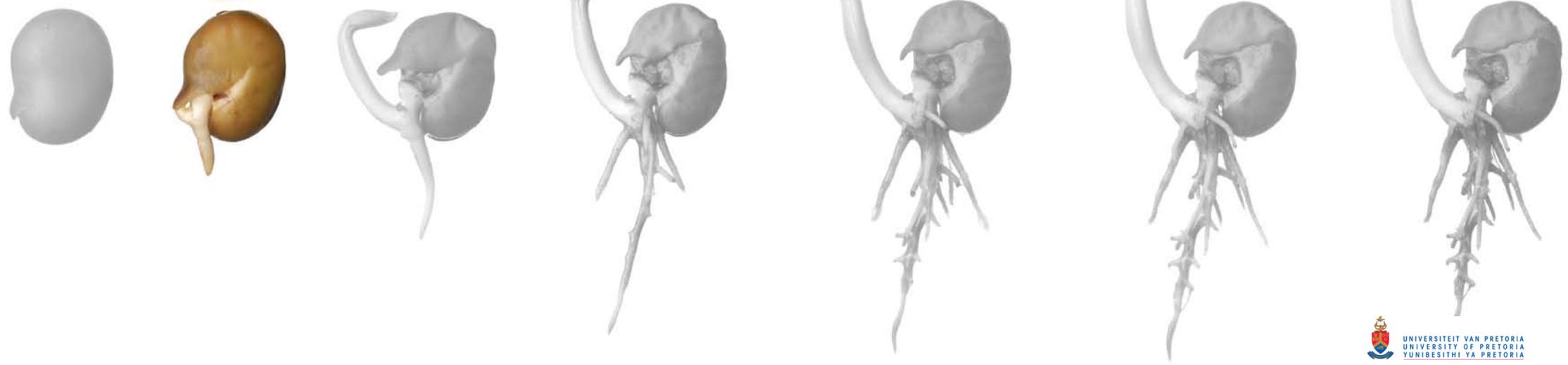




theoretical discourse



2.1 Credo

2.1.1 Community relevant architecture and social responsibility

Fourteen years after the liberation from South Africa's Apartheid regime, the country is still hampered by many economical and sociological problems. One of the most serious is the HIV pandemic and the effect it has on impoverished communities. South Africa has also been witness to an astonishing rate of urbanization since 1994, and this has placed enormous pressure on the economy and infrastructure of cities. Vast numbers of people are unemployed and as a result many of them are living on the breadline. Together with the abovementioned factors, the unpredictable natural climate of South Africa and the impending recession in many global markets are also placing a lot of pressure on the local economy, with rising interest rates and escalating fossil fuel costs ultimately affecting food prices directly.

In a recent study published online by Siegfried (2008:2) on the Integrated Regional Information Network (IRIN), a humanitarian news and analysis service of the United Nations (UN), it was shown how many people in South Africa are dependent on charitable associations like the Nanga Vhutshilo Positive Living drop-in center in Soweto, Johannesburg. Many of these institutions are orphanages providing meals for families (mainly children) who have lost their breadwinner as a result of HIV/AIDS.

One of the current problems that result from population growth and changing diets in developing countries such as South Africa is a drop in the food supply. This has developed as a result of erratic weather fluctuations, increased fertilizer prices due to inflation, and the percentage of agricultural land now set aside for the biofuel industry. The rising food costs are exacerbating an already difficult problem for charitable organizations, which are unable to provide enough food for people who are already dependent on them.

As a country where secondary industries are underdeveloped, South Africa has also seen its currency gain strength against larger currencies such as the United States dollar. This has reduced the prospects for exporting primary products such as maize and wheat leaving farmers with a large surplus of food supplies that can not be sold on the local market for a high enough profit to cover farming costs. Many farmers have thus opted for setting aside their farmland to pursue biofuel production that guarantees a much more stable revenue.

What role has architecture to play in all of the above-mentioned sociological issues? With the number of people living in cities at this time being higher than ever, many new initiatives and projects proposing the introduction of urban agriculture have started to emerge in developed nations. Addressing the issue of the global food crisis directly, multi-functional office and residential buildings make use of the most current greenhouse technologies and incorporate them within the building envelope. A project such as the vertical Skyfarm (Fig. 2.1) in Toronto, Canada is predicted to provide enough food for the population of the entire western side of the downtown area. Other such projects include La Tour Vivante in Rennes, France (Fig. 2.2-4). Here, the architects conceived the building as an "...*autonomous ecological machine*..." (Jodidio, 2007:94) where internal greenhouses serve as a link between different building functions such as offices, retail and residential.

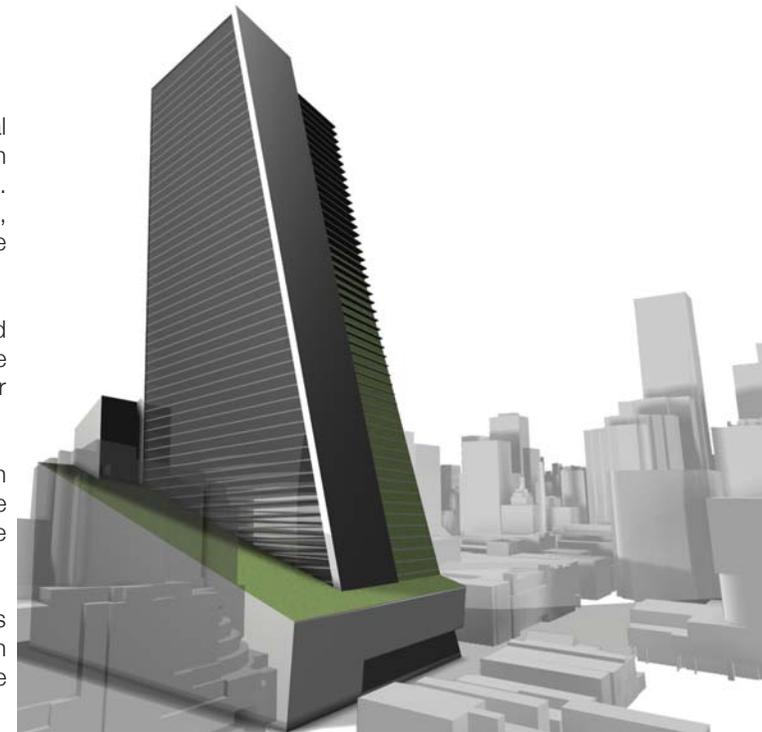


FIG 2.1 Skyfarm building, Toronto, Canada (Alter 2007:1)



FIG 2.2 La Tour Vivante, Rennes, France (Jodidio 2007:95)



FIG 2.3 La Tour Vivante, Rennes, France (Jodidio 2007:97)



FIG 2.4 La Tour Vivante, Rennes, France (Jodidio 2007:96)

In a recent article in the Science journal, Clery and Vogel (2008:752) discuss the feasibility of such projects. The predicted outcome of vertical farms promises that they can produce more food than current traditional crop production at a fraction of the cost. Well-designed greenhouses only use up to 10% of the water and 5% of the land required by traditional farming fields. Initially the costs involved in urban greenhouses can exceed those of traditional farms, but as fuel prices are on the rise and greenhouse technology becomes more readily available, the prospects for urban greenhouses appears to be more favorable due to the possibility that transport costs can almost be eliminated.

As a further premise of economical feasibility for urban farms, the water and “soils” used in a hydroponic greenhouse system are to a large extent completely recyclable. For example, the rockwool fibres commonly used in hydroponic greenhouses are costly to recycle and undesirable to be used as landfill material. A Canadian company, SRI Petrochemical, has developed a cellulose type of rockwool material that can be re-used several times by utilising conventional recycling technology (Brodie, 2006:1).

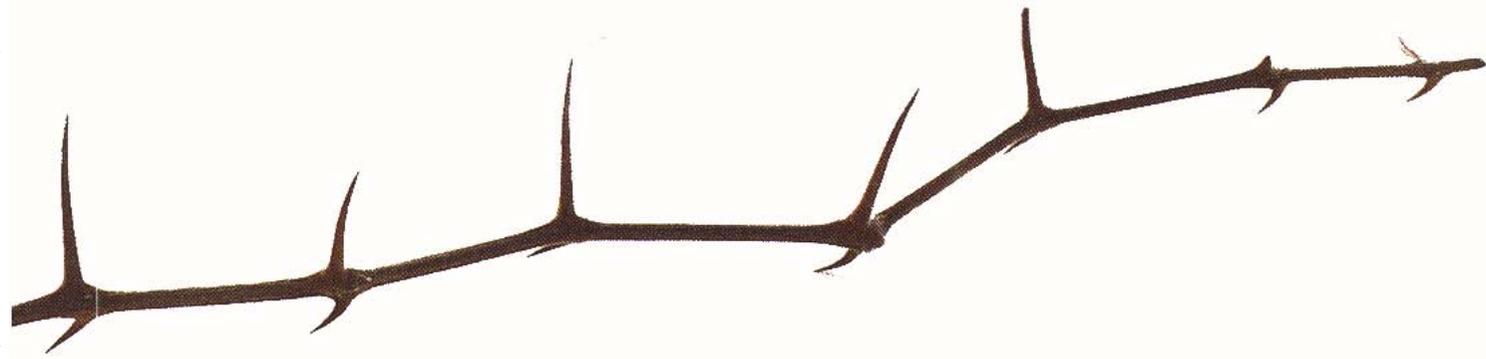


FIG 2.5 Buffalo thorn tree branch, *Ziziphus mucronata*, significant symbol in Nguni African legend (McCallum 2005:3)

According to Clery and Vogel (2008:753), there are many favourable predictions for urban farming. But its Achilles’ heel, when it comes to promoting the paradigmatic change away from traditional farming that it can bring, lies in the fact that more research needs to be done in order to convince the authorities that it represents a step forward. Comparatively, as with years of aviation and many aircraft incidents later, each accident has provided a platform for “lessons learnt” for the future of aviation, resulting in the safe flying conditions that exist today. Clery and Vogel propose that hydroponic urban greenhouses can prove to be beneficial for the developing world, and in sub-tropical regions such as South Africa the availability of ample sunlight makes the possibilities even more promising, as the use of greenhouses can give worn-out soils a rest. The recycling of human waste as nutrient supplements for plants is also a possibility, with the appropriate technologies already available. Professor Jan Broeze, an agricultural scientist at the University of Wageningen, reinforces the above by stating that, in order for the concept of urban farming to succeed, a remarkable breakthrough in hydroponic food production technology needs to be achieved, and universities need to conduct tests with various plant specimens, genetic modification of seeds, and various growing-out techniques.

It is therefore inevitable that, in areas where the global food crisis is having an impact, universities will have to develop facilities and research centers to encompass and develop the relevant technologies as stated above. This will allow universities to be socially relevant as institutions and supplement initiatives such as urban farming in order to positively impact communities and fight global poverty.

2.1.2 Architecture and metaphysics

A research facility on a university campus runs the risk of being planned as a completely utilitarian compound only fulfilling the needs of the research functions being conducted there. If the goals of a possible University City - as discussed in Chapter 3 - are kept in mind, the fact can’t be ignored that university faculty buildings need to become architecturally more responsive towards their environments and need to entice participation by the local community.

How will this type of architecture respond and what kind of architectural fabric needs to be introduced? Joe Noero (2005:8) states that in order for architecture to move forward one has to recognize that it has to grow from the *needs* and *expressions* of the man on the street, in order to claim for itself the title of public art. The above looked at what the most urgent needs of a community in a developing country such as South Africa are, but what kind of architectural expression is being referred to? Should designers express the character of individuals in a society that are intrigued by the stories of Simon Veil and his memoirs on surviving the Holocaust, or is it the function of designers to just fuel a consumerist society’s appetite, and prickle and stimulate the senses of a majority that is already numbed by artificial food flavourings, entertainment and the media? This is what Peter Zumthor refers to when he says that:

“...everything merges into everything else, and mass communication creates an artificial world of signs” (text quoted from the writings of Peter Zumthor in Burns, Quiros & Repp, 2001:2).

Arriving at an architectural design morphology involves a constant process of finding the balance between the physics and the meaning it will give to the area in which it is erected. Physically, architecture is a parametric entity built within context, and relying on building technology and human ingenuity to follow to the rules of physics to shelter its users from the elements. The interior



FIG 2.6 Eames Aluminium side chair, part of the Eames Aluminium group designed by Charles and Raye Eames in 1958 (Conran & Bond, 1999: 113)

and exterior spaces a building must provide are mainly program driven, depending on building typology and user needs. Animals and plants, on the other hand, can transform their bodies in response to their needs, adapting to environmental changes and movement or locomotion (Badarnah *et al*, 2008:147). Robert Aish (Aish & Menges, 2005:53) notes that the essential abstractions that designers need to employ during the design process are geometry, composition and algorithmic thought.

Addressing how different people perceive the building envelope or experience spaces comes down to the same dichotomy of finding a balance between the rational and irrational experience of space. People are different, geometry differs and spatial parameters or characteristics differ. Designers need to create structures that are not just utilitarian, but provide an experience, a metaphysical state of awareness. People are intelligent beings, but they are also spiritual beings with arguably the majority believing in a Creator, a supernatural governing energy or God. They write poetry and paint obscure lines on canvasses to express their emotions and thoughts. Please see Table 2.1.

Buildings have a remarkable similarity to plants in the sense that they are static objects containing dynamic processes. Plants must deal with attacks and environmental constraints that surround them. Plants stay static in one position and have therefore over the millennia intuitively evolved exceptionally intelligent methods of manipulating everything around them in order to survive.

According to a legend of the Nguni African tribe, the thorns of *Ziziphus mucronata*, more commonly known as the Buffalo thorn tree (Fig. 2.5) that has young twigs that zigzag across the branch, teach man something about himself: that he must look ahead to the future, but must never forget where he came from (McCallum, 2005:3).

This is who man is. He will always try to find ways of communicating his deeper thoughts through the objects of everyday life.

Ian McCallum (2005:56) proposes the idea that there has never been a golden age of ecological symbiosis between humans and nature, but rather that humans are evolving towards an awareness of ecological intelligence. He refers back to the idea that humans are animals and that they are earthly beings who came from the earth and will return to it again. All humans carry their history within them and they are a mindful, poetic species who are keepers of their zoo. He argues that humans have become creatures of their own undoing. They have placed themselves at the apex of creation and should come down from that peculiar pedestal. McCallum also enforces the idea that although humans are biological beings, they are also psychological entities, acknowledging the study of the conscious and unconscious that makes up human nature.

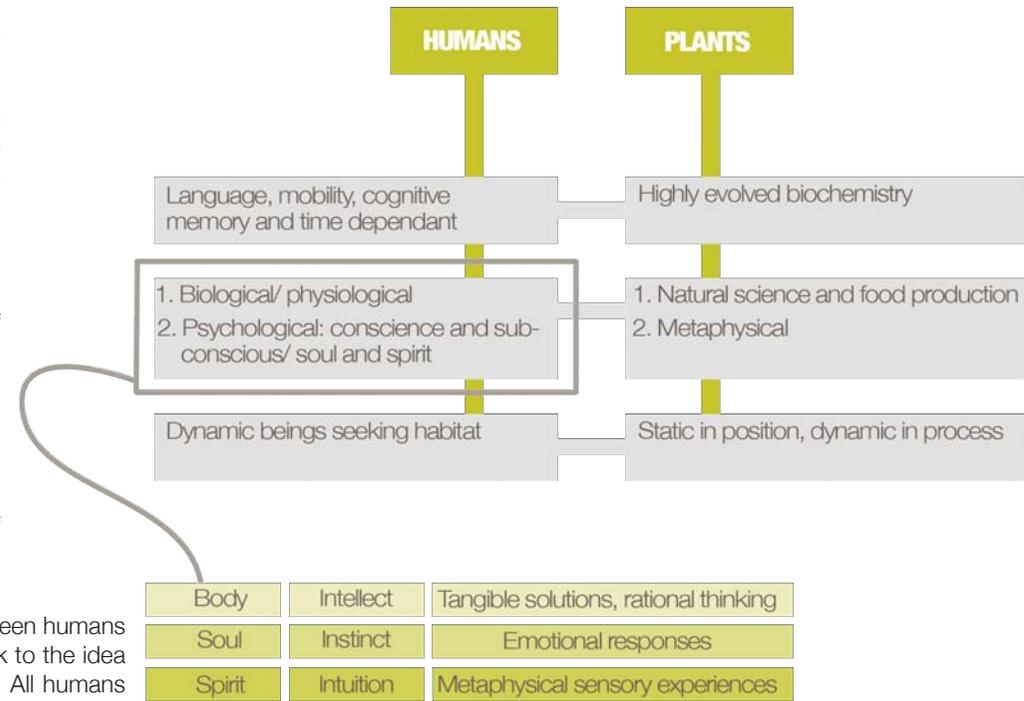
One of the concepts he expounds is that if humans are serious about rediscovering themselves in nature they need a language that speaks for science and soul, a language that narrows the gap between subject and object, a language that reminds them of where they have come from and what they have to do to be ecologically intelligent. In his opinion, poetry has always been successful at bridging this gap.

Similar to the thinking of McCallum, Michael Pollan (TED, September 2007) also acknowledges that humans have to change their relationship to the natural world and look at the world from a plant's perspective. Organisms such as humans, insects and animals have the grammar of self serving conceit in that they are sovereign subjects whereby each is getting what it wants from nature. This is a typical Cartesian mode of thinking, that one species dominates another and that by the intelligence that plants gathered over a long period of evolution they are cleverly manipulating other organisms in order to help them germinate and gain territory. According to Pollan, humans think they are suppressing grass by mowing it, but in actual fact they are helping it to succeed in out-competing trees and preventing forestation.

Everything that humans design should not be dominated by conscious thought only.

In an interview some time ago, Swiss architect Peter Zumthor (Perkins, 2002:48), who is noted for aiming to introduce metaphysical experiences within his buildings, explained that if they work well, buildings become beautiful and the spaces contained in them are beautiful to live in. The beauty of a building should contribute to the beauty of a place. He stated that nature is always beautiful. It doesn't matter what time of day or what region it is, nature is always beautiful. Architecture

TABLE 2.1 A comparison of human physiological, plant biochemical compositions and the similarities/differences of how they integrate within their environments. Collectively compiled by authors own research in McCallum, I. 2005 and Pollan, M. 2007.



nature and the beauty of the site and must enhance this beauty. Although the purpose of architecture is to be functional and to provide people with shelter, it shouldn't obviate the beauty of buildings. He compares buildings with chairs (referring to those by the revolutionary product designers of their time, Charles and Ray Eames, Fig. 2.6) or drinking glasses, which by definition and purpose are utilitarian objects. But they become objects of everyday life and the beauty of their form develops according to their nature. Zumthor mentions that good architecture must be good all the time, whether it rains or the sun shines. It must be good under all conditions, just as nature is. He goes on to say that architecture should be like nature, but when it starts to alienate itself from its functional use it isn't natural anymore. Creating architecture is an emotional response and one interacts with objects because one experiences them:

"But there is always a strong emotional part, so the way I work is of course that, at any point of the design-construction process, we try to feel it. That's why I have to produce images in my mind and in the minds of my collaborators. Any time we work on it, we have an image of how it looks. Then it's easy to react on it, because the emotions, they are fast. Emotions are immediate. This is really the instinctive part. It's sort of being intelligent about your feelings" (Perkins, 2002:48).

2.1.3 Sustainable design

In the author's opinion architecture has always been sustainable. It uses appropriate available technology, builds with products from nature, and results in places for man to dwell. Buildings serve as recreational, civic or gathering places for communities within a larger community, confined to a certain landscape. Today we realize what the global impact of cities is, but the process of urbanization that established them

has been a natural occurrence for centuries. Therefore, green buildings that use energy efficiently only tackle the issue of resource efficiency and may become a trend or stylistic approach, as is already the case. They are merely symptoms of a larger problem. Architecture has become technology driven and showcases human accomplishment, restraining the forces of nature in the process. Quick building developments are merely quick fixes for immediate pressing problems, resulting in quick sociological disasters. Man's dominion over nature is currently being enforced beyond measure and results in environments that have become socially segregated, economically unstable and visually fractured.

With advances in building science, architects are confronted with three phenomena, namely: technology arrives by design, is applied by design and, in its form and use, technology itself designs (Fry, 1999:23). According to Dormer (1999:141), a building is a kit of complicated parts and "...wherever possible, methods of building are employed in" which the know-how is embedded in the system rather than individuals..." He believes that "...designers and architects could be replaced by managers whose job it is not to invent but to manage the use of existing systems". This ultimately leads to the realization that "...technology has become so predictable that it's aesthetic is predictable, even boring" (Dormer, 1997:142).

Any approach to sustainable development will not be solved by only using new sustainable technologies that have not yet stood the test of time. Sustainable building technologies should serve on an equal and parallel basis with social and economic sustainability. This will, in the author's opinion, result in integrated socially equal communities such as the Lynedoch development. Please refer to Chapter 5, Heading 5.5.

In high-density urban areas, money and power are the ultimate ruling ordinances. More specifically, large corporations and institutions rule our cities. According to Malan quoted by Louw (2006:2), Corporate Social Responsibility (CSR) refers to responsible corporations that want to make a real difference and a lasting contribution to the countries and communities within which they operate. Sustainable corporations to social responsibilities as well as to environmental inte



FIG 2.7 BP headquarters in Greenpoint, Cape Town

A local example where CSR is being applied is the new BP (British Petroleum) headquarters in Greenpoint, Cape Town (Fig. 2.7). Apart from the most obvious fact that BP is one of the largest fossil fuel companies in the world, they apply CSR globally in creating sustainable and ecologically responsive buildings for their office staff. The architectural response by KrugerRoos was what Eric Noir in Darroll (2003:30) calls a *framework approach*: to establish intuitive and sustainable design principles within the surrounding urban framework, and to ensure that the building evolves as a response to these principles. Noir also states that the “environmental considerations are deeply integrated with the urban design and architecture – integral rather than add-in systems”.

2.2 Deriving an architectural normative

Archetypes of nature

Stimulating human's sense has a profound impact on how we perceive the world around us. Enhancing elements within the building such as water, light, smell of natural materials and vegetation can evolve into archetypes of nature than transcends the users mind to a place of positive memory (Forests, mountains or places of similar experience). The author believes that stimulating these senses allows people to experience buildings on a level that starts adding meaning to everyday objects. Stimulating senses through archetypes of nature provides a platform that can allow people to become more aware of a different state of mind, the subconscious, which will allow the place created by the building fabric to become a place for spiritual contemplation.