

Author: Jacky K.C. LAI

Supervisor: Rosie van der Schans, Lex van Deudekom, Leeke Reinders

Passage of Wind

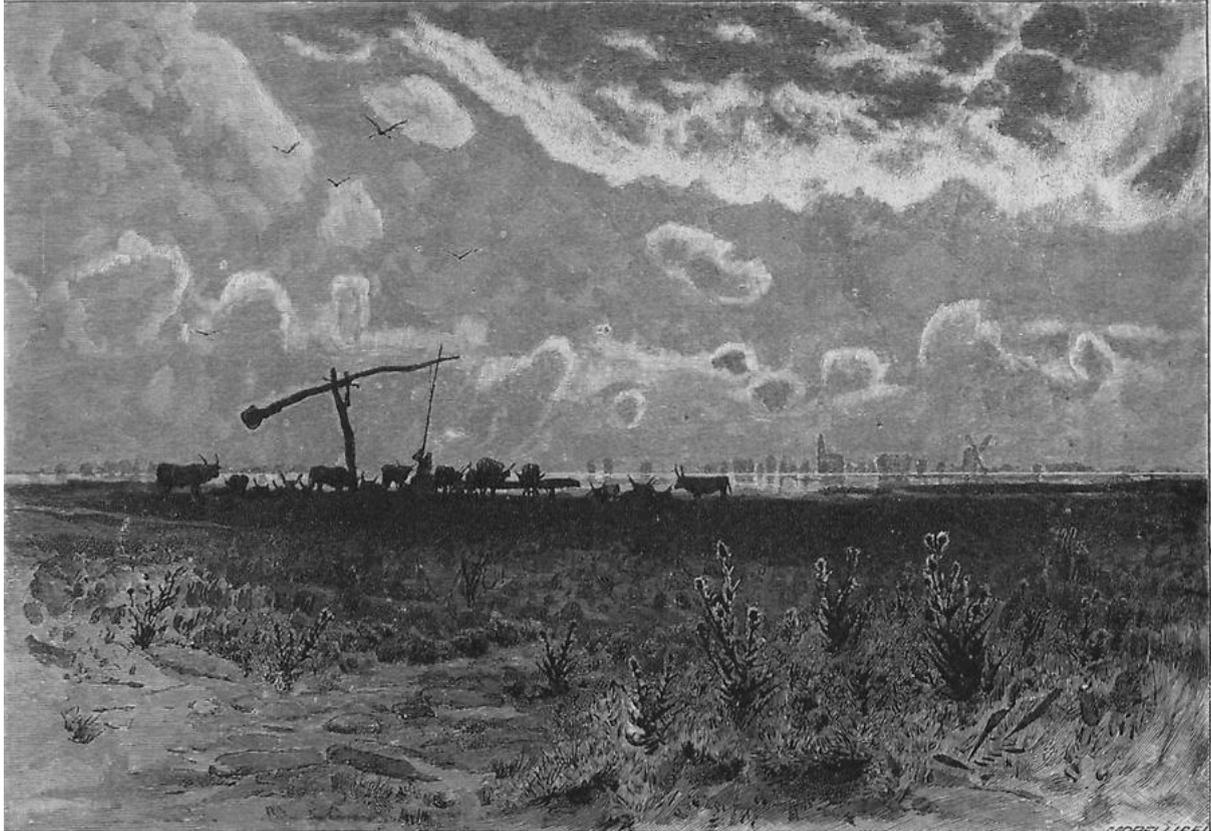


Figure 1.0 *Delibab (Fata morgana) auf dem Alföld. Paul Vago. 1891*

Initiatives

“A shimmer on the horizon, for instance, could falsely lure the observer by creating the appearance of distant hills. A meadow might appear to be a forest, a farmhouse, a castle...the hot soil heated low-lying air unevenly, causing wavelike motions that distorted distant objects.”

— from Coen, Deborah R. *Climate in Motion: Science, Empire, and the Problem of Scale*. Chicago, IL: University of Chicago Press, 2020. pp. 288

Stepping onto the pasture in the parks of Brussels, there would be a high chance that the ground below is an artificial earthworks, produced as a consequence of various urban developments. Botanists, landscape architects and urban planners in Brussels contributed their lifetimes to create parks representing the ideals of their respective generations, such as axiality, hierarchy and symbiotic ecology. In contrast, there are some green pastures in the city which did not result from the design planning, but rather as the by-products of infrastructure. They might follow the railway

tracks to form a green belt, conquer a ruined factory to form small urban woods or spread over a vast abandoned train yard to form a frische. Due to the scale of urban infrastructure, these fringe and frische are also enormous in terms of width or length, creating a very spectacular landscape and horizon in the context of a crowded capital city.

To narrow down my obscure interest in the research direction for the frische, I tried to pull myself off from the bipolar discussion of development and anti-development and ask myself how I appreciate the existing beauty of the site and its dialogues with the urban fabric. In such a way, there could be an alternative interpretation of the character and lifetime of the abandoned land, visualizing a scenario out of some invisible correlations. Therefore, I stood again on the frische. Realising my body was no longer under the protection of buildings and trees, I looked far away and high up to the sky, rediscovering the horizon of the land and the swirling dome above it. The clouds were moving fast, on the lower level of the atmosphere, while they turned into a group of scattered cotton candy at the higher altitudes. The scale of the site offers or restores the sky before urbanization, it is no longer trimmed away by the roofs nor completely insulated from the glasshouse, but allows citizens to interact again with the landscape of air: the contours of wind, the streams of temperature and the forest of raindrops, which are approximately 4.8×10^{10} raindrops in the 24-hectare frische.



Figure 1.1 A cutscene from *Weathering with You*. Directed by Shinkai Makoto. 2019.

The Old and New Climate Culture

“One of the greatest challenges scientists face today is to model the very small-scale process by which water condenses around an atmospheric particle and begins to form cloud, in relation to the very large-scale effects that clouds have on the global radiative energy balance...the history of dynamic climatology is the story of this multiscale, multicausal way of engaging with the world.”

— from Coen, Deborah R. *Climate in Motion: Science, Empire, and the Problem of Scale*. Chicago, IL: University of Chicago Press, 2020. pp. 3

The climatic aspect of a site in today’s practice is often used to simulate the impact of construction in terms of wind, temperature and gas emission, under the global discussion of climate change or even catastrophe of civilization. Nonetheless, the origin of climatic science before the invention of computers was closely tied to geography, botany and agriculture. The scientists who drafted the scope of climatic science in the 19th century relied on their observations and analysis of soil hydrology, colonies of plant species, and verbal legacy among the farmers to figure out the relationship between local weather and regional climatic sequences. The founder and director of the Brussels Observatory, Adolphe Quetelet also kept his eyes on the periodic phenomena performed by the plants and animals in Brussels apart from the standard scientific measurement of the climate of Brussels. Thus, our understanding of the phenomena in the atmosphere was built on the basis of the ground and the capability of working across different scales.

In contrast, the concept of climate has long been isolated from our touch under the influence of modernism and globalization: it was engineered to distinguish indoor and outdoor; it represented a monster which drove the citizens to build stronger defensive infrastructure; and it extended into a global issue waiting to be solved by the international leaders.

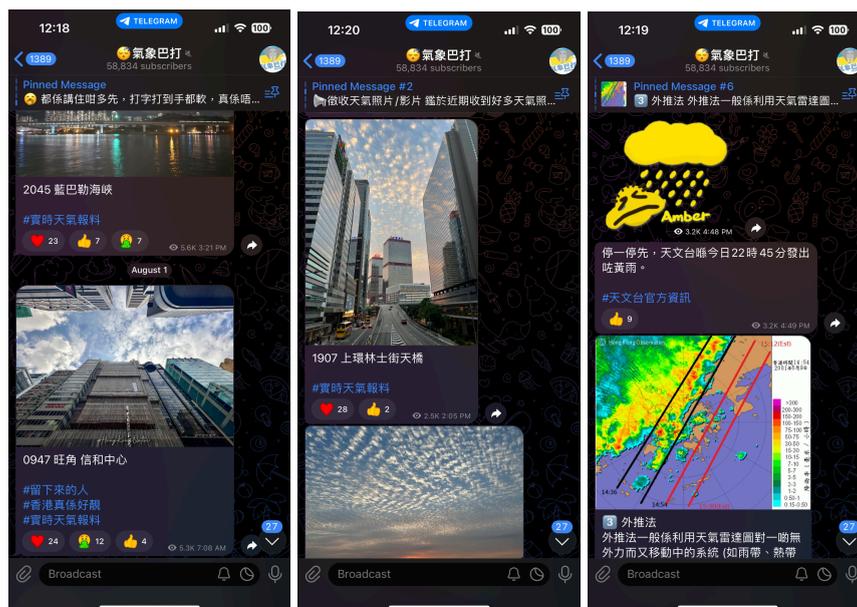


Figure 1.2 Screenshots from the Telegram channel WeatherJJ. Author. Telegram. 2023.

In the eyes of a citizen, the weather is more or less an indicator of their working conditions: whether it is dangerous to work outdoors or comfortable to wear a jean jacket. Nonetheless, some people have the enthusiasm to promote weather and climate as something more than predictions, perhaps a culture. In my hometown Hong Kong, there is a group of volunteers who are operating an online platform where subscribers can share their photographs of the sky with others. The digital interactions between the users and the administrators become a public service which does not only provide forecasting but also the appreciation and observation of the urban air. This lens became crucial to understanding the phenomena of micro-climate in the city, which many present urban planners, architects, civil engineers and landscape architects are trying to visualise and problematise. The phenomena usually include the urban heat island effect, partial torrential rainfall and the skyscraper wind effect. However, the air around our living space or bodies has often been seen as negligible to the design decision on a bigger scale.

Besides being the frontier of combating global warming and climate change, can architects emphasize the beauty of flux across different scales so that insulation is no longer the only way of communication between the citizens and the atmosphere? A Swiss architect Philippe Rahm has carried out a series of research focusing on the contemporary relationship between architecture and thermal climate. He redefined architecture as a thermal condition for hosting different functions and visualised the flux of air between the urban landscape and the buildings. Furthermore, research on meteorological urbanism was conducted before his studio proposed the new architecture for the Central Park of Taichung in Taiwan. Anchors of micro-climate were mapped out while the heat, humidity and pollution of air were also visualized in sections. The tools used in the research were applied again in the designs of a few service buildings inside the park, including a Climatorium, The Attenuated Exterior and a Meteorological Garden. Thus, these built projects all show a variety of climatic conditions and the designs of functioning different programmes in such conditions.

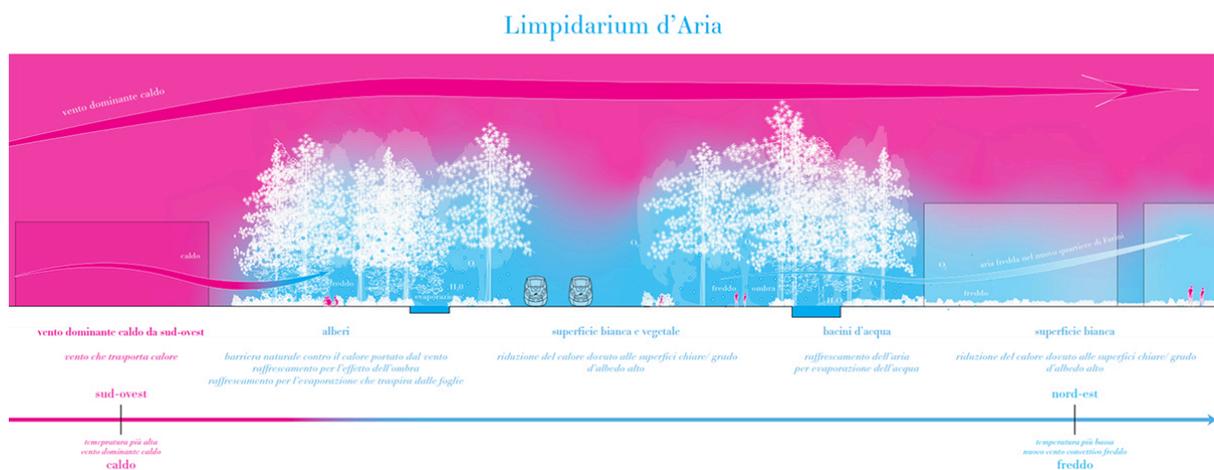


Figure 1.3 *Limpidarium, Scalo Farini Masterplan, Milan. Image © Philippe Rahm with OMA and Laboratorio Permanente, 2022*

“Architecture should no longer build spaces, but rather create temperatures and atmospheres...to give rise to architecture as a convective movement of air, creating a place like geography, designing space like climate, atmosphere and gastronomy.”

— from Rahm, Philippe. *Climatic Architecture*. Actar Publishers, 2023. pp. 296-298

Climatic Biography

One of the aims of this research is to determine the scale and interference of the possible architectural design at Josephat Frische, while providing an alternative perspective to save designers from the polarized discussion between greenery preservation and housing development of the site. Although being locked up, the air and aerosols of the frische should still be able to pose an impact on the micro-climate conditions of the Schaerbeek neighbourhoods. Therefore, the climatic quality of the site can be a subject to investigate in order to reveal the hidden order and territories apart from the biosphere, enriching the complexity of the wasteland and its existing significance to the urban environment of Brussels.



Figure 1.4 *Untitled. Brussels Fire Brigade. Brussels: Heavy rain closes tunnels and public transport. The Brussels Times. 2023*

In order to visualize the hypothesis, the methodology of this thesis research can take reference from the classical and contemporary meteorological measurement methods for different scales: climate writing on the physiological scale, botanical studies on the biospheric scale, in-situ meteorological data collection on the neighbourhood scale, and computer simulation on the urban scale. Rather than the conventional scientific explanations and predictions, this combination of different measures will allow the data and information to build a more anthropological bond with the citizens, telling an urban life dancing with the dynamics of weather. This interpretation of local climate can be further strengthened by looking into the historical context of local meteorology in Brussels, giving more insights into how the people of Brussels read the climate and the scientific observations presented by the meteorologists. Meanwhile, the

graphical representation of the climate in such many scales will be also challenged and even innovated in a way that can be more communicative. The books *Meteorographica, Or, Methods of Mapping the Weather* by Francis Galton, *Climate Architecture* by Philippe Rahm and *Drawing Climate: Visualising Invisible Elements of Architecture* by Ryan Daniel J, Jennifer Ferng, and Erik G L'Heureux, all demonstrated a deep and thorough experiments of representing air flow, thermal gradation, precipitation density, etc.

At the final stage of the research, the content will be compiled into a climatic biography of the site, and even the edge of the Schaerbeek neighbourhood. This biography will act as a guidebook for the designers who insist in respecting the frische as a landscape more than an empty land waiting for development. Nonetheless, the programme of the proposed design should be beneficial to the Schaerbeek community, not standing as an intangible manifesto in the scope of urban design. The comparison and conjecture of the possible climatic transitions should lead to the issue and potential of design, before taking a stance of building or not building on the last green in the town.

Bibliography

Brussels: Heavy rain closes tunnels and public transport. The Brussels Times, 8 November 2023.

Coen, Deborah R. *Climate in Motion: Science, Empire, and the Problem of Scale.* Chicago, IL: University of Chicago Press, 2020.

- A book which talks about the origin of climatology and the challenges of scale in both pre-modern and contemporary times.

Claire Billen, Michel De Beule, Marie-Françoise Degembe, Denis DiagreVanderpelen, Catherine Franceschi-Zaharia, Eric Hennaut, Michael Jakob, Thierry Kandjee, Serge Kempeneers, Luisa Limido, Chiara Santini, Sylvie Van Damme, Ursula Wieser Benedetti. *Brussels. Two and a Half Centuries of Public Parks and Gardens. 1775-2020.* Text. C.I.II.III.IV.A, 5 November 2019.

- A book which talks about the history of urban landscape design in Brussels, in relation to the respective social ideals in different periods

Dufour, L. *Esquisse d'une histoire de la météorologie en Belgique.* Ciel et Terre, Vol. 61, p. 1. 1945.

Galton, Francis. *Meteorographica, Or, Methods of Mapping the Weather: Illustrated by Upwards of 600 Printed and Lithographed Diagrams Referring to the Weather of a Large Part of Europe, During the Month of December 1861.* Macmillan. 1863.

Makoto, Shinkai, director. *Weathering with you.* Japan. Toho Company, Ltd., 2019.

- A movie which portrays many urban scenes in relation to micro-climates and anthropological interpretations of weather in the Japanese culture

MET WARN 天氣預警. 解構氣象點線面 . Humming Publishing. Hong Kong. 2023.

- A book which shares a bottom-up approach to meteorological analysis in Hong Kong and criticises the insufficiency of the current forecasting procedures carried out by the government.

Rahm, Philippe. *Climatic Architecture*. New York, Barcelona. Actar Publishers. 2023.

- A book which talks about the new interpretation of architecture in the context of climate, especially in thermal dynamics.

R. Hamdi, F. Duchêne, J. Berckmans, A. Delcloo, C. Vanpoucke, P. Termonia,
Evolution of urban heat wave intensity for the Brussels Capital Region in the ARPEGE-Climat A1B scenario,
Urban Climate, Volume 17, 2016, Pages 176-195.

Ryan, Daniel J, Jennifer Ferng, and Erik G L'Heureux, eds. *Drawing Climate: Visualising Invisible Elements of Architecture*. Basel: Birkhäuser, 2022.

- A book which criticises the graphic representation of climate in architectural drawings

Next steps for Brussels 'ambitious' flood and drought plan. The Brussels Times, 23 June 2023.