EPFL

AR-437   **A history of abstraction in architecture**
                Aureli Pier Vittorio

Cursus		Sem.	Type
Architecture		MA1, MA3	Opt.

Language of teaching	English
Credits	3
Session	Winter
Semester	Fall
Exam	Oral
Workload	90h
Weeks	12
Hours	**2 weekly**
Courses	2 weekly
Number of positions	

Summary

A history of abstraction from the birth of geometry to algorithmic governance.

Content

Abstraction passes for 'absence' – as distinct from the concrete 'presence' of objects, of things. Nothing could be more false. For Abstraction's modus operandi is devastation, destruction (even if such destruction may sometimes herald creation). Signs have something lethal about them – not by virtue of 'latent' or so-called unconscious forces, but on the contrary, by virtue of the forced introduction of abstraction into nature.
Henri Lefebvre, *The Production of Space*, 1974

In his essay "Abstraction and Culture" the American painter Peter Halley lamented the persistent belief that abstraction is a stylistic device or invention, born out of the artist's formal concerns. For Halley, abstraction unfortunately continues to be seen as a free play of form that is completely self-referential vis-à-vis social and political issues. "In thinking about this most rarefied of visual languages," Halley writes, "it seems we intellectually retreat into the cloister of high culture; we deny that abstraction is a reflection of larger historical and cultural forces. We deny that the phenomenon of abstraction only gains meaning to the extent to which it does reflect larger forces and is embedded with their history". This understanding of abstraction as a retreat from the world is dominant within the discipline of architecture, where it is associated with modernist formal simplicity and the reduction of architecture to platonic object. The term "abstraction" evokes an aesthetic of formal restraint, reduction to essentials. The course aims to overcome the stylistic interpretation of abstraction and introduce students to a more complex and nuanced reading of this fundamental condition in the history of human civilization.
"To abstract" comes from the Latin verb *trahere*, which means to pull something essential out from the totality of which it is a part. Abstraction is a process through which man seeks to reach generic frameworks rather than specific solutions. With the rise of early states and complex societies, abstraction became the condition sine qua non of government. Large quantities of people, goods, and agricultural produce could effectively be governed only by reducing them to abstract signs to be computed. Yet this process of abstracting reality into signs impacted reality itself, as physical space itself was ordered and formalized according to the abstractions of calculus and economic rationality. An important example of how abstraction became concrete within urban form is the rise of geometry as a method to measure the land. Herodotus narrates the origin of geometry in ancient Egypt, with the professional practice of the "stretcher of the rope." This practice, in which rope was used to make the measurements necessary for building temples and granaries, found a significant application in parceling out the soil when it reemerged after the yearly Nile floods. It is within this context that the fundamental problems of geometry were defined, such as the tripartition of angles and the magnification and diminution of volumes, including the doubling of cubes. The use of meticulous calendars or even astronomy are stripped of their religious aura when we understand how they were instrumental in empowering the measuring prerogatives of the ruling class, made of state functionaries and priests. With the rise of private property and the possibility of exchanging products for money, the abstractness of geometry and mathematics became a ubiquitous social force. However, while in antiquity this social force was limited to the exchange of commodities as objects, with the rise of modernity the abstraction of exchange and the equivalence of value begin to include human labor, since the latter is no longer slave labor devoid of wage, but becomes sold and purchased as a commodity among "free" citizens. Here, labor is no longer based on direct material interchange; it depends on capital. It is at this point that labor becomes what Marx defined as *abstract labor*. It is precisely the rise of abstract labor as a fundamental datum of modern political economy that gave rise of the abstract space of the factory as a generic built framework and the industrialization of building techniques that

proliferated into any aspect of the built environment, from housing to infrastructure, to landscape design. Within an urban space increasingly governed by financial capital and its algorithms, abstraction is everywhere materialized into the material and immaterial spaces of our daily existence. Piet Mondrian's utopian vision of a world ruled by the aesthetics of abstraction is now finally realized. The course will trace the history of abstraction in architecture from the advent of sedentary societies to today by focusing on pivotal moments: the rise of calculus, geometry and architectural drawing, the building of large-scale structures such as Egyptian Pyramids and European Cathedrals, the planning of monasteries and the engineering of infrastructure, the building of houses, glasshouses, factories and data centers.

Course Sessions
1st Session, 19.09.2019
- *From 'Points' to 'Surfaces':* Domestication and Abstraction
- *Calculating, Measuring, Governing space:* Early States in the Near East and the Rise of Mathematics and Geometry

2nd Session, 03.10.2019
- *The Pyramid and the Temple:* Geometry, Design and Labor Organization in Ancient Building Sites
- *Patriarchy and Abstraction:* Geometry, Survey and Land Property in Ancient Rome

3rd Session, 17.10.2019
- *Abstraction and Sameness in Medieval Times*
- *Abstraction and Disegno:* From the Architecture of the Orders to Descriptive Geometry

4th Session, 31.10.2019
- *Architecture Without Quality:* From Sebastiano Serlio's Temperate Classicism to the English Terraced House
- *'Free' Plan:* Commodity Exchange, Abstract Labor and the Rise of Industrial Architecture

5th Session, 14.11.2019
- *Territory and Abstraction:* Tracing the Urban Grid from Colonialism to Urbanization
- *Architectural form and Economy:* The legacy of Jean-Louis-Nicolas Durand's *Precis*

6th Session, 28.11.2019
- *Metropolis and Abstraction:* From Ludwig Hilberseimer's *Metropolis Architecture* to Archizoom's *No Stop City*, to Rem Koolhaas's *Generic City*
- *The Return of the Factory:* From Cedric Price to Data Centers

General Readings
- Henry Lefebvre, "From Absolute Space to Abstract Space". In *The Production of Space*, translated by Donald-Nicholson Smith, 229-291. London: Blackwell, 1991.
- Alfred Sohn-Rethel, "Social Synthesis and Production". In *Intellectual and Manual Labour*, 83-135. London: Macmillan Press, 1978.
- Meyer Schapiro, "The Nature of Abstract Art". In *Modern Art 19th and 20th Century*: *Selected Papers*, 185-211. New York: George Braziller, 1978.

Learning Outcomes

By the end of the course, the student must be able to:
- Interpret in a critical manner the concepts developed during the course
- Argue the relations between socio-political issues, urban form and architecture
- Develop a reflection on the relationship between historical conditions and architecture
- Close reading of projects in the context of their historical period

Expected student activities

Personal work during the semester, reading of texts, personal study of a theme.

Resources

Bibliography

- Peter J. Wilson, *The Domestication of the Human Species.* New Haven and London: Yale University Press, 1988.
- James C. Scott, *Against the Grain: A Deep History of the Earliest States.* New Haven: Yale University Press, 2017.
- Mario Liverani, *Uruk, The First City.* Sheffield: Equinox Publishing, 2006.
- Tim Ingold, *The Appropriation of Nature: Essays on Human Ecology and Social Relations.* Iowa City: University of Iowa Press, 1987.
- Morris Kline, *Mathematical Thought from Ancient to Modern Times*, volume 1. New York: Oxford University Press, 1990.
- Lewis Mumford, *Technics and Human Development: The Myth of the Machine*, volume 1. New York: Mariner Books, 1971.
- Barry J. Kemp, *Ancient Egypt: Anatomy of a Civilization.* London: Routledge, 2005.
- Zahi Hawass, *The Pyramids of Ancient Egypt.* Pittsburgh: Carnegie Museum of Natural Art, 1990.
- Craig B. Smith, *How the Great Pyramid was Built.* Washington: Smithsonian Institution Press, 2004.
- J. J. Coulton, *Ancient Greek Architects at Work: Problems of Structure and Design.* Ithaca: Cornell University Press, 1982.
- Richard Seaford, *Money and the Early Greek Mind: Homer, Philosophy, Tragedy.* Cambridge: Cambridge University Press, 2004.
- *Geometria e Architettura,* edited by Riccardo Magliari. Rome: Gangemi Editore, 2010.
- O. W. A. Dilke, *The Roman Land Surveyor: An Introduction to the Agrimensores.* New York: Barnes and Nobles, 1971.
- Various Authors, *Misurare la Terra: Centuriazione e Coloni nel Mondo Romano.* Modena: Franco Cosimo Panini, 1985.
- David Gilman Romano, "The Orientation of Towns and Centuriation". In *A Companion to the Archeology of the Roman Republic*, ed. Jane DeRose Evans, 251-267. Hoboken, NJ: Wiley-Blackwell, 2013.
- Yan Thomas, "La valeur des choses: Le droit romain hors la religion". In *Annales: Histoire, Sciences Sociales* 57, no. 6 (December 2002): 1431–1462.
- Emanuele Lugli, *The Making of Measure and the Promise of Sameness.* Chicago: University of Chicago Press, 2019.
- David Friedman, *Florentine New Towns: Urban Design in the Late Middle Ages.* Cambridge: MIT Press, 1989.
- Walter Horn, Ernest Born, *Plan of St. Gall: Study of the Architecture and Economy of, and Life in, a Paradigmatic Carolingian Monastery.* Los Angeles: University of California Press, 1980.
- Wolfgang Braunfels, *Monasteries of Western Europe. The Architecture of the Orders*, 67-110. London: Thames and Hudson, 1972.
- Jean Gimpel, *The Cathedrals Builders*, translated by Teresa Waugh. London: Pimlico, 1983.
- Robert A. Scott, *The Gothic Enterprise: A Guide to Understand the Gothic Cathedral.* Los Angeles: University of California Press, 2011.
- Michael Baxandall, *Painting and Experience in Fifteenth Century*. Oxford: Oxford University Press, 1988.
- Pier Vittorio Aureli, "Do You Remember Counterrevolution. The Politics of Filippo Brunelleschi's Syntactic Architecture". In *AA Files* n. 71 (2015): 147-165.
- Amir Djalali, "Prehistories of Common Spaces: Conflict and Abstraction in Renaissance Architecture". In *The City as a Project*, edited by Pier Vittorio Aureli, 102-135. Berlin: Ruby Press, 2014.
- Marvin Trachtenberg, *Building in Time: From Giotto to Alberti and Modern Oblivion.* New Haven, London: Yale University Press, 2010.
- Mario Carpo, *The Alphabet and the Algorithm.* Cambridge, MA: The MIT Press, 2011.
- Mario Carpo, "The Architectural Principles of Temperate Classicism: Merchant Dwellings in Sebastiano Serlio's Sixth Book". In *RES: Anthropology and Aesthetics* 22 (Autumn 1992), 135-151.
- Manfredo Tafuri, "Venetian Epilogue. Jacopo Sansovino from *inventio* to Consuetudo". In *Interpreting the Renaissance*, 219-258. New Haven, London: Yale University Press, 2006.
- Maria Shéhérazade Giudici, "Government and the Emergence of *Architecture d'accompagnement*, 1584-1765". In *The City as a Project*, edited by Pier Vittorio Aureli, 140-169. Berlin: Ruby Press, 2014.
- Stefan Muthesius, *The English Terraced House.* New Haven, London: Yale University Press, 1982.
- Karl Marx, "Introduction". In *Grundrisse: Foundations of the Critique of Political Economy*, 81-114. London: Penguin, 1973.
- Betsy Hunter Bradley, *The Works: The Industrial Architecture of the United States.* Oxford: Oxford University Press, 1988.
- David F. Noble, *America by Design. Science, Technology, and the Rise of Corporate Capitalism*. New York: Alfred A. Knopf, 1977.
- Thorsten Bürklin, Jürgen Reichardt, *Albert Kahn's Industrial Architecture. Form Follows Performance.*

Basel: Birkhauser, 2019.
- Francesco Marullo, "Architecture and Revolution. The Typical Plan as Index of the Generic". In *The City as a Project*, edited by Pier Vittorio Aureli. Berlin: Ruby Press, 2014.
- Pier Vittorio Aureli, "Appropriation, Subdivision, Abstraction: A Political History of the Urban Grid". In *Log* 44 (Fall 2018): 139-167.
- Adrian Randolph, "The Bastides of Southwest France". In *The Art Bulletin* 77, no. 2 (June 1995): 290--307.
- Nicholas Blomley, "Law, Property, and the Geography of Violence: The Frontier, the Survey, and the Grid". In *Annals of the Association of American Geographers* 93, no. 1 (March 2003): 121.
- John W. Reps, *Town Planning in Frontier America.* Princeton: Princeton University Press, 1969.
- Ross Exo Adams, *Circulation and Urbanization*. Los Angeles, London: Sage, 2019.
- Antoine Picon, *French Architects and Engineers in the Age of Enlightenment*. Cambridge: Cambridge University Press, 2010.
- Jean-Nicolas-Louis Durand, *Précis of the Lectures on Architecture: With Graphic Portion of the Lectures on Architecture*. Los Angeles: Getty Research Institute, 2000.
- Werner Szambien, *Jean-Nicolas-Louis Durand, 1760-1834: De l'imitation à la norme*. Paris: Picard, 1984.
- Georg Simmel, "The Metropolis and Mental Life". In *The Sociology of Georg Simmel.* New York: Free Press, 1974.
- Ludwig Hilberseimer, *Metropolisarchitecture.* New York: Columbia Books on Architecture and the City, 2014.
- Pier Vittorio Aureli, "Architecture For Barbarians. Ludwig Hilberseimer and the Rise of the Generic City". In *AA Files* 63 (2011): 3-18.
- Mario Tronti, "Society and the Factory". In *Workers and Capital*. London: Verso, 2019.
- Roberto Gargiani, *Inside No Stop City. Parkings résidentiels et système climatique universel,* Paris: Edition B2, 2017.
- Pier Vittorio Aureli, "More Money, Less Work: Archizoom". In EP Vol. 1 / *The Italian Avant Garde 1968-1976*, edited by Alex Coles and Catherine Rossi, 146-164. Berlin: Sternberg Press, 2013.
- Paolo Virno, *The Grammar of the Multitude. For an Analysis of Contemporary Forms of Life.* Los Angeles: Semiotext(e), 2004.
- Maurizio Lazzarato, "Immaterial Labor". In *Radical Thought in Italy: A Potential Politics*, edited by Paolo Virno and Michael Hardt, 133–150. Minneapolis: Minnesota University Press, 1996.
- Pier Vittorio Aureli, "OMA and the Politics of the Grands Projets". In *OMA. The First Decade - OASE* 94 (2015): 44-53.
- Antoinette Rouvroy, "Algorithmic Governmentality: Immune Strategy of Capitalism and Neoliberalism?" in *la Deleuziana* 3: Life and Number, 2016: 30-36.
- Pier Vittorio Aureli, "Labor and Architecture: Revisiting Cedric Price's Potteries Thinkbelt". In *Log* 23 (Fall 2011): 97-118.
- Clare Lyster, "Territories of Equivalence: Objects of the Logistical Apparatus". In *Footprint* 23, Vol. 12 (2018): 25-36.
- Jesse LeCavalier, *The Rule of Logistics: Walmart and the Architecture of Fulfillment*. Minneapolis: University of Minnesota Press, 2016.
- George Haynes, *Data Center infrastructure and Organization*. New York: Americana Press, 2016.
- Tim Wu, *The Master Switch: The Rise and Fall of Information Empires*. New York: Vintage Reprint, 2011.