(WHAT WE NEED TO GET THERE)

A STORY OF SYDNEY BY MICKI AAEN PETERSEN

Are you stressed or burned out? You are more than welcome to take a tour through the garden and try the garden therapy yourself.

A fictional story about the future quality of life and the transitions needed to get there – told from an urban climatologists point of view

By looking through the curved flat---panel display that makes up the airframe structure in the sides of the plain, I have a 360 degrees view on mother earth from the distance of 10,000 meters on my way from Copenhagen to Sydney. On my many flights looking out through the atmosphere has always fascinated me. To observe how climate affects life on earth, the clouds that cast shadows of the sun and affect the climatic condition on the earth's surface. The dynamic and constantly changes of the climate is wonderful. It gives people a sense of time both on a daily and seasonal base, while at the same time the climate makes us aware that we a apart of a larger solar system.

I some way I am miss the tiny oval---shaped windows. Back then I always made sure to book a window seat to get the chance to look out. Looking through the two layers of transparent plastic, focused on one particular view was somehow more realistic. When I'm now looking through the big curved screens, I cannot stop thinking if it is just a movie they have put on from the automatically controlled cockpit. ---As a marketing stunt, just to make the passengers feel comfortable, and to ensure we will book our next flight with them. Despite my lack of confidence, I'm pretty sure that I would have booked an "adventure ticket", if money were not an issue. People sitting in the adventure seats, wear a helmet (that initially was developed for the pilots of the jet fighter F35) with multiple cameras placed outside the flight to ensure that people only see the real nature every time they turn their head. Just like their eyes were flying all alone in the universe.

I closed my eyes and imagined the feeling of my sight being exposed to the sky instead of seeing the middle class family sitting left to me; A scene where the mom continuously confirmed herself that she was looking like a girl at 22, while the teenage son ate candy, played videogames and tried to connect with his overweight father who didn't talk because he was busy by emailing the office. Meanwhile I were getting excited to visit my grandchild Robert and his newly established family in Sydney.

I remember myself being exactly the same age as Robert and I read a thought---provoking story in Naomi Klein's book "This Changes Everything – Capitalism vs. The Climate":

"Before a flight flying from Washington DC to Charleston could depart, all the passengers were asked to leave the plain with their luggage. When they arrived at the warm dark pavement they saw that the wheels on the US Airways flight were sunken into the dark pavement, as it was soft as butter. Actually the wheels were sunken so deep that the car that came to pull the flight couldn't make it. An even bigger car was needed and the pavement for takeoff was cooled by water before the flight was ready to depart. People were upset about their 3 hours delay and a representative from the US Airways apologized the delay by explained about unusual high temperatures." He was right; the temperatures were extremely high and set new warm records (as every single year in that period of time). No one thought about the fact that the pollution from the airplane contributed to the global warming and was a central part of the climatic problem and therefor the delay of the flight.

As a retired climate engineer being a part of a generation where concerns of climate change and global warming related to user behavior have played a big role, I was irresistibly happy when I looked at the wings of the flight and saw how they were covered with photovoltaic. The fact that we can fly across the earth in flights, relying on solar energy without releasing any grams of carbon dioxide or other harmful particles, is just one of the fascinating improvement society have been through in my lifetime. It is fascinating how technology over the last decades has evolved and caused radical changes in our daily life and way of living.

It was my first trip to Sydney since I was studying there back in 2013. More than 50 years of changes and development have passed since that time, and I was really looking forward to see how Sydney was in the year of 2065. Especially because Sydney is well known as one of the front---runners in integrating sustainable urban planning strategies. That was also the reason why Robert, my grandchild, moved to Sydney for setting up a local office for Gehl Architects, where he just became an associated partner. Being a partner in a worldwide well---known company in the age of 27 was unrealistic just a few years ago. But due to the increase of available knowledge and information, young partners are getting more common. ---Simple because they are educated in fields, which did not exist just a couple of years ago. Their skills are very attractive, especially if they are good at implementing and communicating their field of knowledge in an intelligent and useful way, which indeed is the case for Robert.

The sky was clear on the way down. I noticed the developed Barangaroo and at the same time I could see how the urbanization had led to an extensive densification of the urban landscape west from the city center.

The first step out of the airplane was (as always) terrific when arriving to another climate zone. Traveling from the cold rainy weather conditions that dominate the November of Denmark and now 6 hours later feel the solar radiation in Sydney's temperate climate on a late spring Sunday afternoon was an overwhelming feeling.

Robert picked me up in the airport. When we got closer to the city center, the soundless electrical car shifted to self---control and Robert turned his seat 90 degrees, placed his hand on my shoulder, looked me in the eyes and said: "It is so good to see you. Maria and I are so glad that you would come to Sydney and stay with us for a week." I took his hand and told how much I had looked forward to see and spend time together with him and his family. Robert smiled and continued: "I actually have a meeting with the Danish engineering consultant firm 'Steensen Warming'. We plan to collaborate in future projects. They should be excellent in climatic analysis. Since this is your field, I wonder if you would join the meeting on Tuesday." I accepted the invitation. Thus it is two years ago since I retired, I am still following the research in urban climatology. I know the company is in a front position of the field. And at the same time I was honored that Robert invited his old grandfather to join him for business meetings. The DriveNow car automatically parked on the white pavement between two green trees. Just after we passed the wide bicycle lane we entered the partly grass---covered sidewalk, and Robert's neighbor came out with a friendly smile and said hallo, while he entered the car we just parked. Robert, Maria and their two years old daughter Lily lived in a small tree story row house on Crown Street in Surry Hills. I remembered the neighborhood as a vibrant livable area, which my first impression confirmed; the area still seemed to be rich on local restaurants, wine bars, arts and culture. On the other hand everything seemed to be transformed into a much more green expression. The Crown Street I remembered consisted of 2---4 story buildings dominated by dark colored materials. Now the nature was playing a much larger role of the urban expression. Different plants and types of vegetation were implemented in both the street design and in the architecture that appeared in much lighter colors. I was tied after the flight trip, so after the dinner I went to bed.

Next morning I went to the backyard with Lily and picked up four fresh eggs from the shared chicken run. In the meantime Maria made coffee and collected chives and tomatoes from the balcony. We sat down on the northern-

--faced balcony. Showered in the morning sun we enjoyed the breakfast. I told Lily how people in the past used to take vitamins along with their breakfast to get the sufficient amount of D---vitamin. Of course the two---year---old girl did not have any clue of what I was talking about. “I seems strange that people in the past took pills for something they just could receive by going outside” Maria commented.

I used the day in Sydney on my own. On the Mobility app, which combines WalkScore, BikeScore and TransitScore to give the user the possibility to take a shared car or bike, I found a route that matched my mood for the trip. First I walked through Moore Park. Besides the named it could not recognize anything. The trimmed and very well controlled lawn I expected to see was now wild nature. Just as no gardener had entered the park since I left. High and different types of wild vegetation formed the curved pathways where I briefly saw a sign in the park with words such as “increased biodiversity”, “reducing urban heat island effect”, “improving environmental acoustics”, “cleaning the air”, “positive psychological effects”. Besides the changed nature, it was clear that much more people compared to the past used the park.

The first destination for the trip was University of New South Wales, the university where I was a student many years ago. One of the things I clearly remember was that the university had plugins for electricity outside in relation to outside furniture, so the students could sit outside and work. I never saw anyone using it, but I liked the idea. Walking around on campus, I asked a student sitting with his laptop connected to a plugin outside in a shaded corner how often he worked outside. “Since the outdoor facilities were reorganized so every function fits to the local climate conditions, we always sit outside a couple of hours every day. Before no one worked outside. But after the campus was mapped by wind and solar studies, the outdoor areas are much more livable and usable. Outdoor work stations are now protected from glare, and facilities for long term stays such as outdoor canteen areas are now placed in areas where the user can choose between sitting in a shaded, sunny or filtered daylight zone depending on the mood.”

On my way out of campus I saw a group of boys playing football. As I entered the open field where they played, I could feel the light wind comfortably cooling down my skin. I was wondering if the football field was placed in a way so the wind conditions supported the player’s increased heat stress. If that was the case, it was really smart!

From the university I took the underground subway to the Botanic Garden near downtown. Like Moore Park, the Botanic Garden was changed to more wild nature and the livability of both people and natural elements had definitely increased. In a part of the garden a group of people was weeding the plants and vegetables. I read the sign “Research shows that a view to green vegetation makes sick people recover faster. People working in green office areas have less sick days and fewer headaches. A special soil bacteria releases endorphins if people inhale it. Are you stressed or burned out? You are more than welcome to take a tour through the garden and try the garden therapy yourself." For me most of the information was well known, but by writing it in the public every people got exposed to it. In the past, it was only researchers reading journals that knew that kind of stuff. I liked the fact that the distance between newly established research and ordinary people were minimized. This must be good both for the research and society.

Tuesday was meeting day and Robert and I started out by taking two city bikes. Robert organized Lily and her backpack in front of the family bike, while I entered my physical conditions on the screen placed on the rear of the bike. After dropping Lily off at the kindergarten, Robert shifted to a regular city bike. As we entered a small hill I could feel how the electrical engine supported my movements. “After the implementation of the electrical shared city bike, bicycling is now the most used common transport in Sydney,” Robert explained. “Wow! Last time I was in Sydney I only saw few people on bikes. People in sports clothes were driving in between the cars and exercised to get over the hills,” I answered. “Back in 2012 Copenhagen was already well---known for its bike ability, but for me

it was clear that people did not bike in Sydney because of the heat and the many steep hills. At that time I couldn't imagine how the technology could develop bicycles taking the users psychical conditions, heat stress and clothing into consideration, so we now can bike without getting sweaty and at the same time get exercise." Robert laughed and said: "Yes, you are lucky, old man. Otherwise you couldn't follow my pace".

We parked the city bikes in front of the office. The office was located in the CBD and all the facades of the high glass skyscrapers were partly shaded by free hanging vegetation. In the light office environment Peter from Steensen Warming showed us around. Between the plants on the wall there was a quote from Simon Sinek: "Working hard for something we don't care about is called stress; working hard for something we love is called passion". After the short introduction where Christina from the governmental Urban Planning Institute of New South Wales participated, we decided to take a walk---and---talk---meeting. Before entering the two---hour walking path we picked up a coffee at the local coffee shop. I was clear that no one from the group considered buying the coffee in Starbucks next to the local coffee shop.

The agenda for the meeting was to introduce Robert and me to the planning strategies that Sydney has been through during the last decades. At the same time Robert should introduce his newly established education in the field of "Life Quality Engineering". Peter started out by explaining how Steensen Warming work with climatic parameters in urban planning and how their main focus was the relation to outdoor comfort and livability and the urban energy consumption. He started by showing us two pictures of two buildings in the same French city. First he pointed at a picture of a building built in the 19th century. It was a light brick building where the windows were closed off by lamellas. He argued that in this period people spent most of their time outside during the day, since the primary work was done in the fields of agriculture before the industrial revolution. Therefore the building was more isolated to the outdoor climate, because people had been out door most of the day. The lamellas in front of the windows ensured sufficient amount of diffuse daylight while ventilating the room. Then he pointed at a new picture on his tablet showing a fully glazed museum. "After industrial revolution people's life changed and in average people spent 95% of their time inside buildings. Due to that fact, people want to be exposed to the outdoor while the architecture language in that period always was about relating the indoor to the outdoor. This resulted in increased energy consumptions due to overheating, but also warming in the winter period depending on the climate," Peter said.

Camilla continued: "As urban planners we try to convert the citizens of city to be more outside and get more exercise, since the indoor lifestyle where people often work most of the day sitting in front of their desk results in massively lifestyle diseases including obesity. From the political point of view there was a huge potential back in the 2030'ies to promote the citizens to be more active. From an economical point of view it makes sense to invest in prevention by promoting attractive outdoor activities since it is resulting in reduced hospital bills."

"My field of work is orientated about finding the right combinations of things that are good for both improving the individual's quality of life and is an advantage for society at the same time." Robert applied. "As a well---known example is the investment of urban vegetation which solves the urban heat island effect and is an important element of handling rain water. At the same time it adds value to the citizens. We all love green trees, and the common trend of being closer related to the nature is achieved due to common investment. All in all, it is a win---win situation."

Peter nods confirming. "People getting more exposed to nature and spending more time outside just emphasize my point by showing the two pictures from the past. Our day's trend is to find the right balance and urban planning together with architecture need to support that."

“From the governments point of view we want to support the individual potential. We don’t want to enforce people. We want to set up the right boundary conditions so people are supported to do what they appreciate.” Camilla said. “Like when costumers are exposed to candy and other stuff they hardly try to avoid in the waiting line for the desk in the supermarket. Just in an opposite way; we want to inspire people to make the healthy choices.”

Until that point I didn’t say much. I was just inspired by listening to the new focus points in urban planning compared to when I worked as a young engineer. I added: “My generation of urban climatologists started implementing climatic simulations into the design process. It was amazing to be a part of this new implementation. But because it was new back in 2040, planners and decision makers were just fascinating about the way of presenting climatic data without actually understanding it or being able to valuate, if the presented data was good or bad. It was new stuff and just fascinating. At the same time we used weather files representing the last 20 years of statistics when we designed cities that would be finish 20 years later. Looking back, it doesn’t give any sense when the climate has changed so much. How do you implement climatic knowledge in urban planning today?”

“I see your point” Peter answered. “In that perspective we have been through a large game changer. In the process you refer to, we as climate consulting engineers were a part of the team in the master planning competitions. Since it was a competition the money was limited, which was the reason why the time spent on climatic research was pure. But what happened was that the decision makers as you mention were impressed by the climate data presented, so we often won the competitions simply because we were the only team implementing climatic analyses. But since the decision makers then had accepted an urban layout, it was almost impossible to change the building height, street width and orientation at that time. Even though it was first after winning the competition we actually had time to get deep into climatic analyses, and we often suggested radical changes but that was to late.”

Camilla continued: “From the governments point of view we got aware of that cash flow conflict as Peter just explained. And since the climate for a given area is the same no matter which competition team who wins, we decided to hire climate engineers before starting the competition. In that way Peter and his colleagues are paid the sufficient amount of money to investigate the local climate conditions and challenges. So nowadays when architectural companies and all the other relevant fields receive the competition program it includes a deep climatic analysis, things to be aware of, and different kind of strategies for handling the different climatic challenges in a sustainable manner. Peter or his colleagues are then represented in the jury, since they have the competences to evaluate the master plans climatic aspects.” When I heard how the procedure has changed, it really made sense for me. And it was a pleasure to listen to the rest of their meeting, where topics such as the use of GIS and big data related to user behavior, validation of real design, remote cooling using sea water and the increased power of CFD was discussed.

Robert and I decided to walk back to Surry Hills after the meeting. As we walked at the bright pavement I observed how the high albedo materials, cool roofs and the appropriate landscape were combined in a coherent and aesthetic way. Robert explained how this part of the city has been through a renovation, some buildings were demolished and some places were planned in a way, so the urban fabric blocks the warm wind from the inner land, and on the other hand promote the cooler air flow from the ocean side. ---All done to optimize the outdoor comfort and to minimize the energy use for buildings.

The rest of my stay I enjoyed spending time with my relatives in this lovely city. Now I’m sitting in the plane while I’m forced back into the seat due to the high acceleration of the solar plane. Through the curved screens I look over Sydney, convinced that this Sydney I just visited is way better, than the Sydney I lived in back in 2012. I am thankful for being a part of a generation, where it has been proven that a shift from fusil fuels to renewable energy

technologies combined with passive climate solutions, had increased the quality of life for the general citizen, for my grandson Robert and from my great---grandchild Lily.