farmer because of a massive fire that burned down his industrial facility years ago. They learned of 'companion crop end-of-season planting' at the end of the growing season on their fields by planting, I think it was, 18 different crops together to revive the 'microbiome' of the soil where in just one season earthworms in the soil will then reappear.

All the Other Good Things Will Bring By Way of Urban Agriculture

I am now a contributing writer for almost half a year now with the online newsletter with the **Toronto East End Climate Collective** in East York, where I share my efforts, including some homely videos on how to make DIY egg carton eggshells seed starting trays and also how to make your own stacked yogurt and margarine plastic worm compost tubs for those in smaller apartment urban dwelling units. In the last article before this new year, I wrote about all the un-intended good deeds that would come about by taking on the act of Urban Agriculture such as composting at home, repurposing all those plastic ware we all have too much of and even meeting my neighbours by approaching them to see if they will take my plants later in the season to let them grow on their South facing balconies.

The article's link is here:

https://docs.google.com/document/d/1TjiNmo2zqcpVjng46hbcmSVHcJ_mCcSZ-00IzrD16rk/edit?fbclid=IwAR1sg5aHOzaBI5g-5WGA01pFAkfBVmSgM9WJ292APqF-z7l9h_ajENSwgDs#heading=h.htx6b3vqttvr

My Repeated Failed Attempts at Reaching out to The Community At-Large

I have approached numerous community organizations both in the Chinese community and in the mainstream TO Arts and Culture related organizations for about the last 5 years and was even invited to the City of Toronto summer ideas granted application meetings last spring. So far, all they have responded that they are looking for more 'Arts&Culture"-related Initiatives for the summer months of that year.

However, I am hoping this 2021 post-Covid growing season, there would be a change of heart for the efforts of promoting Urban Agriculture and seeing its importance for the community and the environment at-large in the context of our big Urban Concrete Jungles. And of course, not to mention yet again that all the good things that will surely come along with learning to grow food.

For more info on my design and initiative for the cause of Urban Agriculture is here:

<http://www.lowelllodesign.com/things-permaculture/>

And a good essay on why the need for more farmers again in our Modern Industrialized society Richard Heinberg (author of many Climate Change books and a fellow at Post Carbon Institute)

<https://www.resilience.org/stories/2006-11-17/fifty-million-farmers/>

Toward an Age of De-carbonized, not just Design Driven, Architecture

Do we need to cantilever building floors where we will need to use more steel structure and then apply a 'diminishing return' of extra insulation for their exposed lower form, especially when they are living spaces like bedrooms, to make the building form look cool? Or keep building underground portions of buildings as basement storage or parking levels that require tremendous use of cement, excavation and, of course, waterproofing. The crux of the issue now is that the entire world follows this method of the ever-so-strong Roman tradition to build our Modern buildings in every corner of the world. Quite evidently now with Scientists and Environmentalists warning this way of building has polluted much of entire planet and caused Climate Emergency. My green employee grant for a Masters Graduate Intern Assistant from Mumbai, India, confirmed this fact, where according to her, the entire city is built using concrete only. This may be why India burns so much coal to use in those giant arc-furnaces to make cement and maybe similarly in China in all those mega-cities with many high-rises that have been polluting their air quality. On a side note again, she was another rebel millennial assistant not interested in learning green building details or learning the traditional techniques of designing buildings.

Do we need more skyscrapers with little chance of bringing natural cross ventilation we now want in post-Covid time? And when they are residential towers; are they just not 'vertically gated communities' where the public in the neighbourhood can't even enter, and then that majestic looking building is destined to do nothing more than newly gentrifying its neighbourhood? Is it impossible to dream up mid-rise podium roof areas as shared public spaces such as outdoor marketplaces to invite the surrounding public to see their nice elevated roof-top views as public spaces? Would you agree that when there are no new public spaces created in these vertical towers, then the project's intention will be mostly just about fitting as many units as possible under the given zoning by-laws? Would it then just become another mere design exercise mostly on architectural aesthetics?

Is it not possible and better for the health of people to build low-laying earthen cell-like dwellings that are 'of the earth' that can form courtyard spaces both enclosed and not enclosed by repurposing the ubiquitous shipping containers and having them insulated outboard (with a combination of rammed earth and natural wood fiberboard insulation now) to protect the conductive metal thin shell that would not be cut so openly where you would then require at the very least wooden framing to prop the steel shell back up? Will the earthen floors not provide 'thermal mass' through passive solar and give a 'negative ionized charge' that is beneficial to all living beings on earth when you walk on the planet called: the earthing or grounding charge? All this already demonstrated by a new generation of Rammed Earth residential builders in North America and in Ontario that when this ancient construction is combined with Modern Technology with a Styrofoam 'thermal break' in the middle, it is proven to work even in our Cold Climate where its thermal mass quality can be enhanced also. Also the last benefit I heard related is the 'hygroscopic' quality of earthen soil; that is, it can absorb moisture and re-release it before purifying all that captured moisture first when the interior spaces are exposed to the earthen surfaces?

Is it not time to ask hard questions like do we as designers keep striving and espousing for the 'knives-edge angular conductive metal-clad armour form' as the default ideal architectural physical manifestation (in our Cold Climate) for the rest of the world to follow? And do we keep accepting and using the latest technology such as spray foam insulation that now claims to have almost zero GHG emissions from its gaseous blowing agent even though it is a human-made chemical that must have required much 'embodied energy' to make than to use natural carbon-sequestering insulation such as wood fiber or hemp which is slightly lower in their insulating value? How about the new 'Mass-Timber' tower movement that looks like many large enough trees even though they will probably not disintegrate like those engineered 'I-joists' in the event of flooding inside the building. Or maybe it's the glue technology that has also advanced so much that its adhesive can now last up to one hundred years even when submerged in water, as I learned from the sales rep. from the 'High-Performance' Building Air Barrier Supplier from Germany recently. There may also not be any more formaldehyde in this super-glue formula now; but how much embodied energy did it take to create this human manufactured concoction?

Are we to keep knocking down 'non-structural' walls for our clients to open and connect their interior spaces without any columns or 'shearing walls' and replace all the wood frame members with steel beams and columns, which may sometimes require a crane to drop in place at the site? The lessons of old Asian temples with their 3-D dimensional frame structure that would keep the building rigid without continuous foundations or any large beams where (as I learned recently from PBS NOVA) the large wood columns are not even anchored to the stone foundations in the temple, that can withstand strongest earthquakes are still not desired? I also indirectly learned this from attending the **Annual Ontario Natural Building Coalition Conferences** near Peterborough as a straw-bale builder from Guelph

presented and noted that their one storey wood frame straw-bale classrooms buildings would only require concrete foundations when their structures are being placed in big cities like Toronto or Ottawa where those permit departments would require the over-engineering!

Is it not time to complain about Engineers' role dominating in the field of Architecture because anything with concrete and steel requires an Engineer's stamp, not an Architect's? Not to mention that along with BCIN designers, many of the Interior Alterations Projects in the form even permits submissions can be made by all these 'other' design professionals, not just Architects in Ontario when fire requirements are adequate or unchanged in existing buildings? This applies to existing Part 3 buildings of any size also. I will stop ranting about this problem for registered Architects in Ontario now as this is not the paper's theme.

Are we going to keep designing single-family dwellings in the Modern Idiom with flat roofs that allows for lower insulation values because of Modern aesthetics reasons? Have we not now realized that natural cross ventilation in houses should have been a must by way of some exterior courtyard-like space? This is not achievable because of the lot size portions in North America that do not follow the Courtyard Housing configuration which is inwardly based and more compacted. How about also realizing the importance of having 'Common' Architectural spaces, especially outdoor ones, can bring about a sense of community even though these are inanimate spaces? Like those older, almost Social-Housing-like typology precedents may be in the UK built in the '50s and '60s, there would be ungated grass-lined courtyards spaces or paved pedestrian walkways that are shared and surrounded by groups of row-houses. The walkways could easily be further enhanced into more common-like garden spaces. You can find a few of these less formal housing designs with courtyard typology in the older **Don Mills** area of Toronto, where the developments would push their parking to the edge of the property under the roof of a long carport structure or with none at all and the spaces used for individual driveways in later developments are instead public shared pedestrian spaces especially for kids to play in and not as driveways. But would a 1900's worker style row-house development like the Bain- Co-op in Riverdale sell where the developer may not be able to make a big enough profit with the development that lacks in architectural features or convenience?

In those first Canadian suburbs of Don Mills, where the houses are smaller with their open carports not way more charming in terms of having a sense of connection with their neighbourhoods and, of course, less materials used than enclosed garages. Is the carport's space is not useful and comfortable to use as space in the warmer months when the car is not occupying the space? Don't you even feel better when you can have glimpses into one's backyard where the light is shining through as you walk by these houses? But will that sell as a 'private' (word with Latin roots meaning to 'deprive') property 'to own,' especially to the 'nouveau riche' new immigrants? I did try three times, mostly with older settled Chinese clients, who wanted to build garages in the older areas of Toronto, and I would try to advise on carports instead.

Still, they would all eventually give up in the application process because, if I recall, the by-laws correctly for garages/carports were stricter than the setbacks for the leading houses in Toronto. None of the clients wanted to go through C. of A. That was more than 7 or 8 years ago, I think may be at a time when the city didn't want additional garages in those downtown areas?

What about that very high percent of **Single Family Dwelling Zoning** areas in all of Toronto as mentioned in the book by the local Urban Planning Activist in Toronto: '*House Divided: How the Missing Middle Will Solve Toronto's Affordability Crisis*' I got at the Spacing Magazine store? The book highlighted the example of the area around Sheppard Ave. in North York surrounding Yonge St to be the classic example of this Zoning inadequacy. The site has Single Family Dwelling Zoning up to these many very shallow lots off Sheppard. Hence, no nice European style inspired Mid-rise Housing typology can be built along that long prominent Boulevard.

Back to Climate Change, according to recent CBC news articles online; is Canada the **2nd most intensive usage of Fossil Fuels per capita** in the world in recent years behind Australia, where I think they supply much of their Fossil Fuels, including much coal (perhaps for making concrete) to emerging global powers in East Asia. Is it also not related, as I learned from detailing residential additions over the years that when the two widths ~8" wide masonry exterior walls were replaced by hollow wood stud back-up walls with fiberglass where there is an inch of air space creating a convective current behind the single brick veneer with weep holes (a pressurized space to the outdoors) that may cause much heat-loss through constant 'air-leakage' in all of the suburban houses around our big cities across the entire country? And to heat those leaky single detached homes with large surface areas that have been growing in size ever since, we will need to keep depending on our inexpensive natural-gas which is mostly methane (100 times more potent GHG as CO₂ as I recently learned also)? And not to forget, all those metal clad glass towers that are also tremendous heat-loss in our **Cold Climate** winters and then even needing A/C from the much solar gain especially when the building façade is west facing during the summer months? As we all know that the **window to wall ratio** will get even less than the current 40% for residential towers as we approach 'Net-Zero' Building requirements by 2030, or is it by 2050 now?

It is not through the realization that when designs and environmental destruction are interconnected then will 'Designs' in general be more than just one-dimensionally driven – for the pursuit of visual aesthetics that has been at prominence in the Modern Industrial Era; as I call out to all the designs professionals in Ontario now includes Architects, Engineers, Interior Designers, BCIN Designers and Technologists? I will end to go on record to say (as an un-acknowledged) sole proprietor architecture practitioner for ~16 years in Toronto that Modern Architecture in Ontario has been mostly just high on embodied carbon and low on complexity. It is not the right time to dig deeper into the phrase of 'Less is More'.

Please see my video submission for various sustainable and 'low-tech' architectural concepts/solutions in our time of Global Climate Emergency, which I believe can work, as I type this, the Livestream with **Greta Thunberg** and **The Holy Dalai Lama** and other top Scientists just ended this weekend about the **Feedback Loop Effects** of Climate Change is accelerating faster than previously predicted by Scientists.

Very Lastly, I have two very recent Watercolour Paintings (one of which was awarded the Award of Merit) with the subject of Trees on Display on **Toronto Watercolour Society's** Current Exhibition webpage here: <https://torontowatercoloursociety.com/current-exhibition/> (on page 2 of the webpages)

And please do drop by at my Display / Workshop Space that I constructed mostly by myself at **King Square Ltd. Shopping Centre** in Markham this coming 'no-more business as usual' the new year 2021 and see my design efforts for the cause of Urban Agriculture.

