ILA
Institute of Landscape Architecture
Professor Christophe Girot
theory lab

Climate and Vegetation FS 2017 V06

Vegetation and climate are probably the most manifest elements that distinguish architecture from landscape architecture. Since its early appearance as algae, ferns and bryophytes, vegetation has evolved through the effects of climate and atmospheric change into more complex life forms. Aside from Bryophytes, Basidiomycetes and Ascomycetes, Gymnosperms and Angiosperms are the two orders that define most terrestrial vegetation today. They span an extraordinary range of climates from the extremely wet and cold to the very hot and dry in a vast variety of vegetative forms, textures and substances. Unlike buildings, plant growth expresses a living process that is in direct contact with ambient conditions such as soil, wind, water and exposure, which determine its form. This can be seen today within established plant communities, which have been severely disrupted by the effects of accelerated climate change. One of the most exemplary cases is that of the Chinese windmill palm (*Trachycarpus fortunei*), which has now sprung out of the exotic 19th century lakeshore gardens of the Lac Léman and the Lago Maggiore to spread spontaneously from there into the alpine foothills. The phenomenon is linked to milder weather conditions in the winter that have enabled the plant not only to survive, but also to flourish exponentially in the underbrush. Because of climate change, there will soon be some palm forests covering parts of Ticino and the Lemanic coast.

Windmill palm in Ticino.

Vegetation is the living and seasonal reference for any given climate. Although it is often interpreted as a permanent and traditional feature of a landscape, it can actually be prone to sudden change. A plant is only a temporal reference in that it either stands or passes on following the course of evolution. Agriculture and other landscapes practices therefore tend to develop at a precise span of time, at a given moment in climate history, and demand a relatively strong adaptability with reference to cultural practices in order to survive. Who would have guessed, thirty years ago, that England would be able to establish its own vineyards in the Southern Downs of Sussex and Hampshire and thus make a sparkling wine good enough to rival Champagne? From undrinkable dandelion wine to a good bubbly in the space of three decades is quite an achievement, due mostly to very large investments and climate change. The selection and handling of plant material in a landscape remains highly symbolic and ideological. And throughout history, these have changed drastically along with ambient conditions. The two examples mentioned above are only indicators of much greater transformations, in which a further shift towards warmer temperatures is expected in successive generations. Every epoch makes its choice of desirable and undesirable plants, but this time it is climate that is going to affect this selection. With their specific roles and forms, these plants become the expression of our circumstantial preconceptions about nature. Vegetation is therefore the necessary expression of an idea of nature, which is today rapidly changing. As such, it is the most visible part of a much larger construct wherein the choice, the order and the spatial arrangement of plants play a primordial role in expressing a balanced or imbalanced relationship to earth.

Windmill palm in Ticino.

www.girot.arch.ethz.ch
www.facebook.com/LandscapeArchitectureETHZurich

On another register, our scientific age would prefer that vegetation remain just the expression of a natural and quantifiable phenomenon called biomass. Vegetation is indeed the only living material capable of efficiently transforming solar energy into both food and fuel. In the end, petroleum is just a fossilized form of concentrated biomass. Vegetation is capable of fixing vast quantities of carbon from the atmosphere as well as from a broad variety of noxious chemical elements, locked in the water and ground, through a root system. “Phytoremediation,” as it is commonly called, is only beginning to play a significant role in the treatment of contaminated soils and waters. It will play a growing role in the transformation of industrial and urban landscapes in the future. In the Anthropocene age, vegetation will become highly competitive in the treatment of contaminants, and in food and energy production. This, in turn, will affect the entire landscape aesthetics of a region.

Vegetation, together with climate, will evolve rapidly into new forms of bioclimatic expressions. Plants will be used to cool buildings, retain moisture and help treat heat sink problems. At a larger scale, desiduous trees planted in temperate cities will significantly improve microclimatic conditions by generating shade in the summer and allowing sunshine to come through in the winter. Hedgerows will be used to reduce the impact of wind and dust on the environment, thus reducing the effects of dessication and drought. Clusters of trees may also be used to help to gradually reestablish a balance in the water tables. We have entered an age in which vegetation practices, due to climate change, are breaching tradition and need to be entirely rethought and reorganized at the territorial scale. This is not just a matter of providing added raw materials and pleasure grounds for humankind, it is about fostering ecological balance and diversity in a rapidly changing world through the rethinking of a continual biological network of vegetation. Undeniably, we have reached a paradigmatic moment in the way we understand and think about nature. We may draw some lessons from past periods of history when massive structural plantings occurred, but with the massive environmental and climatic changes that loom ahead, it seems pointless to argue about the greater naturalness in the art of landscaping. The question at stake now is simply, how do we think and reinvent nature, and how do we accept a more sustainable aesthetic relationship towards it?

Upperton Vineyards in Sussex, England.

Literature:

Ellenberg, Heinz: Vegetation Mitteleuropas mit den Alpen in ökologischer, dynamischer und historischer Sicht. Stuttgart 2010.

Florineth, Florin: Pflanzen statt Beton. Handbuch für Ingenieurbiologie und Vegetationstechnik. Berlin 2004.

Hansen, Richard; Stahl, Friedrich: Die Stauden und ihre Lebensbereiche in Gärten und Grünanlagen. Stuttgart 1997.

Krupka, Bernd: Dachbegrünung. Pflanzen- und Vegetationsanwendung an Bauwerken. Stuttgart 1992.

Mader, Günther: Bäume - Gestaltungsmittel in Garten, Landschaft und Städtebau. Köln 2004.

Meyer, Franz H.: Bäume in der Stadt. Stuttgart 1982.

Warda, Hans-Dieter: Das grosse Buch der Garten- und Landschaftsgehölze. Bad Zwischenahn 2001.