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The Anthropocene Waterscapes of Venice

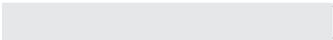
edited by
Pietro Daniel Omodeo
and Pietro Consolandi

The Anthropocene Waterscapes of Venice

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student



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The Anthropocene Waterscapes of Venice

edited by Pietro Daniel Omodeo and Pietro Consolandi

Abstract

This handbook is an interdisciplinary introduction to the Anthropocene, the epoch in which the combined impact of humans and their technologies on the Earth system is comparable to that of natural forces. To more concretely consider the historical, political, and epistemological conditions behind the Anthropocene, the handbook takes the water city of Venice, along with its cultural–natural ecology, as the paradigm of the ongoing geanthropological transformation of the planet. In connection with the educational program of the Department of Philosophy and Cultural Heritage at the Ca' Foscari University of Venice, the contributions herein reflect environmental humanities research, with an emphasis on hydrosociology, supported by the UNITWIN/UNESCO Chair on Water Heritage and Sustainable Development and the NICHE Centre for Environmental Humanities. The handbook contains a series of lessons, in which scholars with different backgrounds and disciplinary training examine the historical development of the human–nature relationship from multiple comparative perspectives. Unit One (four lessons) offers an overview of Anthropocene Venice, ranging from a discussion of riverine and aquatic mythologies to the history of water science and management, from antiquity to the industrial age. Unit Two (three lessons) deals with the general question of the Anthropocene, the genealogies of the concept, and its articulation as a problem of oversight and knowledge economy, including artistic vistas (e.g., bird's-eye view, vedute, and aerial photography). Unit Three (three lessons) is a comparative discussion of water cities – Venice, Tenochtitlán, and Bangkok – against the background of hydrophilia, the lasting connection between humans and aquatic environments in history. Unit Four (four lessons) explores the cultural politics of the Anthropocene, with a special emphasis on the following issues: the social underpinnings of science and technology, the mission of eco-artistic movements, resistance to the extractivism of material resources and cultural commons, and the struggles for the rights of nature against ecocide.

Keywords Anthropocene. Venice. Ecology. Hydrosociology. Water heritage. Water cities. Sustainable development. Environmental humanities. Geoanthropology.

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The Anthropocene Waterscapes of Venice

Preface

Francesca Tarocco

Director of THE NEW INSTITUTE Centre for Environmental Humanities (NICHE)

Pietro Daniel Omodeo

Director of the UNESCO Chair Water Heritage and Sustainable Development

Venice is our method.

We mean this in the quasi-literal sense of ‘method’ in its Greek composite, *metá* plus *hodós*, that is, the ‘path beyond’, a ‘way through’ – in our case, a wayfinding examination of the water lands of Venice. We hint, as well, at Venice’s capacity to exist beyond Venice. Its natural-cultural ecosystem opens up to broader geographies of a network of water cities – Bangkok, Tenochtitlán, Shanghai – its tidal rhythms to planetary interconnectedness. The flow of life, the lives and many niches that contain them, harbour the possibility of distant travel. There is also the specific nature of Venetian waterscapes and mentalities. Inner and outer, inflowing and outflowing. There is a dual movement of self-reflection: islands unto themselves, and an environment connected to the Alps, to Mediterranean shores, and to the Oceans.

Venice is also method in the genuine epistemological sense. Our exploration aims to deepen and expand our knowledge of the Anthropocene, a predicament in which humans and technologies act as geological forces of world transformation. This awareness calls for a novel alliance between disciplines. We hope to connect knowledge of nature to cultural studies and to the arts, contributing to the emergent field of environmental humanities. We also hope to foster an approach that is both subjective and reliable, and that is open to the acquisition of new knowledge. In this way we wish to achieve a ‘stronger objectivity’ – as feminist standpoint theory and historical materialism have taught us. The emergent field of environmental humanities benefits from critical thinking, which we cultivate as a precious asset of cultural studies. We do not consider critique to be a destructive practice for its own sake but rather a preliminary step for the construction of bottom-up knowledge and practices. A democratic attitude should foster a reconfiguration of natural-cultural paradigms, with a goal of non-technocentric responses to the planetary polycrisis – environmental, climatic, political. The stake of the current environmental turn in the humanities (and the corresponding humanities turn in the natural sciences) is to forge novel outlooks grounded in the aesthetic, ethical, and political experience of the places we inhabit. Going beyond bookish literacy, we embrace a close reading of landscape inscriptions. Hence, the environmental humanities finds application in a sense very different from top-down schemes. The environmental humanities should be rooted rather than implanted, a form of knowledge in action; a method, indeed.

Venice is a place of resilience. The Venice Lagoon was formed roughly 6,000 years ago during the Flandrian transgression, when the rising Adriatic Sea flooded the easternmost part of the Po River paleoplain. The lagoon environment has always been characterized by a pronounced and fast morphodynamics, inducing important morphological changes even over the relatively short time span of a few centuries. Today, Venice faces the risk of submersion as a consequence of climate change and other threats stemming from misconceived environmental pathdependencies. Its future depends on decisions too complex and too-deeply imbricated with ideals and imaginaries to be delegated to technical solutionists, not unlike other water cities in the world. The many voices of this volume share a prism of viewpoints on the lasting interaction between historical actors, species, and the elements of Venice. May this volume – the fruit of years of intense engagement with our aquatic territory, lasting conversations, transdisciplinary scholarship and friendship – contribute to finding a ‘passage beyond’, one that leaves no one behind.

01

Introduction

Pietro Daniel Omodeo
Director of the UNESCO Chair on Water Heritage and Sustainable Development

Notes

This handbook comprises a series of interventions, in which scholars with different backgrounds and disciplinary affiliations take Venice as a prism through which to observe the historical unfolding of the human-nature relationship from multiple comparative perspectives. Such a multi-vision is here brought together under the auspices of the UNESCO Chair on Water Heritage and Sustainable Development, which I direct at Ca' Foscari University of Venice and THE NEW INSTITUTE Centre for Environmental Humanities (NICHE), in close collaboration with the Department of Philosophy and Cultural Heritage of Ca' Foscari University of Venice and the Max Planck Institute of Geoanthropology in Jena. The many vistas here presented show the complexity of the Anthropocene, as well as the possibilities to gain relevant knowledge by means of collaborative and integrated approaches. This volume also offers insight into the many challenges of the Anthropocene both as a concept and as a reality, starting from Venice.

The Broader Picture

The water city of Venice has become a symbol of climate change and the global environmental crisis. We have become used to looking at the varying heights of the flickering mirror that surrounds Venice with growing concern. Memories of the *Acqua Alta* floodings of 1966 and 2019 occupy the collective imagery regarding the future of Venice, in spite of the construction of new technological defences such as the movable dams at the lagoon inlets. Water has never been a purely aesthetic element for Venice. In the Middle Ages and the Renaissance, the lagoon was the fluid wall protecting the 'serenity' of the Republic and a gateway for exchange with the Mediterranean and Eastern world. Today, water has turned into a threat; global sea-level rise threatens to submerge Venice's unique world heritage. Its future, as it seems, does not depend on decisions at a local level as much as on the capacity to coordinate international measures to counterbalance the human impact on the planet. The future of Venice and that of the Earth are indissolubly linked.

But this site, with its 1,600 years of history, is also a paradigm of resilience and sustainability, the capacity of human societies to adapt to mutable environmental conditions and co-evolve together with their ecosystems. Not only have the local habits, lifestyles, and mentalities been forged by geography, the environmental conditions are the result of past decisions, interventions, and anthropogenic path-dependencies. Human activity is deeply inscribed in the geomorphology. Labour, land-architecture, and canalizations have transformed the coastal lines as well as the rivers that descend from the Alps to the Adriatic Sea. The waterscape has been constantly engineered and redirected to better serve transportation and agriculture, provide energy (from ancient hydraulics to the electric age) and, above all, preserve the harbours of Venice from the infilling of sediment. The conservation of the lagoon is basically due to river diversion beginning in the sixteenth century. Moreover, the development of sophisticated knowledge about water, technology, and institutions made it possible for Venetians to adapt to the specificity of their territory and, in turn, transform it. This can be seen as an entwined natural-artificial process. Indeed, Venice is a complex ecosocial space that connects fishing

communities (present since its mythical origins) to the mercantile classes of medieval proto-capitalism, that draws together artistic-cultural elites of the Renaissance and the Gutenberg era, industrial workers of the twentieth century, and tourist pilgrims of the current consumerist age.

Venice with its cultural strata is a paradigm of the Anthropocene condition, which the Earth system and humanity have more-or-less officially entered since the mid-twentieth century. Human geological agency has become the main driver of the planet. Via an accelerating process of deep technological transformation, industrial societies have bid farewell to the Holocene by subverting the parameters of its existence. This transformation has almost certainly left durable traces in the layers of the terrestrial crust. A team of stratigraphers has long been seeking such evidence, the Anthropocene Working Group, a subcommittee on Quaternary Stratigraphy of the International Commission on Stratigraphy, and a part of the International Union of Geological Sciences. This pool of scholars has striven to identify global traces at a microscopic level that could serve as markers of the profound geological impact of humans on the Earth System. Independent of the rejection of the Anthropocene hypothesis by the International Union of Geological Sciences (IUGS) and the International Commission on Stratigraphy in March 2024 (for purely technical reasons), the question of the geo-anthropological nexus still haunts us. Far from an abstract Promethean relation between a mythical Man and a deified Nature, this interrelation is one of dialectical interplay. Indeed, the driving factor of the Anthropocene is technology which, in turn, has deep socio-economic roots; it is linked to human practices, political conditions, and forms of knowledge. As the historian of science Jürgen Renn has argued in *The Evolution of Knowledge* (2020), we ought to reconceive the history of science as a fundamental factor of world transformation in light of controversies over the Anthropocene. Therefore, the social conditions of science, its validity, applications, and goals, cannot be thought of in separation from the planet, as if humanity were an autonomous empire within a larger empire (*imperium in imperio*, according to philosopher Baruch Spinoza's expression). Given the existential threat of the ecological crisis, and given the widespread sense of urgency to transition to sustainable economies, the question of 'how' has become especially pressing. Critical thinkers such as Naomi Klein have pointed out that the main challenge is at once political and cultural, as much as it is scientific and technological, because regulations and new forms of inhabiting the planet ought to be devised. In particular, ecosocial thinkers such as John Bellamy Foster and Kohei Saito have argued that the gulf that increasingly separates urban consumption from the regenerative capacity of nature has to be bridged, at the cost of rethinking the fundamental structures of our societies. This also implies that we critically assess their origin and imagine alternative futures.

Zooming in Through a Series of Classes

This handbook builds on earlier work, in particular on the Anthropocene Campus that took place in Venice in October 2021, focused on the past, present, and future of water politics.¹ As much as this international forum deepened the topics of earlier campuses, which had been organized in various locations under the guidance of the Haus der Kulturen der Welt and the Max Planck Institute for the History of Science in Berlin, it also marked the beginning of a novel engagement with the controversies of the Anthropocene from the perspective of the environmental humanities, historical epistemology, and political ecology.

In 2022, we published *Venice and the Anthropocene: An Ecocritical Guide*, which was a snapshot of the collective sharing of experiences and ideas at the

¹ <https://anthropocenevenice.org/campus-2021/>.

Anthropocene Campus Venice 2021. Since then, new collaborations and research lines have been established. Among them, an alliance with the newly created Max Planck Institute of Geoanthropology in Jena, through the Max Planck Partner Group in Venice, *The Water City: The Political Epistemology of Hydrogeological Praxis*, and with the Anthropocene Commons network, which experiments with new forms of active pedagogy and research.

A research unit on Waterscapes has been working on the themes of this handbook for several years now, based at the NICHE Centre for Environmental Humanities Venice in connection with the UNESCO Chair on Water Heritage and Sustainable Development. The series of classes presented in this handbook mirrors the unfolding of our research. The handbook constitutes one step forward in our reflection on the constellation of problems linked to the Anthropocene controversies.

The classes of the MOOC are gathered into four units. In the first one, “Plunging into the Waters of Anthropocene Venice”, four scholars working on political mythology, classical studies, the environmental history of science, architecture and urban politics offer a general introduction into the *longue-durée* history of the interaction between humans and the elements from antiquity to the hydroelectric and industrial age in Venice and its waters. Unit two, “Anthropocene Vistas”, presents epistemological, philosophical and aesthetic considerations on the Anthropocene, linking the exemplary case of Venice to broader theoretical debates. Unit three, “Water Cities”, offers a comparative reading of the cultural-geographical, anthropological and historical-scientific dimensions of Venice in relation to other water cultures, from Mesoamerica to Southeast Asia. The last unit, “Cultural Politics and Ecosocial Troubles”, expands on the cultural-political challenges of the Anthropocene, in particular the consumerism evidenced by touristic extractivism in Venice, environmental activism (including its eco-artistic expressions), the impact of science politics on nature and society, and legal means to protect ecosystems, including debates on the rights of nature.

These classes are offered in a multi-media manner. They comprise the texts of this handbook as well as audiovisual materials on display on the teaching platform of Ca' Foscari University of Venice. In the videos, all the lecturers involved in this project introduce themselves, their approach (depending on the methodologies and disciplines that they mobilize), the topic of their classes, and the pertinent locations in the region of Venice. These self-presentations have an immersive character. They are sometimes noisy (wind, waves or traffic can be heard and seen in the background) or crowded. This is consonant with the aim to give a sense of the human-natural environment of Venice. The various lectures connect a textual part – which can be listened to or read in this handbook – and visual explorations. The images have been gathered during collective excursions to significant geoanthropological sites. Pietro Consolandi and Joe Sartorius artistically assembled them. The link between texts and images is not obvious, because we aim to trigger active and creative engagement on the part of the spectator. While listening and looking at the audiovisual classes, the student is stimulated to construct bridges and engage, both rationally and emotionally, with the topics, while maintaining critical distance and nurturing curiosity. I see this as an important pedagogic point: to develop a MOOC format that forces one not to passively absorb notions but rather to reflect and even question the framework and creatively move beyond it. One way to approach these classes is to first watch and listen to the video, then read the corresponding text in the handbook, engage with the mandatory reading of the class, and watch the video for a second time. The handbook also includes an essential glossary of key terms and concepts. At the end of each section – groups of three or four classes – students will have to pass a test of multiple-choice questions relative to the classes and the mandatory readings.

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Unit 1

Plunging into the Waters of Anthropocene Venice



02

Rivers, Water Mythologies and Venice

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Notes

This lesson opens a window onto the complex interactions between the human and the non-human in the history of Venice from a cross-disciplinary perspective. Rivers shaped the Venetian lagoon for millennia and created many of the islands that form the Venetian archipelago. Since prehistory this area was transformed by the interactive agency of rivers, the sea and humans. In the ancient world rivers were perceived as powerful deities with a will of their own. Greek and Roman myths tell of river gods fighting human heroes, reflecting human desire for mastery over the environment.

It is impossible to write a comprehensive history of water. Its manifold shapes and elusive nature spill out of every man-made container. Most of our planet is covered in water. Oceans and seas have captured the imagination of our transient species and defined entire communities. The Mediterranean world is full of cultures and identities shaped by their relationship with water. The history of Venice is a particularly salient example. It is a cliché to say that Venice was the queen of the seas. But few visitors to this unique archipelago realize that most of the islands of Venice were not created by the sea. They are, in fact, the product of the rivers that have flowed through this area for millennia and the human interventions that have followed in their wake.

This lesson opens a window on the complex interactions between the human and the non-human from a cross-disciplinary perspective combining history, geology, mythology, classical studies and cultural anthropology.

Before delving into the Venetian rivers, I must first give a general overview of rivers in the ancient world. There is a remarkable variety of water creatures and water stories in Egyptian, Greek and Roman mythology. Today we think of rivers as passive channels conveying water from the mountains to the sea, similar to engineered pipelines/waterways. But most people in the ancient world perceived rivers as divine beings that actively shaped the world. Such was the importance of freshwater streams that one Roman commentator, named Servius Honoratus, claimed that every spring was sacred.

It is well known that the first cities and urban civilisations developed in river valleys. From China and India to Mesopotamia, rivers have been crucial to human efforts to organize larger communities. There are many reasons for this, but the main one is the amount of fresh water that rivers provide for drinking, husbandry and agriculture. They provide protection against invaders and enable waterborne vessels to connect distant areas through commerce and trade. The sheer size and scope of rivers inspired awe and religious rituals of all sorts, from rites of passage to the votive deposition of swords, coins, and other objects, including human bones.

In ancient Greece, rivers were powerful deities that could change shape. They are usually depicted as hybrid beings, combining human and animal qualities. The most common type is the man-faced bull [fig. 1]. Bulls were perceived as large and powerful animals in the environment of the northern Mediterranean. In Homer's Iliad, Scamander, the river of Troy, turns into a raging bull and attacks the strongest Greek hero, Achilles. Angry over the death of his partner Patroclus, Achilles goes on a rampage, killing so many Trojans that their corpses obstruct the flow of the river. In an attempt to prevent further killing and the pollution of its waters, Scamander responds with a threat to Achilles: he will cover the hero's body with sand and debris deep beneath the waves. The river's raging current rises and drives

CLASS TIME:
CLASS ROOM:
PHONE:
EMAIL:

against Achilles, leaving him barely able to stand. The greatest of the Greek heroes of Troy then “sprang for the shore, and set off running swiftly over the plain, gripped by fear”. Achilles repeatedly struggles to escape the clutch of Scamander’s rolling waves, only to be saved by the divine intervention of Athena and Poseidon. Thus, in Homer’s vision, the divine river is more powerful than any mortal hero.

Another important river god was Achelous, the god of the largest river in continental Greece. He is usually depicted as a hybrid with the body of a snake, the horns of a bull and a human face. There are many representations of his struggle with the hero Heracles [fig. 2]. The two fought over a beautiful woman, Deianeira, and Heracles won the wrestling match by breaking one of Achelous’ horns. According to Sophocles, the river god eluded Heracles’ grip by changing into many forms: “a rambling bull, then a twisting snake with glittering colours, then again in the shape of a man with an ox’s face” (*Women of Trachis*, lines 11-12). As is often the case, Heracles’ labours represent various aspects of man’s struggles with the terrifying and violent aspects of the natural world. Consequently, the image of the hero driving Achelous into submission comes to signify projects that humans undertake to control a river, such as diverting its course. It is interesting to note that in one version, Achelous’ horn is restored, suggesting the natural property of a river to restore its shape. The analogy has a natural equivalent, as the ancients called a river bend a ‘horn’.

There are some indications that such projects took place in the ancient Veneto, the region of Venice. The Romans built several channels connecting cities and rivers. In ancient times, the Venetian lagoon was shallower because the sea level was two metres lower than today. According to the Roman author Pliny the Elder, writing in the first century CE, this marshy and amphibian environment was called the ‘Seven Seas’ and was navigable by boat from Ravenna to Aquileia. In most parts of the lagoon, the boundaries between sea and land were not fixed, but changed with the ebb and flow of the tides.

However, the area of Venice itself – in Roman times, before the founding of the city – was not surrounded by the sea on all sides as it is now. Pliny mentions several rivers in the area, but the most important ones were called Medoacus and Sile. The Medoacus (now the Brenta) dominated the southern part of the lagoon and the Silis (now the Sile) the northern part.

The Medoacus flowed through the Roman city of Patavium (Padua), probably as far as the Giudecca canal, which was formed by the river. It is likely that the famous Grand Canal was another branch of the river thousands of years ago. The etymology of Rialto that tourists hear today when they crowd the highest bridge in Venice is wrong. In Latin, *Rivus Altus* can mean either ‘high bank’ or ‘deep water’, and it is the latter term that proved more significant for this area in ancient times. The depth of the water was crucial for the first people to navigate the canal (now called the Grand Canal), which was originally fluvial (or riverine), not marine. The myth that Venice was founded by Roman consuls from Patavium in 421 CE is a later medieval fabrication. In reality, the Romans only used the lagoon for fishing, hunting and salt extraction. The first settlements appeared in the sixth and seventh centuries CE, well after the end of the Western Roman Empire. They were founded by migrants from the mainland in the northern part of the lagoon, on the island of Torcello, now an hour’s boat ride from Venice.

Rivers flood and erode areas of land, but they also deposit sediment that creates new land over time. The medieval city of Venice was built on islands that had been created by the process of river alluviation and sedimentation over millennia of prehistory.

The history of both Venice and Ravenna is an ideal case study for the agency of rivers. Unlike most other major Italian cities, Venice cannot boast of Roman origins. But it is very interesting to find historical sources saying that Roman Ravenna was very similar to modern Venice. According to Strabo, a geographer from the first century CE: “Situated in the marshes is the great city of Ravenna, built entirely on piles,

and traversed by canals, which you cross by bridges or ferry-boats”.

This natural position made Ravenna the capital of the Roman Empire during the turbulent period of migrations and invasions in the fifth century. Many visitors still go there to admire the beautiful Byzantine mosaics, but few realize that Ravenna was the equivalent of Venice in the ancient world. This is because the city is now several kilometres away from the sea. But how is this possible, when the level of the Adriatic Sea is now two metres higher than it was in ancient times? The rivers filled Ravenna’s canals, carrying tons of sediment that gradually raised the land and moved the seashore up to 9 kilometres away from the city! Venice itself was in danger of suffering the same fate in the early modern period, which is why the Senate of the Republic decided to divert all the rivers away from the lagoon in the sixteenth century and continued to reengineer the waterscapes of Veneto throughout the early modern period.

The two cities thus serve as ideal case studies for the agency of rivers and the sea. The Venetian islands were created by river activity over millennia of prehistory and were partially covered by rising sea levels, which expanded the lagoon into the shape we see in Venice today. Meanwhile, Ravenna was built on islands on the edge of the sea, but was gradually filled in by river sediments and is now a smaller city inland. The two cases vividly illustrate how rivers have changed the landscape of this area and how human agency has intervened as an additional factor to channel natural forces, e.g. through river diversions.

Rivers, then, are not passive bodies of water that flow meaninglessly into the sea. They are living streams that define the environment and change history. This is a challenge to engineering dreams of total mastery over nature and its flows. This is why the ancients perceived rivers as powerful deities with a will of their own, immortalized in a mythical struggle with human heroes such as Achilles and Heracles.



Figure 1 River Laos, Greek coin, 510-500 BC, private collection



Figure 2 Greek vase, around 530BC-500BC. Courtesy of the Trustees of the British Museum

Mandatory Reading

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03

Water Management in Early Modern Venice

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Notes

This lesson provides an overview of some key aspects of the transformation and management of the Venice Lagoon from the viewpoint of the history of science and technology, with a particular focus on the early modern period.

In 1715, the mathematician Bernardo Trevisan published a treatise entitled *Della Laguna di Venezia* (On the Venetian Lagoon). In this book, the author - a *patrizio* (patrician) of the Republic of Venice and one of the foremost hydraulic experts of his time - described and discussed the most important measures taken by the Serenissima (the 'Most Serene' Republic) in its centuries-long effort to preserve the fragile balance between land and sea on which its power and glory rested.

For the most part, this far from simple endeavour involved relatively small-scale but constant (and undoubtedly laborious) works such as periodical dredging and the building and maintenance of channels, *embankments*, and dams. However, when the need arose, Venice did not hesitate to undertake major works that, at the time when they were carried out, broke new ground in the development of the art of hydraulic engineering. Such was the case with the diversion of the course of the main rivers and streams that flowed directly into the Adriatic Sea from the mainland - and which often posed a serious threat to the very existence of the Lagoon.

Trevisan's book is embellished with an allegorical frontispiece that can be seen as a wonderful embodiment of the environmental challenges faced by Venice since its legendary rise from the ashes of the Roman Empire. In the engraving, two wrestling figures (a boy and a girl, representing the land and the sea) try to force each other back into their respective domains. Above them, the phrase *Opponesi elemento ad elemento* (Two elements oppose each other) leaves little or no doubt as to how the scene should be interpreted.

It is interesting to note that here, the land (that is, the boy) seems to prevail over the sea. This scene may look odd to our modern eyes, used as they are to associating Venice with the notorious flooding problems that afflict the city today. But the anachronistic 'reversal of power' depicted on the plate should not surprise us: when Trevisan published his book, the most pressing environmental threat to Venice was the shoaling caused by the sediments carried and deposited in the Lagoon by the inflowing rivers. Had the engraving been done today, the frontispiece would have been quite different, of course - with the girl taking rather harsh revenge on the boy for his past bullying. And yet, despite the frequent (and often dramatic) changes in the battlefield that have occurred over the centuries, in this seemingly eternal conflict between land and sea neither side seems to have prevailed so far; nor has it ever been in Venice's interest for either side to do so. In full accordance with this interest, Venice has always joined forces with the losing side and, from time to time, it has eagerly sought to avert the equally lethal risks of shoaling and submersion.

This prolonged effort had a series of interconnected consequences that have shaped Venice's history, fortunes, culture, politics, society, and - last but not least - its landscape. The 'hydraulic commitment' of the Serenissima also found a concrete and enduring expression at the political and institutional level, with the establishment, in the early sixteenth century, of the *Magistrato alle acque* (Magistrate for the Waters): a powerful and long-lasting office (it outlived the Republic itself and continued, albeit intermittently, until 2014), whose board of experts was responsible

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for water management in both the Lagoon and the *Domini di Terraferma* (the name given by Venice to its mainland domains).

And indeed, these experts proved to be equal to the task: in keeping with the solemn name of their institution, the water officers worked tirelessly to safeguard the Lagoon throughout its long existence. And (as a non-secondary consequence of this struggle) they also contributed to making the Republic of Venice a European hub for scientific and technological innovation. Specialists in hydraulics, mathematicians, engineers, geographers, natural philosophers, miners, explorers, craftsmen, even fishermen and carpenters: in that northernmost corner of the Mediterranean Sea, the interaction of scholars and technicians – of *theorists* and *practicians* – fostered unparalleled levels of knowledge and expertise in the mastery of water and understanding of the hydrological cycle.

On the ‘scholarly’ side, the most tangible result of this feverish exchange of ideas and experiences was that Venice trained and attracted many protagonists of early modern science and technology. Their names are well known to historians of science and hydrology: Benedetto Castelli, Geminiano Montanari, Bernardino Zendrini, Antonio Vallisneri, Jacopo Riccati, Giovanni Poleni, and Domenico Guglielmini, to name but a few. These savants, in turn, contributed to the strengthening of cultural institutions and projects that for a long time made the Serenissima the beacon of Italian research. Just think of the University of Padua, one of the main theatres of the Renaissance and one of the leading universities in early modern Europe; or, in Venice, of the *Giornale de’ letterati d’Italia*, which was the first journal in Italy to have a special section devoted to science (a section in which, not surprisingly, the study of waters occupied a far from negligible place). These and many other centres of knowledge were both the expression and the propulsive force of the fruitful combination of *praxis* and theory that allowed the Republic to successfully manage one of the most fragile hydrogeological environments in the world, preserving its changing balance – and its beauty – far beyond the natural limits of its existence. In fact, it was thanks to this constant effort that Venice was able to promote and carry out pioneering projects that in many cases pushed the boundaries of the state of the art in water and land management – and which, at the time of their accomplishment, aroused amazement and admiration across the continent. This happened, for example, when the European powers witnessed the completion of the titanic *Taglio di Porto Viro* (1600-04): an unprecedented hydraulic engineering work that diverted the main branch of the Po River to the south of the Lagoon, drastically altering the evolution of the Italian Adriatic coastline, with long-lasting effects that are still clearly visible today. Or, on the (unfortunately recurring) front of warfare technology, let us think of the *galeas per montes* (galleys through the mountains), an audacious feat carried out in 1439 – when the Venetians, relying on their absolute control of the hydrographic network of north-eastern Italy, succeeded in transferring a fleet of warships from the Adriatic Sea to Lake Garda to move battle against the invading army of the Duchy of Milan.

It goes without saying that these (and many other) enterprises were not achieved without cost or controversy. For Venice, the need to remain at the technological forefront of water management in order to survive meant a constant drain on its human, natural, and financial resources. In some cases, the projects were so ambitious and pioneering that the water officers – in an unpleasant, but rather understandable, act of prudence – refused to approve them, mainly because of the technological, environmental, political (and therefore financial) risks that they posed. Inevitably, the rejections came much to the dismay of the proposers. In 1712, for example, the Franciscan friar Vincenzo Maria Coronelli (1650-1718) – who was the official cartographer and Cosmographer of the Republic – submitted a plan for a diversion channel that would connect the Adige River to Lake Garda, in order to prevent the notoriously turbulent river from flooding the plains of Verona and the Polesine. After a heated debate among experts, patricians, and other authorities, the project was

ultimately rejected. Not only was it technically challenging and too expensive, but it was also diplomatically risky: the excess water released into the lake would have led to more water in the outflowing Mincio River and thus to potential flooding in the neighbouring and Habsburg-ruled territory of Mantua.

As a posthumous tribute to Coronelli's foresight and talent, his proposal became a reality more than two centuries after his death, in 1959, when the young Italian Republic completed the Adige-Garda diversion tunnel. On the other hand, it is a tribute to Venice's prudence that this new project, too, was (and still is) met with harsh criticism from many experts and the public alike. But such is the price of change - and for the same reason, it should not surprise us that many other actions promoted by the Serenissima throughout its history ended up triggering political, economic, environmental, and social problems both within the Republic and with neighbouring states. As is often the case in water management, fixing a problem in one place means creating other problems elsewhere - and Venice has learned this lesson all too well, to the point that what the city is facing today in terms of environmental challenges and public controversies (just think of the MOSE project, the recent system of mobile dams introduced to regulate the waters of the lagoon) is in many ways perfectly in line with this tradition. Indeed, in the stream of professional and public debates that arose from - and in turn, shaped - Venice's efforts to manage an ever-changing environment, we can find an anticipation of the complex tangle of issues that we are facing today at a global level.

From this point of view, the history of water management in the Venetian Lagoon and on the mainland has much to teach us about what approach to adopt when faced with environmental challenges, an approach that is not necessarily *natural*. In fact, Venice and its beauty have survived for so long precisely because the Republic learned to adapt to a changing environment. It preserved artificially - and therefore *unnaturally*, and at a great cost - a landscape that was and still is destined to disappear by shoaling or submersion, and turning into land or sea. Although the choices made have not always been the wisest, Venice has managed to survive. And as its history shows, *unnatural* does not necessarily mean *bad* for the environment or for us. Flexibility was and is the key: a concept that applies to Venice as well as to today's global community.

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04

Architecture and the Venetian Waterscapes

The Fresco Decorations of the Veneto Villas and the Anthropocene

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Notes

This lesson is dedicated to the residential architecture of the Venetian mainland and its fresco decorations, with the aim of offering insights into Anthropocene Venice through the artistic heritage of the Veneto Region in the sixteenth century.

The Venetians became real landowners starting from the fourteenth century, when they acquired by auction estates on the *terraferma*, that is, the mainland territories conquered by the Republic of Venice on the Italian peninsula. However, the abundance of natural watercourses in the area created many swampy wetlands and frequent flooding, making many of these lands unhealthy and infertile. For this reason, one of the most long-lasting Venetian magistracies was established, the Savi Esecutori alle Acque, or the Venetian Water Authority: founded in the early sixteenth century, it was responsible for major issues related to water management, such as controlling and limiting human abuse and modification of river and lagoon currents, performing operations to prevent damage caused by natural phenomena, and keeping canals navigable.

This was a challenging period for Venice. The doubling of the Cape of Good Hope by the Portuguese at the turn of the century and their opening of new trade routes with the East forced the Republic to accept the loss of its commercial monopoly over the European silk and spice trade routes; wars only exacerbated the economic crisis, especially the War of the League of Cambrai, between 1508 and 1516, whose main combatants were the Venetian Republic, the Papal States, and the French, with nearly every major power in Western Europe taking part in the battles at some point. The population growth after the recovery from the war increased the demand for a large and independent production of cereals, especially corn. Thus, the need to reclaim and cultivate as much swampy and inhabited land as possible became particularly urgent.

In 1556, in order to supervise the reclamation and irrigation of land, the Senate established the office of the *Provveditori sopra i Beni Inculti*, or Commissioners of Uncultivated Properties. Its tasks included the creation of land reclamation consortiums, the overseeing of agricultural development, and the compilation of a register of owners of water sources, with civil and criminal jurisdiction over usurpers.

With the *Beni Inculti*, the Republic finally made a real transition from a commerce-based economy to one dependent on land investments. The office was founded much thanks to the vision of Alvise Cornaro, a distinguished man of letters and celebrated patron of humanists, who also owned and managed many cultivated lands. His writings on the subject are still preserved in the Venice State Archives. Cornaro envisioned a new agricultural philosophy, which he termed *Santa agricultura*, meaning *Holy Agriculture*, and introduced in his treatise *De la vita sobria*, or *Discourses on the Sober Life*, published in 1558. He regarded nature as a valuable source of riches and health that should be managed by knowledgeable people in harmony with nature, thus stimulating patrician interest in agricultural investment. He emphasized its economic advantages and drew inspiration from the classical tradition and his own erudite Renaissance circle, including Giangiorgio Trissino, Jacopo Sansovino, Sebastiano Serlio, and Andrea Palladio, who were the forerunners of the new way of living and building on the Venetian mainland.

In the same years, the Renaissance architect Palladio worked with some of the

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most prominent noblemen to develop a model for a rural villa that would meet the vision and objectives of Cornaro's *Holy Agriculture*. Combining the principles of the new agricultural philosophy with the practical needs of the environment, he created a prototype of a dignified noble residence that would also be a successful management hub for the surrounding properties, with components such as pigeonholes, *barchesse* or service units, wine cellars, and water fountains. The control over the nearby waterways was an indispensable task for villa owners, crucial to ensure safe and profitable land management and animal breeding. The relationship between man and nature was therefore a major concern of villa life, and while the hydraulic engineers of the Beni Inculti were called upon to provide technical solutions to natural threats, the humanist view shared by the noblemen regarded humans as an inseparable part of nature, working alongside it and adopting clever technical solutions to achieve an ideal balance between the two.

It is not surprising, then, that man and his natural environment were a favourite topic for fresco decoration in the Veneto villas. Generally speaking, the subjects depicted adhere to the humanist concept of 'the villa as a microcosm'. This idea was derived from the ancient notion of 'microcosm and macrocosm' explained in Plato's *Timaeus*, according to which the same patterns of structure, creation and reproduction could be seen at all the levels of the universe, from the largest scale of the macrocosm to the smallest scale of all the elements that it contains. Architects and patrons thus viewed a villa's components and function as symbolic manifestations of the structure of the universe and of the workings of nature within it. Consequently, it was quite common to find in a villa's decoration subjects related to its environment, such as local plants, animals, and landscapes, as well as subjects more explicitly alluding to the villa-cosmos parallel, such as the four seasons, the four elements, and the seven planets.

Landscapes, commonly depicted within illusionistic architectural window frames, provide the most evident emphasis on the relationship between the villa and its surroundings; they are also a celebration of the villa's role as a true belvedere, evoking the ideal settings of the ancient Roman villas according to Vitruvius and Pliny the Elder. Landscapes had already played a prominent role in the earlier Veneto villas. At Villa Barbaro in Maser, in the 1560s, Paolo Veronese embedded images of ancient Roman ruins from the classical tradition in the lush greenery and waterways that accurately represented the surrounding area.

Landscape frescoes were first introduced in the Veneto with Alvise Cornaro's Odeon in Padua, painted by Lambert Sustris in the early 1540s, where they served the specific function of promoting his agenda of Holy Agriculture. Unlike their Venetian successors, these landscapes do not contain classical ruins or generic imaginary views of nature. Rather, they depict agricultural lands properly and peacefully cultivated by farmers, and natural water resources reorganized in such a way as to flourish. A water mill is depicted in a landscape in the Landscapes Room, in Italian, Stanza dei Paesaggi. The water mill was an instrument commonly used by Venetian engineers to raise and transport water, as documented in the illustrations in Daniele Barbaro's commentary on Vitruvius's *Ten Books of Architecture*, first published in 1556. Cornaro is thus glorified as an exemplary landowner, who promoted the agricultural efforts for the good of Venetian society.

Another common decorative theme is the four seasons, alluding to the cyclical nature of annual agricultural production. The seasons are often given iconographic attributes drawn from Ovid's *Metamorphoses* (II, 27-30) and *Remedia amoris* or *The Cure of Love* (XI, 187-8). Spring and summer are thus depicted as female personifications, spring crowned with flowers, summer accompanied by wheat. Autumn and winter are male figures: autumn is accompanied by grapes or an apple, while winter is old, bearded, white and frozen. This is how they appear in the dining room of Villa Grimani Molin in Fratta Polesine.

The seasons are sometimes arranged according to the directions of the cardinal

winds. The idea refers to the parallel between the annual and the daily cycles of nature, beginning with spring on the east wall, where the sun rises, through daytime, when the sun is in the south (summer), followed by sunset (autumn, west), and ending with night, when the sun is below the horizon (winter, north).

Other subjects allude to the villa's rural context. Corn and vines are frequently depicted as the most common fruits of the land, as in the loggia of the Villa dei Vescovi in Luvigliano and on the ceiling of the vestibule of Villa Emo in Fanzolo. In the latter villa, a personification of agriculture welcomes the visitors above the entrance portal; in Villa Grimani Molin, the same position is occupied by personifications of Ceres as agricultural abundance and Juno as the symbol of wealth. In Villa Barbaro, in the Stanza di Bacco, Bacchus dominates the ceiling with his vines, and Ceres appears with her crops.

However, it was the grotesque that became the predominant and ideal visual instrument for depicting iconographic concepts related to nature. This ancient Roman decorative art, creative and fantastic, with a highly symbolic potential, was recovered from the grottoes of Nero's Domus Aurea at the end of the fifteenth century and developed into an elaborate classicising, or *all'antica*, form of decoration by Raphael's school in Rome. The grotesques in the Veneto villas are seldom purely ornamental, but go beyond the simple selection of eye-pleasing plants and animals. In Villa Emo, grotesque combinations in two small rooms represent the four elements, with further allusions to the fertility and abundance of nature. In Villa Foscari 'La Malcontenta' in Mira, a grotesque emblem of time refers to the dynamic and active forces of nature, while an emblem of poetry with Apollo's divine music suggests that universal harmony participates in the natural process of creation.

In Villa Grimani Molin, on the ground floor, there are grotesques with mother birds and their offspring. The allusion to fertility and reproduction, and the choice of birds, which are commonly associated with the soul, emphasize the concept of the generation of man in a spiritual sense. The acanthus flower appears as a decorative leitmotif in the grotesques throughout the main floor. Inspired by its significance in Greek and Roman funerary art, it represents the continuity of life and its cyclical nature.

One of the most intriguing manifestations of the cultural and agricultural relationship of the villa and its inhabitants with the environment can be found in the main entrance hall of Palladio's Villa Badoer at Fratta Polesine, painted by Giallo Fiorentino around 1560. On the *piano nobile*, the main floor, above the rear window overlooking the garden, a river god immersed in a swampy landscape is an allegorical representation of the nearby Scortico River. In the same hall, two scenes with Diana and her hounds against a local landscape represent the hunting activity documented in the area, especially the hunting of birds, which appear in the frescoes. Diana, shepherds, nymphs, and satyrs are all protagonists of the poetic and theatrical genre known as *pastoralia* or *bucolica*. Pastoral fables would be discussed and recited in the refined atmosphere of Villa Badoer, which hosted meetings of the Renaissance Accademia dei Pastori Fratteggiani, or 'Academy of the Fratta Shepherds'. On the opposite wall, two nymphs playing music and a water nymph in a pastoral landscape allude once more to the bucolic ideal, and recall the concept of musical, natural, and cosmological harmony.

The iconographic representation of the adjacent scene is quite exceptional. Two bearded male figures are again immersed in lush greenery. The one on the right is a river god, leaning on the traditional attribute of rivers, a common classical Greek vessel called a *hydria*, from which water flows, and he has a typical long beard. The other figure is younger, his hair and beard are cut short, and he lacks a *hydria*: instead, he is immersed in a small puddle that seems to come from the stream of water pouring straight out of the older figure's *hydria*.

The two villas in the locality of Fratta, Villa Badoer and Villa Grimani Molin, were built as part of a project that depended on the recent formation of a nearby *gorgo*,

a natural freshwater spring that appeared sometime around the 1550s and was shared by the two households. Together with the area's natural and man-made waterways, this *gorgo* is marked on a map drawn in 1564 by two surveyors from the Beni Inculti, who were summoned to Fratta to design an important drainage canal and a 'canal bridge', a technical invention that would allow the water of this canal to physically pass under the Scortico River.

From the map we can conclude that the older river god in the fresco represents the branch of the Scortico flowing between the two villas, while the younger figure is a unique personification of the *gorgo* formed by the same watercourse a few years before the villa's construction.

This true iconographic invention is undoubtedly the greatest iconographic testimony to the efforts of a Venetian family from the lagoon to revive and dominate the mainland territories with resourcefulness, determination, and technical innovation.

The examples of villa fresco decoration discussed in this lesson fully reflect the challenges that Venetian patricians faced in their daily struggles with the local waterscape. From allegories referring to nature's cyclical rhythms to symbolic representations of local waterways, Venetians have always found ways to portray their connection with the environment.

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05

The Industrial Terraforming of the Lagoon

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Notes

This contribution explores the industrial transformation of the Venetian Lagoon and its surrounding river basins, examining how large-scale infrastructural interventions, from Roman centuriation to twentieth-century hydroelectric and petrochemical developments, reshaped this complex intertidal ecosystem. Centred on the creation of Porto Marghera and the role of actors such as Count Giuseppe Volpi and the SADE company, it traces the lagoon's evolution into a machinic, energy-intensive landscape. The text highlights how modern industrial ideologies and interventions, including the controversial MOSE project, have compromised ecological balance, contributing to pollution, biodiversity loss, and altered hydrodynamics. By contrasting these legacies with emergent, unintended ecological niches – like those in the Casse di Colmata – the paper advocates for rethinking Venice's hydroscape through submerged, multi-species perspectives. It argues that this historical-ecological reading can inform more sustainable futures amid climate change and anthropogenic pressures.

The complex environment of the Venetian Lagoon, in constant flux and in search of equilibrium in the face of growing challenges, represents an intricately woven intertidal ecosystem, a landscape where the symbiotic relationship between nature and humans continues to unfold. Far from being a pristine ecosystem, the lagoon is a meticulously human-managed water domain, the complexity of which is now exemplified by the movable dams known as MOSE (Experimental Electromechanical Module). The controversial project, completed in 2019 after more than 20 years in the making, consists of movable barriers located at the lagoon inlets to occasionally separate it from the sea (with an effective operational life span of just 50 years) and attempts to reconcile the lagoon's existence with the spectre of climate change and rising sea levels. Echoing the plight of the denizens of our planet, Venice's inhabitants grapple with the intricacies of a threatened microcosm, making Venice a profound *planetary allegory* (Bevilacqua 1998). Rather than an immutable historical treasure, as the message often sold to crowds of tourists suggests, Venice is in fact the result of intense historical transformations in both of its architectural and landscape rationalities. The state of apparent equilibrium conveyed by the perpetual cyclical water conditions of the lagoon that pervades the city is the result of a vast, radical, transcalar series of interventions carried out over centuries. All these efforts have sought to maintain an artificial state of nature, a man-made lagoon environment. This lesson looks at this complex reality through the lens of the history of landscape architecture and industrialization.

The works carried out on a geographical scale in the hydro-basins of the Veneto region have had a radical impact on the state of the Venetian lagoon, including the Roman centuriation system, the *acque alte* (upper water network) initiated by the Etruscans, the fourteenth-century *acque alte minori* (minor lower water network) built by the Venetian Republic in the middle plain, and the *bonifica* (reclamation works) of the nineteenth and twentieth centuries in the low plain. They all contributed to the survival of Venice and its lagoon functions. The resulting hydroscape represents the *longue-durée* of the Venetian territory, the carrying structure of both the identity and spatial qualities of the cultural landscape of what developed as the Veneto *città diffusa*, which could be translated as 'dispersed city'. Before the MOSE's radical changes, aimed at preserving the city of Venice to the detriment of its lagoon, the decisive operations that significantly altered the state of the lagoon took place mainly in the late nineteenth century. In the early twentieth century, the modern visions of scientists, engineers and architects, but also painters and writers, projected a different future: a vision according to which the Venetian *hydroscape* would become an *enviro-technical wetland*. Indeed, the

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mountains in the background would be transformed to exploit the rivers and use the water to produce mechanical and electrical energy, while the lagoon marshlands would be filled in to accommodate industrial production activities. In the early twentieth century, both the rivers and the wetlands were therefore used to bring Venice into the Modern Age (Harvey 1989, 12).

Behind the idea of the modern transformation of the lagoon and, to a large extent, the mainland river basins into a productive mechanical landscape stood the same ideology and the same individuals. Known as the Gruppo Veneziano, they were a group of high-profile Venetians led by Count Giuseppe Volpi (1877-1947), a prominent local entrepreneur and future Finance Minister of the Fascist government. Under his leadership, they spearheaded the establishment of the industrial area of Porto Marghera, along the fringes of the Venice lagoon. At the forefront of this endeavour was a company called SADE (Società Adriatica di Elettricità, that is, the Adriatic Electrical Company), which pioneered the construction of dams and hydroelectric power plants along rivers, particularly along the Piave. Giuseppe Volpi envisioned the simultaneous transformation of the lagoon into a productive platform and the Alpine valleys into energy reservoirs, articulating a grand vision in which 'millions of kilowatt-hours' extracted from the mountain waters would breathe life into the stagnant lagoon, transforming - in his words - a *laguna morta*, a 'dead lagoon', into a *laguna viva*, a "living lagoon" (Volpi 1939). The project aimed to address Venice's stagnant state, characterized by economic desolation and confinement, an issue dubbed *Problema Venezia*. The establishment of petrochemical refineries in a newly built industrial area transformed Venice into one of the most important shipping terminals in Italy, in accordance with modernist visions of development.

Designed by engineer Enrico Coen Cagli, the project (1917) sought to terraform the lagoon by reclaiming vast swathes of wetlands in Bottenighi (larger than Venice itself), primarily to accommodate the energy-intensive petrochemical processes and oil refineries that were in high demand. Once a thriving tidal ecosystem serving as a transitional habitat between *terra firma*, or land, and the tidal environment of the lagoon, the marshlands of Bottenighi were swiftly occupied by factories. SADE's expertly coordinated initiatives demonstrated the company's significant role in regional industrial development. With the advent of hydraulic turbines in the early nineteenth century, alongside advancements in the manufacture of electrical components, the new possibility of harnessing water played a pivotal role in the re-territorialization process, which was facilitated by new hydraulic infrastructures. The development of power generators and machinery and distribution systems dictated extensive geographical patterns that, over the course of the last century, have systematically orchestrated all facets of production, transformation, accumulation, and distribution of resources, moulding the urban landscape of Veneto.

The SADE company controlled the production and distribution of energy across various Italian regions from 1905 until the nationalization of the electricity industry in 1963. The 'Volpi' thermal power plant, a coal-fuelled infrastructure, was built in 1926 to supply the growing industrial area of Marghera (later damaged by bombs during the World War II). By 1928, nearly sixty companies had set up their factories in the burgeoning industrial complex of Porto Marghera, which experienced exponential growth driven by the escalating demands of World War II. In this context, Marghera was envisioned as a pivotal point, receiving Alpine hydropower, and providing key petrochemical materials, serving as an industrial engine for the Italian Po Valley and a bridgehead to the Balkans and the Mediterranean. In this role, Porto Marghera was to become the counter-landscape of the Alps, the hydroscape of the mountain valley of the Piave River, the reciprocal landscape of the Venetian Lagoon.

In addition to land reclamation, this vision was made possible by major excavations across the lagoon to create a network of deep navigable canals. Among these, two had the most significant impact on the lagoon environment. Firstly, the 'Vittorio Emanuele Canal', dug in 1926 and widened after World War II, served the first phase

of the industrial project envisioned in 1917, designated as Industrial Zone I, covering 500 hectares. This operation was followed by the realization of Industrial Zone II, approved by the Fascist regime in 1925, and of the third area, Industrial Zone III, after the war (1963-69) (for another 1700 ha in total), strategically built on elevated terrain, protected against the ebb and flow of tides by the accumulation of dredged lagoon bed material and sediments. The subsequent excavation of the *Canale dei Petroli* (Malamocco-Marghera Channel) in 1968 further facilitated the navigability of the lagoon for industrial purposes, fostering economic growth based on petrochemical production, despite the environmental, health and safety hazards associated with it. This was accompanied by the reclamation of other relevant areas, such as the island of Tronchetto (1958) and the reclamation of wetlands in San Giuliano (1957).

The third zone of the envisioned industrial area ultimately remained largely undeveloped, a departure from the patterns observed in the first two zones. This can be attributed to significant interruptions and events that altered the trajectory of development. In the mid-1970s, in the midst of the 1973 oil crisis and the Yom Kippur War, a paradigm shift occurred. The prevailing systems were questioned, leading to discussions on ecology and the exploration of alternative energy sources beyond oil. At the same time, concessions in mountainous regions were halted, particularly for hydroelectric power. However, events such as the Vajont disaster in October 1963 and the nationalization of hydropower in the same year, followed by a severe flood in 1966, marked a turning point. These calamities underscored the hubris of unbridled technological domination of nature.

The construction of Porto Marghera ultimately had a profound impact on the lagoon ecosystem, causing extreme pollution and exacerbating the erosion of the seabed. Activities involving hazardous chemicals contributed to the environmental degradation due to inadequate regulation. The alteration of the direction of currents and the speed of the tides entering the lagoon from the Lido inlet, the digging of navigable channels (in particular the *Canale dei Petroli*), both physically and conceptually disrupted the equilibrium between the lagoon's inner 'basins' and the breaches of the conservation regulations, changing the balance between saltwater and freshwater marked by the so-called *parti-acque*, or watershed. Together, these events reshaped the industrial landscape, revealing the need for sustainable practices and environmental stewardship.

Today, the *Casse di Colmata*, artificial islands reclaimed from the lagoon and filled with soil dredged from the excavation of channels, stand as an example of environmental diversity, with mud, sediments, clay and tidal fluxes, while maintaining connections to the mainland. On those that have been abandoned and have never hosted industrial settlements, life has flourished in unexpected ways. The nature of the soil has led to a proliferation of species different from those native to the marshland. From the 1970s to the present day, the ecosystem has faced challenges such as saltwater intrusion and shifting currents, making it a hybrid site within the Venice Lagoon. While some *Casse* remain unmanaged, others are equipped with pedestrian walkways and birdwatching facilities. Notably, *Cassa di Colmata A*, which is uniquely connected to the mainland, supports specific biotopes and vegetation patterns conducive to the development and establishment of certain species. It is part of the Integrated Fusina Project, which has garnered attention from various institutions and is now recognized as Site of National Interest (*Sito di Interesse Nazionale* or SIN) for its unique species and vegetation. Managed for industrial purposes by the waste disposal company Veritas under concession from the Italian state, it boasts a network of channels for water distribution and phyto-depuration. *Cassa C*, located within the Municipality of Mira, suffers from invasive plant species, particularly *Baccarispilularis*, or 'coyote brush', whose uncontrolled growth threatens the native flora. Tidal creeks and internal lakes, some freshwater and some saline, promote extreme salinity levels similar to desert environments, which in turn support unique species adaptations. These environments also provide space for non-native bird species to thrive.

The legacy of the industrial area of Porto Marghera, its ongoing functioning, requirements and externalities are intertwined with those of the MOSE, as well as with freight transport and the extractive tourist cruise industry. The lasting effects of modern and post-modern activities, marked by significant ecological changes, increased water currents and salinity, including the erosion of the lagoon bed, resulting in a decrease in oxygen levels and a loss of aquatic life (as by reported by local fishermen), make the vision of Venice as a brackish lake, deprived of its peculiar geomorphology and its more-than-human realms, clearer every day. The top-down approach to decision-making that has been adopted so far neglects local ecological knowledge and critical multi-species existence. Conditions such as those of the *Cassa di Colmata* may suggest the need to embrace an alternative, *submerged perspectives*, to challenge technocentric modernity and to offer alternative ways of knowing and relating to land and water (Gómez-Barris 2017), alternative ways of knowing, feeling and being in a renewed relationship between land and water. By dissecting industrial legacies through situated *submerged perspectives*, both in the lagoon and across the seemingly distant hydroscares of rivers so related to its condition, we can extend Venice's *longue durée* and encourage the envisioning and flourishing of other futures.

To sum up, this historical-ecological overview of the transformation of the Venice Lagoon and its hydrographic basin into an industrial environment exemplifies the deep Anthropocene transformation of large ecosystems. In particular, it has focused on the modern legacy of the city's industrialization, including the changes affecting both wetlands and river basins, to explore the interconnectedness of these environments, which can be seen as reciprocal landscapes. The lesson encourages reflection on how we relate to the resulting ecosystems in the ongoing struggle to balance human and more-than-human needs with environmental conservation in the evolving context of climate change.

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Unit 1 – Glossary

Notes

Domini di Terraferma	(‘Mainland Domains’): the territory of the Republic of Venice in the Italian mainland. At their greatest extent, the Domini di Terraferma included present-day Veneto, most part of Friuli-Venezia Giulia, and the Eastern part of Lombardy (up to what nowadays is the Province of Bergamo).
Dredging	The removal of material (weeds, gravel, mud, rubbish, etc.) from the bottom of a lagoon, a lake, a river, or other waterbodies. Usually, the main purpose of dredging is to clear the bed of a body of water in order to improve its navigability, drainage, and water quality.
Embankilometresent	An artificial mound or bank which is typically made of earth or stone. In hydraulic engineering, embankilometresents are typically used to hold back water.
Giornale de’ Letterati d’Italia	The first Italian journal featuring a specific section devoted to science. It was established in Venice in 1710 by Scipione Maffei (1675-1755), Antonio Vallisneri (1661-1730) and Apostolo Zeno (1668-1750). The journal ceased publication in 1740.
Magistrato alle acque	(‘Magistrate for the Waters’) a bureau of the Republic of Venice whose board of experts was responsible for water management in both the Lagoon and the Domini di Terraferma. See “Savi ed esecutori alle acque” below.
Shoaling	The formation of shoals (i.e., sandbanks, or sandbars) in a waterbody. During the early modern period, shoaling became a frequent environmental threat to Venice, because of the sediments carried and deposited in the Lagoon by the inflowing streams.
Water diversion	In hydraulic engineering, this term refers to the act of redirecting the flow of a waterway (like a river or a torrent) through artificial channels, dams, and other purpose-built structures.
Terraferma	The mainland territories conquered by the Republic of Venice in the Italian peninsula.
Savi ed esecutori alle acque	The Venetian water authority, founded in the early sixteenth century, in charge of large-scale issues related to water management, such as controlling and limiting human abuse and modifications of river and lagoon currents, performing operations to prevent the damage provoked by natural phenomena, and maintaining the ability to navigate within the canals. It became later known as Magistrato alle acque.
Provveditori sopra i beni Inculti	‘Commissioners of Uncultivated Properties’, an office established by the Venetian Senate in 1556 for the supervision of land reclamation operations.
Santa agricoltura	‘Holy Agriculture’, the new agricultural philosophy envisioned by Alvise Cornaro (1484-1566) in mid-sixteenth-century Venice, which regarded nature as a precious source of riches and health that should be managed by knowledgeable humans, in harmony with nature.
Grotesques	An ancient Roman decorative art rediscovered during the Renaissance, which became a widespread, eye-pleasing and symbolic theme for fresco decoration, merging and connecting natural and fantastic elements and figures against a neutral background, as an utmost visual celebration of nature’s marvels.
Bonifica	Refers to land reclamation efforts in Italy, particularly in the context of transforming marshlands and wetlands into arable land. It plays a significant role in the industrial and ecological history of Venice.
Casse di colmata	These are artificial islands created from dredged material and sediments, primarily intended for industrial use but later contributing to both environmental degradation and biodiversity in the lagoon ecosystem.
Città diffusa	An Italian term used to describe the ‘dispersed city’, referring to the spread-out structure of settlements in the Veneto region, reflecting the complex interplay between urbanisation and the Veneto’s territorial structure.

Modernity

“The Modern Age is here understood as the period in which the scientific domination of nature began to be exercised through an extraordinary intellectual effort encouraged during the Enlightenment period, and ‘brought human emancipation [...] freedom from scarcity, want, and the arbitrariness of natural calamity” (Harvey 1989, 12).

MOSE

(Italian: Modulo Sperimentale Elettromeccanico; English: Experimental Electromechanical Module). This term refers to a system of movable barriers designed to protect the Venetian Lagoon from flooding due to rising sea levels and high tides. It is a key infrastructure in managing the delicate balance between the lagoon and the sea.

Unit 2

Anthropocene Vistas

06

Patterns of Interconnectedness: Venice Is Not Alone in the Anthropocene

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Notes

This essay explores the interconnectedness of environmental phenomena in the Anthropocene through the lens of Venice's waterscape. It argues that climate change, biodiversity loss, and extreme weather events transcend national borders and must be approached systemically, combining natural sciences and the humanities. Using Venice and St. Petersburg as symbolic case studies, the text highlights how historically cosmopolitan water cities face parallel challenges—rising seas, infrastructural limits, and governance failures—that reveal broader global patterns. Drawing on planetary thinkers like Vernadsky and Chizhevsky, the essay calls for scalable, interdisciplinary approaches to environmental governance that connect the local with the global.

On 12 November 2019, Venice was hit by a flood that resulted in a tidal rise of 187 cm, one of the most dramatic water rises in the city's recent history. In 2020, COVID-19, which broke out in 2019, was declared a global pandemic with devastating effects not only on human health and mortality, but also on every aspect of human well-being, psychologically, socially, politically and economically. COVID-19 was strongly linked to other phenomena: to mention just two, global warming and deforestation have acted as indirect drivers of the global spread of the virus, as habitat loss forces animals to migrate, potentially coming into contact with other animals or humans, creating opportunities for pathogens to enter new hosts.

In May 2022, the Mediterranean experienced the longest heatwave on record for 40 years, with sea temperatures rising by up to 4°C and peaking at over 23°C. This has already been associated with extreme phenomena such as torrential rain, floods, and storms in much of Europe. At the same time, other parts of the Earth, such as Pakistan, also experienced extreme events, leading - among other things - to severe crop failures. The environmental crisis took on devastating proportions in those areas, affecting the production and export of wheat, and thus the country's economy and poverty levels. As if that were not enough, these phenomena are linked to social rebellions and conflicts that, contrary to what many governments still think, are becoming a matter of global security. In Venice, as in those faraway places, the hazardous events that resulted in socio-ecological disasters were caused by a complex combination of factors. The large atmospheric low pressure over the Mediterranean and the associated sirocco wind blowing over the Adriatic were partly responsible for the high water levels in Venice. Sea level rise is clearly due to rising global temperatures, which cause glaciers to melt, so this chain of events and processes ultimately played a role in lifting the water out of the lagoon. But there is another factor to consider: the astronomical environment, because the biosphere and the hydrosphere are not separated from their outermost environment, cosmic space. The winds, and in particular the sirocco that blew across the Mediterranean, coincided with one of the tidal peaks of the full moon (The ISMAR Team 2020).

What I am trying to imply with these examples of the human-environment nexus is that environmental phenomena today cannot be understood only as arising from local conditions because they are often the result of the activity of interconnected processes that have occurred at different levels. This means that only a systemic perspective can capture what's common to these interrelated processes. Climate change, biodiversity loss, melting glaciers, heat waves and other extreme events can produce effects that transcend national borders contributing to cascading accidents in remote areas, with consequences that reach far beyond local geographies. Local changes are at the same time bringing about an overall change in the Earth's

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functioning that does not only affect one or the other ecosystem - the biosphere or the cryosphere - but is deeply systemic and complex, and as such must be approached and investigated with equally systemic methods, resulting from the dialogue and integration of different disciplines, where the sciences can interface with the humanities.

Earth upheavals must also be understood as the result of a cultural, social, political, and economic history that has characterized and shaped our societies. The reverse is also true: geophysical factors are historically correlated with biological and social phenomena. In the first half of the twentieth century, this correlation was a preoccupation of the Russian physician, biophysicist, and heliobiologist Alexander Chizhevsky, who explained in his book *Physical Factors of Historical Processes* (1924) that geophysical processes have an influence on human history.

He argued that there are correlations between periods of increased solar activity, such as sunspot cycles, and increased levels of unrest, revolutions, wars, and epidemics throughout history. By compiling statistics on 'biospheric' processes and their relationship to solar cycles, he came to see geophysical factors as intimately linked to human factors and invited not only historians but also scientists to rethink their methods of studying the thermodynamic basis of the biosphere. He based his assumptions and analysis on the idea of co-evolution between the different spheres of the Earth, rather than a co-determining relationship in which nature determines the fate of humanity in a monocausal way. Chizhevsky adopted a systemic approach that was deeply rooted in the rich and long-standing Russian and Eastern European tradition in biogeochemistry and Earth sciences, an approach that would be taken up, for example, in the more mature developments in global ecology and biosphere studies in the second half of the twentieth century, when the notion of the global environment emerged as an object of both science and global politics.

Indeed, drawing on the work of naturalists, philosophers, and geologists such as Vladimir Vernadsky, George Perkins Marsh, and Antonio Stoppani, who investigated the role of humans as agents of planetary change in the late nineteenth and early twentieth centuries, scientists and humanists in the last two decades - encouraged by the debate launched by Paul Crutzen and Eugene Stoermer in 2000 - have addressed the 'Anthropocene' as a concept that helps to overcome the dualism that in the past separated nature and culture, the environment and society, the anthroposphere and the geospheres. Indeed, Anthropocene scholars like Jan Zalasiewicz, Will Steffen (who recently passed away), and Jürgen Renn have considered elaborating a global systemic approach that proposes a co-evolutionary interpretation of human and cultural formations with biogeochemical processes involving the interaction of different parts of the Earth. Thus, a geohistorical, geocultural, and geoanthropological view of the evolutionary history of organisms - including the powerful geological force of humanity - and the environment is the basic approach to understanding the Anthropocene, its predicaments and the responsibilities it entails (Renn 2020). Although the Anthropocene refers to a notion of a global environment that envelops the Earth, it is not a notion that neglects or homogenizes the diversity of the Earth's territories and local issues.

These issues have also been tackled from the perspective of global environmental policy and governance. Simon Dalby, Professor of Geography and Environmental Studies, has examined the climate and environmental crisis in terms of the transnationality of these phenomena. In his recent book, *Anthropocene Geopolitics*, he argues that climate and environmental problems are transnational phenomena that require a new understanding of borders in the Anthropocene (Dalby 2020). That is, most security and environmental policies continue to be based on outdated notions that look back to a time when geopolitical threats stemmed mainly from the rivalries of states with fixed borders. Instead, the geopolitics of climate change demonstrates that security policy must look forward to rapidly shaping a sustainable world that is no longer dependent on fossil fuels, a turning point that will benefit humanity

globally. As we saw at the beginning of this text, environmental problems affect all of humanity in one way or another. Climatologists such as Ricarda Winkelmann are studying the rapid and irreversible cascades of changes known as 'tipping points' in the climate system, i.e. 'points of no return' or thresholds that, if crossed, will have a domino effect on various socio-environmental systems. Tipping points increase as the Earth's temperature rises, amplifying global warming and its effects in a feedback loop. For example, the melting of glaciers, especially the Arctic sea ice and the Greenland ice caps, not only reduces the albedo effect, but also raises sea levels, contributing to the risk of extreme events such as the flooding and inundation that plague Venice and other water cities around the world.

According to Dalby, new concepts such as 'planetary boundaries' should act as a trigger to redefine, for example, the geopolitical interpretation of the Anthropocene problem. Global politics is not yet concerned with the patterns of interconnectedness of these phenomena. Global politics is still interested in protecting borders and national sovereignty. In a sense, sovereign states still have the choice of whether or not to adhere to environmental protocols, treaties that limit the use of certain substances, or international agreements that regulate carbon emissions. Dalby claims that the displacement of environmental phenomena has made it clear that classical geopolitical thinking, which once suggested that climates in different parts of the world determined the fate of human communities, is now backwards; geopolitics now shapes future climates, not the other way around.

In the early twentieth century, geochemist and mineralogist Vladimir Vernadsky used the concept of *living matter* to explain that the biosphere has no defined geographical boundaries. Its extent is defined by the scale of observation; hence there is nothing large or small in nature. The ubiquitous role of the biosphere in shaping the Earth is based on its ability to perform a global biogeochemical function involving the transformation of every element that touches the soil, evaporates into the air, and falls into the ocean.

Venice, the City of Canals, has long captured the global imagination with its magnificent architecture, rich history, and unique way of life. However, beneath its picturesque façade lies a city struggling with systemic issues that intertwine its past with the current environmental crisis. With all the environmental problems that Venice must deal with, often unsuccessfully, the lagoon city is a good example of the transversality of certain phenomena. Since its urban and architectural development, Venice has been a crossroads of economic and cultural exchange. Founded over 1,500 years ago on a network of marshy islands in the Venetian lagoon, the city grew into a maritime power that dominated trade routes and shaped European commerce for centuries. Its wealth and influence were built on a mastery of water, with the Venetians building an intricate system of canals, bridges and palaces that won the admiration of the world. Venetian-born architects such as Giacomo Quarenghi left Italy for St. Petersburg, where their talent and experience helped to create some of the most iconic buildings and monuments of Tsarist Russia. Venice has always been a deeply cosmopolitan city, a bridge between East and West, as Amitav Ghosh argues.¹ But it is this relationship with water, which once defined Venice's prosperity, that now threatens its very existence. The systemic aspects that link Venice's past to its current environmental crisis are many. Centuries of human intervention, from land reclamation to the construction of palaces, have altered the delicate balance of the lagoon's ecosystem. Meanwhile, modern infrastructure projects, such as the MOSE (Modulo Sperimentale Elettromeccanico), a flood barrier system designed to protect the city, have been at the centre of heated debates and scandals. Cost overruns and allegations of corruption have highlighted issues of governance and accountability. Most importantly however, scientists have analysed the impact of

¹ <https://milanodabere.it/senza-categoria/amitav-ghosh-venezia-porta-tra-oriente-e-occidente/>.

the MOSE barriers on the morphological evolution of the lagoon, showing that the repeated and prolonged use of the gates threatens the future of the salt marshes (*barene*), which are crucial for maintaining the integrity of the ecosystem and providing so-called 'ecological services'. Last but not least, Venice's *hypertourism*, as Robert Davis called it, has fuelled its economy but also contributed to environmental degradation. The influx of visitors generates waste and disrupts fragile ecosystems, exacerbating the city's ecological footprint (Davis 2022). As the city grapples with the consequences of its past and present actions, it stands as a microcosm of the broader challenges facing coastal communities worldwide in an era of climate change and in a new epoch of anthropogenic significance. Indeed, Venice's environmental problems are similar to those of other cities around the world, such as Amsterdam, Hamburg, Los Angeles, and St. Petersburg, known as the 'Venice of the North' for its network of canals and bridges, which is now facing its own environmental predicament. The Russian ethnologist and anthropologist Lev Gumilëv argued that civilizations are not isolated entities, but are linked by trade, migration, and conquest. Cultural exchange between different peoples facilitates the spread of ideas, technologies, and social practices, leading to the enrichment and transformation of cultures over time. It is not surprising, then, that Venice is not alone, for better or for worse. Unfortunately, the similarities between the two cities also concern the most emblematic aspects of the global environmental crisis, serving as iconic examples of the Great Acceleration of the Anthropocene. Like Venice, St. Petersburg is threatened by flooding and erosion. Both cities rely heavily on tourism, which contributes to their economic vitality but also strains their ecosystems and infrastructure. In addition, both cities face similar problems in terms of the technological solutions that should be used to regulate water levels. One of the most important projects to protect St. Petersburg from flooding is the St. Petersburg Flood Protection Complex, commonly known as the St. Petersburg Dam. Although it provides essential protection against flooding, it is not without controversy. Critics have raised concerns about the dam's environmental impact, particularly its potential to disrupt the natural flow of water and sediment in the Neva River delta. In addition, there have been debates about the effectiveness of the dam in the face of increasingly severe weather events and rising sea levels associated with the worsening global climate change and environmental degradation. Similar criticisms have been levelled at the MOSE, so it seems that not only are the causes of certain environmental and atmospheric phenomena similar in different parts of the world, but so are the engineering strategies that have been put in place to mitigate these phenomena. Efforts to limit sea level rise, preserve cultural heritage, and promote sustainable tourism do not appear to be coordinated and concerted at the local, national, and international levels. At the same time, it does not seem as though innovative engineering solutions have been coupled with effective environmental governance that takes seriously the engagement of local communities, the history of water cities, the interdisciplinary collaboration between the sciences and the humanities, and the perspectives of conservationists, environmentalists, and archaeologists. In this sense, an aggregated expertise that shapes an idea of the environment as a global and interconnected complex should probably override short-sighted solutions that tend to focus on addressing immediate, localized issues without considering broader systemic or long-term implications. Today, much emphasis is placed on local contexts, identities, and the protection of specific sites, but this commitment makes little sense if we miss the global picture and do not consider the reciprocal evolutionary relationships between the local and the global that have forged these identities. Scalability is the key to understanding the environment in the Anthropocene, where the microscopic is linked to the macro, and the regional to the Earth.

With this short essay, I have tried to emphasize the importance of a comprehensive, systemic view of environmental phenomena, which is also inspired by the approach and legacy of Russian systemic and planetary studies. Moreover, I have

used the symbolic comparison of Venice and St. Petersburg to highlight the global evolution of a cultural phenomenon that is unfortunately revealing its dark side today in the context of such a global environmental crisis brought about in and by the Anthropocene.

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07

Economic Activity, Life, and Knowledge in the Anthropocene

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Notes

This lesson is based on an interdisciplinary perspective that draws on anthropology, philosophy, and history. The purpose of the lesson is to examine the interconnections between the following three concepts: economic activity, economic life, and the knowledge economy. More specifically, I would like to show how material economic activity intersects with social economic life, and how both depend on knowledge economies to deal with environmental contingencies. This discussion is framed in relation to the potential anthropogenic ecological disaster often subsumed under the concept of the Anthropocene. After offering some theoretical considerations, the lesson concludes by discussing why Venice is an invaluable epistemic resource for understanding these concepts in practical terms.

1 Economic Activity

In the broadest and simplest sense, *economic activity* refers to the reproduction of the *material base* needed for human survival and flourishing. The material base includes resources, tools, and commodities. At the same time, it is nothing without human beings, who, in addition to consuming the material base, perform the indispensable work of replenishing and expanding it. This work does not happen naturally but requires arrangements for pooling, exchanging, and using things. In addition, by replenishing and expanding the material base through work, human beings themselves become material components of this base, which means that the reproduction of people is part of the reproduction of the material base. Such reproduction is never a matter of mere procreation and involves an entirely new layer of social institutions, which, in turn, condition and are conditioned by everything from exchange and work to consumption and replenishment. Thus, we see that even in the simplest sense, economic activity is already quite complex. In the epoch of a potential anthropogenic ecological disaster, the complexity of economic activity passes into sheer contradiction: the reproduction of the material base, in addition to being a necessary condition of continued existence, becomes the driver of possible human extinction.

To make sense of the complexity (though not the contradiction) of economic activity, economic theory often resorts to formalization – that is, to describing something in abstract and mathematical terms. The advantage of formalization is the ability to use the resulting formal schema in diverse settings regardless of the specific context. This is potentially beneficial to governance institutions, which must establish general interests among many competing parties, each with its own situated perspective. One of the most prevalent formalizations of economic activity involves modelling individuals as rational agents who seek to maximize individual utility under conditions of scarcity and competition in markets driven by the logic of supply and demand. In recent decades, after several shocking but predictable market crises, disconcerting growth indicators among developed and developing nations, and persistent extreme wealth inequality, the limits of this model's explanatory power can be reasonably questioned. What if, for example, economic actors are only partially rational on the best of days, driven not by competitive and innovative instincts but by a strong preference for comfort and habit at any cost, along with desires whose maximization frequently tends toward the self-destructive?

In addition to questions of what kind of human nature a model presupposes and how this affects modelling outcomes, the reproduction of the material base entails the *social reproduction* of society. Economic activity is never only a matter of

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transactions in markets but of living in collective, cultural environments with complex provisioning mechanisms. Furthermore, the Anthropocene is a clear reminder that societies are not homeostatic, self-referential systems. Instead, economic activity involves *living in a world* that exceeds societal boundaries and practices, necessitating the development of knowledge economies. Therefore, to get a fuller grasp of economic activity, we must consider economic life and knowledge economies.

2 Economic Life

Besides economics, various other disciplines, such as political economy, cultural sociology, and social history, have proposed alternative explanations of economic activity. To move beyond economic formalism, the concept of *economic life* from economic anthropology is particularly useful. Economic activity is never separate from the division of labour, social stratification, cultural customs, and linguistic codes of the collectivity in which it takes place. Simply put, there is no economic activity without a society that enables and mediates this activity. Even the most formal economic models are enacted through *substantive societal actions* that involve laws, institutions, and languages as well as individual desires, motivations, and biographies. None of these categories are abstract – they all have determinate historical content that is particular to specific communities.

However, whereas formalist interpretations of economic activity tend to become detached from their social substance, the concept of economic life can all too easily convey a hermetic, siloed image of economic activity whereby human beings appear to live in enclosed communities strictly circumscribed by the circulation of their own customs and linguistic codes. In actuality, economic life is nowhere as bounded as the cultural structures identified by anthropologists would imply. Floods, droughts, and earthquakes interrupt natural cycles, migration and trading introduce new customs, and technological innovations shuffle societal arrangements. With the concept of economic life, the *living* component of economic activity is foregrounded, while *the world* in which this living takes place remains in the deep background. But just as economic activity is inseparable from society, so is economic life always conditioned by the world and its natural environment.

3 Environment

How can we talk about the world and its natural environment without falling into empty generalizations and abstractions? On the one hand, the environment never confronts us in its pure form – that is, devoid of human signification and meaning. We always make sense of the environment using the tools, customs, and codes on hand. At the same time, certain expressions designate places of encounter on the border of the cultural circle, where the line that demarcates a society comes into contact with everything beyond it. These expressions, although still conceptual and cultural, designate permanently incomplete concepts that can never be fully closed or elaborated with perfect detail. They remain open to contingency and introduce differences into the stable rhythms of economic life. The ‘environment’ is one such borderline concept.

In more philosophical terms, the environment confronts us as *negation without an agent*: as that which interrupts cycles, breaks customs, and falsifies models, but without being intentional or directed. Such interruptions may prompt reflection and inaugurate change and innovation. Although the undirected negativity of the environment is most evident in large events, such as earthquakes and volcanic eruptions, it is important to bear in mind that the environment is never simply ‘outside’ of a society and its economic life. Instead, we could say that it ‘fills’ the space between concepts, actions, and outcomes – in other words, the environment and its negativity are intimately present in daily life. If there were none of this negativity

within and without a society with its economic life, then models would be perfect representations of reality, and the same action would always produce the same result. Of course, this is not the case, and it is in large part because of the contingency of the world and its natural environment that economic life, both individual and social, can produce the most unexpected results.

4 Knowledge Economy

To stay in touch with the environment, anticipate its contingencies, and navigate the uncertainty it generates, societies develop practices and networks for accumulating information, organizing it into structures, and putting these structures into use. In short, we can say that every society has a *knowledge economy*. Sometimes, scholars working on knowledge economies define them as the key structure of a social system's ability to reproduce itself, solve its problems, and achieve its aims. Although this is not incorrect, the excessive focus on the self-reflexive dimension of knowledge economies is a remnant of the cultural silo-thinking associated with the concept of economic life. If knowledge only ever referred to communities and their cultural devices, we would live in a worldless society without an environment – that is, in a highly predictable context with only minimal changes.

The event of the Anthropocene challenges this closed, self-referential understanding of social and economic life. In fact, a society does not need knowledge to reproduce itself – all it requires is custom and law to regulate economic activity. Instead, knowledge necessarily implies an other and an outside, that is, an environment that is negative in relation to society and its material base. Being constructed as that which mediates between a society with its economic base and the negativity of the environment, *knowledge as such includes negation* and grants the ability to say, 'This is not so'. For any transformation of our economic life and economic activity in order to face the potential anthropogenic ecological disaster, the negation of existing social and economic inertia offered by knowledge economies is indispensable.

5 Epistemic Venice

The world and its natural environment are never accessible in their entirety. The same is true for the material base, society, and knowledge. We can only grasp these abstractions more concretely when they are localized in specific places. It is always in a place where the contingent environment collides with the established structures of society. However, places are rarely only material and inhabited by physical things – they are also epistemic and full of facts, narratives, and data. Consider Venice, which is both a location and a place. As a location, Venice has specific geographic boundaries and characteristics, such as its lagoon. On the other hand, as an *epistemic place*, Venice involves multiple knowledge economies conditioned by variations in economic life. For example, in the seventeenth century, local fishermen and water officials coincided in striving to preserve the common material base of the lagoon. The fishermen's extensive knowledge of this base was recognized by the authorities, which conducted regular surveys of the fishermen regarding the state of the lagoon, in particular after a recent river diversion meant to reduce concerns about rising water levels. Nonetheless, from the epistemic perspective of the local fishermen, Venice was inseparable from the flowing rivers and the abundant fish they provided, but for the local authorities also concerned with the city, water flows were a resource (and a risk) to be managed. Unsurprisingly, in their evaluations of the effects of the river diversion, the two groups disagreed and invoked alternative explanations: for the fishermen, the course of nature was set by God, while for the water officials, it was a byproduct of a long history of artificial interventions. Although the lagoon was a common material base for the shared economic activity of both groups, the fishermen and the water officers, conditioned

by differences in their economic lives, employed distinct knowledge economies to make sense of 'Venice'. The cases discussed in the other lessons of this course will provide many more examples of how multiple knowledge economies, interconnected with particular economic lives and relations to the world, coexist within the epistemic place of Venice.

Over the centuries, Venice has been, among other things, a maritime empire, a publishing capital, a manufacturing and exporting region, a global tourist destination, and a city threatened by the effects of the Anthropocene. As a result, Venice has acquired an epistemic density that facilitates the exploration of the connections between economic activity, economic life, and knowledge economies. This exploration can shed light on the aforementioned contradiction between the reproduction of the economic base and the potential anthropogenic ecological disaster. Therefore, Venice is an epistemic resource that can be leveraged beyond its physical location, in any 'place' where established social and economic structures are being unsettled by an environment that refuses to be a subservient partner in the reproduction of the material base of humankind.

Acknowledgment

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08

Views of the Water City

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Notes

This essay is an exploration of visual representations and interpretations of Venice and its lagoon from the sixteenth century to the present. It is a journey that spans the disciplinary perspectives of art history, material culture, and media studies, demonstrating the rich interplay between these fields in our understanding of Venice's visual history.

Strolling through the lagoon's maze of *calli*, *fondamente*, and *campi*, among the piles of kitschy postcards that hide souvenir shop entrances, the *View of Venice* can still be seen. An iconic representation of the Serenissima during the Renaissance, this urban portrait by the Venetian painter and printmaker Jacopo de' Barbari, commissioned by the German merchant Anton Kolb between ca. 1497 and 1500, shows the water city in its entirety from an imaginative aerial vantage point. Today, more than five hundred years after its first publication, this image is reproduced in a variety of formats: as a postcard to be sold in souvenir shops, as a medium-sized print found in antiquarian bookstores, and a wall map in the lobbies of hotels, museums, and institutional offices. This last celebratory format better reflects the original monumental character of the print, which was made from six pearwood blocks, known as matrices, measuring 140 × 287 cm altogether – an enormous size for the printing techniques of the time. The matrices are now on display at the Correr Museum in Venice.

Since many European and North American collections own early copies of the woodcut *View of Venice*, which helped transform the Renaissance image into a popular motif in the digital age, scholars continue to investigate the aesthetic reasons for its popularity. De' Barbari and Kolb aimed to glorify the Venetian State as Europe's leading commercial and maritime power, but the drawing's composition did not exclusively employ the symbolic vocabulary of an ideal city. Rather, it is a remarkably detailed record of a naturalistic cityscape that functions as a precise topographical document, helpful in tracing how Venice's *forma urbis*, or urban environment, changed over time. Nowadays, art pieces such as the Renaissance *View of Venice* – as well as many architectural views created by Venice's *vedutisti* (city-view painters such as Canaletto, Bellotto, etc.) in the eighteenth century – are used as historical sources by scientists and environmental historians to determine the sea level rise. While the *vedutisti* painted partial scenes of urban life, de' Barbari offers a general overview of Venice, showing its entire urban fabric and, therefore, creating “the only visual testimony of sixteenth-century Venice in its entirety”,¹ as the curators of the Museum Correr point out. To represent Venice as a homogeneous whole, the printmaker probably used ground surveys and tower-based observations before positioning a virtual vantage point ca. 500 m above the island of San Clemente, modifying the codes of linear perspective to make the entire urban structure visible. At the same time, he promoted the image of Venice as an island, an idealized self-contained republic. The flatness of the lagoon's natural environment, which was excluded from the view, also determined such a distant vantage point, which was much higher compared to contemporary views of other Italian cities. For these reasons, although De' Barbari and Kolb's *View of Venice* was simply titled VENETIE MD, it is considered one of the first examples of a bird's-eye view. In Western art, this is the representation of an

¹ <https://correr.visitmuve.it/en/il-museo/layout-and-collections/venetian-culture/>.

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urban scene seen from above, from an oblique perspective: an artistic genre that became particularly popular in the nineteenth century, when cities were represented through a 'vista a volo d'uccello', 'veau à vol d'oiseau', 'vista de pajaró', 'Vogelschau', - indeed, a bird's-eye view.

The revolutionary scientific and artistic virtuosity of VENETIE MD makes this bird's-eye view a benchmark for all the subsequent cartographic projects of the Venetian Lagoon. Even in the 1980s, when the City Planning Department commissioned a new photomap of the Venetian urban space, this new cartographic system was publicly referred to as "Jacopo de' Barbari's technological heir". Known as *Fotopiano*, the descendant of the Renaissance bird's-eye view was actually a colour photomosaic of 1,129 vertical shots taken by an airplane of the Parma Aerial Surveying Company, which created a map of the historic settlements at a scale of 1:500. Aerophotogrammetric techniques provided detailed, accurate, and measurable information about a specific location, thus functioning as an instrument for the city government. In other words, according to its promoters, the *Fotopiano* was able to combine the rigour of science with the beauty of form, producing an 'operational image' of Venice's modern *forma urbis*.

A term coined by the filmmaker, artist, and writer Harun Farocki, operational images are "pictures that are part of an operation" and aim to monitor, detect, and control rather than represent, depict, and entertain. Media theorist Jussi Parikka extends Farocki's theorization of operational images beyond military and managerial contexts by reflecting on the production of scientific knowledge, including climate models, weather reports, planetary-scale computational systems, and their complex political and aesthetic implications. Within the proposed Anthropocene epoch, the bird's-eye view has shifted from an elevated, oblique perspective of urban scenes to a vertical gaze that produces detailed aerial and satellite images taken perpendicular to the Earth's surface and valued for their measurability. In this context, images from outer space have become 'enviromedia', essential for reading the scale on which climate change is occurring, as well as valuable tools for communicating the environmental crisis to the public.

However, the peculiarity of aerial photography and satellite imagery has been realized in the military context of two World Wars and the Cold War, which have also implicated 'the view from above' in the idea of a cold, detached, and hunting gaze. Post-colonial and ecofeminist studies have criticized the use of NASA's Apollo photographs (whole-Earth images such as *Blue Marble*, 1972) to symbolize the emergence of the 'global environment', the concept of Gaia, and the Anthropocene, claiming that the cyberoptimism about the Blue Planet still conceals the imperialist ideology of the space race. Donna Haraway has shown that extraterrestrial photographs imply a sort of 'God trick': the illusion of the disembodied, totalizing, and static gaze of technoscience. On the one hand, the constant monitoring of the Earth from space serves to scientifically understand and mitigate the effects of climate change and anthropic transformations. On the other hand, the cosmic vista has been criticized for publicly conveying a disembodied perspective that sublimates technology without investigating the responsibility for environmental degradation - and thus hides human and animal suffering.

Remote sensing, especially satellite imaging, is also increasingly employed to monitor what is now considered a fragile ecosystem, the Venetian Lagoon. One of the first scientific books on *Remote Sensing of Environment*, written by the geologist Joseph Lintz and the geographer David S. Simonett in 1976, reported:

Venice is being virtually destroyed [for the effects of huge industrial complexes]. The causes of this process can be observed and measured by remote sensing systems. Without such measurements it will not be possible to regulate, plan, or design methods to prevent such tragedies from occurring.

Venice has recently become an official site for the Crew Earth Observations (CEO) team, which carries out human-operated remote sensing from the International Space Station. The circulation of images of the lagoon from above on many digital platforms has contributed to transforming the public image of the Venetian Lagoon into a paradigmatic environment whose delicate equilibrium must be preserved from the effects of the global ecological crisis. Moreover, unlike de' Barbari's *View*, satellite images position the city of Venice within its broader ecosystem. When the 'stones of Venice' - namely, the city's architectural masterpieces, to use the title of John Ruskin's book title - are scaled down, what emerges is the lagoonscape.

A direct bird's-eye view of this lagoonscape can be experienced today thanks to the opening of the Marco Polo airport, built on the Tessera salt marshes in 1961. Although air travel, along with the cruise industry, has become a symbol of destructive mass tourism and a sector that should be decarbonized, flying to Venice has given many visitors the opportunity to admire the water city from above and to visually position the historic city centre in relation to its natural and industrial surroundings. Before gliding on former marshland like a seagull - a metaphor often used to promote the construction of the airport - the plane approaches the island city, passing by the huge industrial plants in Marghera, on the mainland. From above, the sinuosity of the natural little channels (*ghebi*) that divides the brackish marshes (*barene*), the most peculiar amphibious environments of the Venetian Lagoon, contrasts with the straight linearity of human intervention on the territory. According to the philosopher Rosario Assunto, who has written extensively on landscape aesthetics, the unity between the city and the waterscape - "as if it were the water itself in the lagoon landscape metamorphosing into the buildings" (Assunto 1973, 48; author's transl.) - was irreparably lost when the megalopolis of Mestre-Marghera began to grow exponentially on the mainland in the 1960s. Eighteenth-century visitors described Venice as a city that spontaneously emerged from the water "almost by evaporation and condensation" (49; author's transl.) in a visual connection with the green mainland. Today, however, an absolute visual discontinuity can be observed from above, even though Mestre, Marghera, and the historic islands are part of the same municipality (*comune*), which includes most of the Venetians living on the mainland.

Analysing the waterscape from an aerial perspective can raise new research questions. On the morning of 13 October 2023, Marco Polo Airport was closed due to a massive flock of seagulls that put flight maneuvers at risk of bird strikes. This incident reminds us that human air routes meet and sometimes collide with birds' flyways. For safety reasons, aviation today tries to be as bird-free as possible, but the ability of birds to fly has inspired humans for centuries. The natural salt marshes surrounding the airport along the lagoon are critical to the ecosystem. They buffer tidal currents and support fish habitats and a vast bird population. Therefore, near the airport, birdwatchers can easily observe herons, cormorants, shelducks, marsh harriers, sandpipers, greenshanks, plovers, and terns.

Visual sources trace the presence of the avifauna in the lagoon - Vittore Carpaccio's *Hunting on the Lagoon* being one of the earliest examples, circa 1495. The utilitarian (mainly food) value of the avifauna was the subject of visual representations until the first half of the twentieth century. On the contrary, from the 1970s onward, observing and photographing the birds of the lagoon for their aesthetic qualities became increasingly popular and developed a new awareness of environmental conservation. One of the most extensive wetlands in Europe, and one of the most important in Italy, the Venetian Lagoon is a protected habitat and is listed as a 'priority site for conservation' in the European Union's Habitats Directive. A part of the Venetian Lagoon has also been declared a wildlife sanctuary by the Ramsar Convention on Wetlands and is protected by the EU Birds Directive because it is a crucial site for numerous species of coastal wintering, migratory, and breeding waterbirds.

Given that the contemporary bird's-eye view has become increasingly distant, reaching into outer space through sophisticated recording technology, one might

ask: Where is the bird in the bird's-eye view? The challenge for the future views of the Venetian Lagoon is to take into account the more-than-human others. The hydrodynamics and geomorphologic transformations of the lagoon, as well as the more-than-human world, can be explored by using multi-species methods and positioning birds as subjects capable of taking us from the atmosphere to the hydro-sphere and vice versa. Trying to understand these animals can lead us into inaccessible spaces of wetlands, showing the power relations in the management of these environments, new levels of toxicity, as well as measures to reduce the detrimental effects of human actions on the ecosystem. Ultimately, the lagoon's waters always reflect the sky... and the sky is also the space of waterbirds (hunted, invasive, or protected).

Through various visual depictions of Venice and its lagoon created over the centuries, this essay has described contrasting human interpretations of the water city: a glorious maritime power in the past and a fragile ecosystem today. By analysing the different ideas embedded in the Venetian natural-cultural landscapes, this text has also shown that images are not only symbolic, but can also serve as support for operational activities (urban planning, environmental monitoring, engineering projects, security applications, etc.). In particular, views of Venice from above, also called bird's-eye views, have often been used to graphically and photographically represent and manage the lagoon environment, which, due to its morphological flatness, could only be grasped in its entirety from an elevated position. In the Anthropocene, the bird's-eye view has reached outer space, producing detailed satellite images valued for their scientific measurability, but also criticized for providing a disembodied perspective that fails to investigate environmental injustice. This essay concludes by proposing a new ecological reading of the Venetian Lagoon that takes into account more-than-human geographies, starting from the many species of real birds that have often been overlooked in the human interpretation of the bird's-eye view offered so far.

Acknowledgment

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Unit 2 – Glossary

Notes

Earth System Science (ESS)	Developed in the 1980s by a NASA committee called the Earth System Science Committee, Earth System Science is a discipline that embraces chemistry, physics, biology, mathematics, and applied science, transcending disciplinary boundaries to investigate the Earth as an integrated system and seeking a deeper understanding of the physical, chemical, biological, and human interactions that determine the Earth's past, present, and future states. Earth System Science provides a physical basis for understanding the world in which we live and on which humanity seeks to achieve sustainability.
Anthropocene	In 2000, the Nobel Prize-winning geochemist Paul Crutzen proposed that the planet had entered the Anthropocene, a new geological epoch in which humans have become the primary driver of global environmental change. The Anthropocene extends the primacy of anthropogenic change from the climate system to almost every other planetary process: the cycling of life-sustaining nutrients; the adaptation, distribution and extinction of species; the chemistry of the oceans; the erosion of mountains; the flow of freshwater; and so on. Therefore, the term Anthropocene now stands for an illustration of how the human footprint has extended to the whole planet, reshaping its processes. Although it is now an interdisciplinary concept, the Anthropocene emerged from Earth System Science (ESS) after the International Geosphere-Biosphere Program (IGBP) was established (beginning in 1986) to coordinate global environmental change research.
Tipping points	Tipping points are defined as critical points in environmental systems that trigger rapid, significant and irreversible environmental changes that also affect the global climate system. They are real 'thresholds' for the various environmental systems which, if crossed, can lead to major and irreversible changes in the systems themselves, but also to an acceleration of natural greenhouse gas emissions with repercussions on the state of the Earth's climate system. For example, deforestation and climate change are threatening the biological balance of the Amazon, the world's largest rainforest. Another example is the thawing of permafrost, which releases large amounts of carbon dioxide and methane, a greenhouse gas about 30 times more potent than CO ₂ in causing global warming.
Planetary boundaries	The planetary boundaries are the safe limits of human pressure on the nine critical processes that together maintain a stable and resilient Earth. The boundaries are: climate change, novel entities, stratospheric ozone depletion, atmospheric aerosol loading, ocean acidification, alteration of biogeochemical fluxes, freshwater change, land system change, biosphere integrity. These nine planetary boundaries were first proposed in 2009 by Johan Rockström and a group of 28 internationally renowned scientists. Crossing the boundaries increases the risk of large-scale, abrupt or irreversible environmental change. Moreover, planetary boundaries are interdependent, meaning that if we cross one boundary, we will affect others, or even cause them to cross out of the safe operating space. In 2023, a group of scientists quantified all the boundaries for the first time, but also concluded that six of the nine boundaries had been crossed.
Material base	To persevere over time, human beings and their societies must satisfy various material conditions, such as the possession of food and shelter. However, even in the most basic subsistence economies, these material conditions are complex and require people to engage in a broad range of production and reproduction activities, such as gathering resources, creating tools, and organising work. These activities are never merely 'economic' – they are embedded in social and cultural practices established over historical periods of varying length. In addition, while being economic, social, and cultural, the economic activities involved in the reproduction of the material base are strongly constrained by the natural environment. In short, the conditions for human perseverance and the means of satisfying these conditions constitute the material base of society.

Economic activity	To satisfy the conditions of the material base, human beings engage in many different economic activities, from gathering resources and producing tools to exchanging goods and organising transportation. Human work is fundamental to all of these activities, which means that economic activity is thoroughly embedded in broader human societies with their cultures and histories; that is, with their economic life.
Economic life	Human work is a key element in the reproduction of the material base, which means that the material base also involves the reproduction of society and specifically of the people who compose it. Such reproduction is never merely a matter of procreation and birth rates. Instead, societal reproduction is a cultural process that involves customs, habits, and relations established over different historical periods. Finally, economic life – as well as the economic activity that it encompasses – is constrained and unsettled by the environment in which it finds itself.
Knowledge economy	The perseverance of human beings and their societies is an exceptionally complex process that involves vast amounts of agents, systems, and histories. All of these distinct elements must somehow be held together and connected in order to function – the knowledge economy is the epistemic network that links together the diverse elements involved in the material base. At the same time, there is never just one knowledge economy: different groups within society may have their own knowledge economies, and there is a constant contest over which particular knowledge economy achieves a degree of generality.
<i>Forma urbis</i>	Literally ‘the shape of the city’, it represents the graphic abstraction of the building conformation of the city. It is an essential tool for cadastral purposes, city planning, and understanding architectural transformation of the city. A famous example is the <i>Forma Urbis Romae</i> , a massive marble map of ancient Rome (of which only fragments remain) commissioned under Emperor Septimius Severus between 203 and 211 AD, decorating a wall of the Temple of Peace.
Operational image	An image that does not represent an object, but is part of an operation. The term was coined around 2000 by the filmmaker Harun Farocki to define the expanding field of digital machine vision. Operational images (or operative images) are tools that perform tasks and functions as part of an operation. Instead of entertaining, they track, navigate, activate, oversee, control, visualize, detect, identify, and forecast. Although the term initially emerged from a military-industrial context, nowadays, this type of image is used in a wide variety of applications, such as medical imaging, CCTVs, geographic information systems, etc. (see Parikka 2023, in ch. 8).
Environing media	A concept developed by Adam Wickberg and Johan Gärdebo (2023) to show the role played by various media processes – like the storage, process, and transmission of data – in shaping the human-Earth relationship. Describing the interplay of ideas, technologies and physical transformations, the authors analyse how media technologies (e.g., ocean monitoring robots, climate modelling diagrams, remote sensing, satellites, and artificial intelligence) contribute to the formation of environments, understood both as physical spaces and epistemological constructs about them.
Bird’s-eye view	A view from a high vantage point that allows one to see a large area. In art history, the representation of an urban scene seen from above through an oblique perspective. Even though the first depictions can be traced back to the Renaissance, this artistic genre became particularly popular in the nineteenth century. Chapter 7 reflects on the literary meaning of the expression ‘bird’s-eye view’, exploring the Venetian Lagoon avifauna to reflect on less-anthropocentric perspectives.

Unit 3

Water Cities



09

Inland Aquatic Heritage and Venice's Hydrophilia: Meandering Along Sentimental Waterways

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Notes

This lesson is dedicated to the long-lasting and effectual domestication of the hydrosphere in the Venice lagoon. A great attention will be paid to the historical processes that have allowed the formation of the Venetian urban materiality. Within the theoretical approach of 'hydrophilia', water mobility is among the most effectual agencies that allow the understanding of the peculiar social-cultural water heritage in Veneto plain.

Urban wetlands show us a pivotal environmental eloquence. This peculiar narrative is reinforced by multiple and deep symbolic layers, strongly grounded in the humans' very inborn sense of belonging to the water realm. When considering the case of the Venice lagoon, it is worth connecting the long-lasting and effectual domestication of the hydrosphere to what is now commonly recognized as 'hydrophilic turn'. Looking at the historical processes allowing the triumph of the astonishing Venetian urban materiality, it is possible to detect fruitful relationships between the surrounding lagoonscape and the social groups living in. This symbiotic coexistence with the amphibious mosaic of wetlands and lagoons was fuelled by an 'utilitarian hydrophilia', that is widely recorded by a huge amount of documents, maps and literary texts throughout the centuries.

After this long-term historical evolution, present human-water interaction in Venice lagoon is strongly affected by human-related impacts (petrochemical plants, water pollution, floods, over-tourism). Because of these growing concerns, a shared environmental awareness has been developing, besides fostering new social attitudes. This is the context of the 'hydrophilic' approach, where the reinforcement of water appreciation is the conscious reaction as a result of the increasing frustration due to the overarching decay of both local and global waterscapes. Reimagining lagoon waterscapes as affective, life-enhancing and health-enabling geographies is the proper core of a meditative strategy allowing the recovery of a wide range of water related material agencies.

Within such non-human scenarios, the research strand is focusing on the multifaceted lagoon water mobility, viewing the whole Venetian wetland as an extensive network of navigable itineraries connecting the open sea to the low plain hydrography. Canals and rivers flowing into the Venice lagoon are actually linear paths of high cultural value where it is possible to identify specific and unique environmental and social-cultural heritage (Vallerani 2004). Since the beginning of Venice history, lagoon canals allowing navigation were much more than a passive morphological asset for daily activities. Their meandering courses, when natural, and straight, if artificially dug, are the most active scenes of water agencies. For centuries up to today, they establish the specificity of waterscape scenes, like a theatre set, where water mobility shows its visible role as a fundamental territorial performance. The wooden materiality of boats is the perfect interface between biosphere (trees) and hydrosphere (lagoon), that is the non-human materiality supporting the effectiveness of watery perspective.

Documented in detail by the archives and various man-made structures scattered along the banks and in the vicinity, the effective evolution of hydrography can provide additional information to support the stories of those who have long experienced the changing inland waterfronts. When researching water memories through fieldwork and with the aid of historical geography and cultural anthropology methodologies, it becomes increasingly interesting to detect the vestiges left by

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centuries of waterscape evolution. The intricate network of natural and man-made waterways flowing through the lower plains surrounding the Adriatic coastline is indeed an endless repository of water-related stories simply waiting to be re-evaluated, surveyed, and carefully catalogued in order to retrieve one of most remarkable cultural heritage within the Venetian *terraferma*. Scientific work in this context entails the analysis of environmental frameworks that have witnessed the consolidation of major river routes in addition to the unravelling of minor routes that connected scattered houses and small villages during the long process of creating agricultural landscapes in the Veneto flatland (Vallerani 2019). It involves focusing on the remains of a cultural and environmental heritage left in the shadows, neglected, nearly functionally extinct, fading from memory, almost a 'holocaust' caused by the overwhelming onset of different economies, activities, and perceptions.

This unavoidable process of obsolescence may seem a little less dramatic in other situations, as in Battaglia Terme, a tiny town on the twelfth-century Battaglia canal heading towards south Padua, where a handful of competent and enthusiastic volunteers offer their constant and worthy commitment in the local Inland Navigation museum. These volunteers have set themselves the existential objective of retrieving the cultural components tying a wide range of hydrographic elements such as rivers, lagoons, and lakes to their riparian communities. The generous efforts of the guardians of water memories (Jori 2009; Mainardi 2012) have long been supported by the activities of researchers from academia as well as of local cultural institutions. The work of these researchers has provided a rich bibliography, which expresses a stimulating cultural vibrancy, recovering significant land and river knowledge founded not only on navigation and boat building, but also on other related topics such as fisheries, ports, and the dynamics of riverside settlements.

The geographical position of Battaglia Terme, on the waterway connecting the Euganean hill to the Venice lagoon, is definitely a meaningful case study because of the deep connections with the expansion of Venice in mainland, after subduing flourishing city-States like Padua and Vicenza. The low plain between Euganean hills and the southern Venice lagoon was actually a strategic area where a complex hydrographic system had been adequately managed since the twelfth century in order to foster inland navigation connecting the thriving markets of the above mentioned Vicenza and Padua with the port of Chioggia. Clear evidence of the importance of these connections can be seen in the increasing demand for slabs of trachyte for use in the flooring of *calli* (roads), *campi* (squares) and *fondamenta* (quay sides) of Venice. For centuries, the quarries of Monselice and Lospida supplied stone, contributing to the spreading and consolidating of Venice's materiality. The consolidation of the complex waterways network in the area is the result of relevant engineering interventions affecting the lower Bacchiglione and Brenta rivers, whose natural water flows were constantly regulated to improve both commercial navigation routes and land reclamation (Vallerani 2017). At the core of such hydrographic setting, the Battaglia canal was dug at the end of twelfth century, joining Padua to Monselice, a relevant stronghold defending Paduan southern borders.

The issues discussed so far have shown the importance of Venice's inland nautical heritage. It is worth mentioning that today there is an increasing awareness of the importance of waterways, in terms of both their touristic and recreational value. As a matter of fact social attitudes are revealing an increased appreciation for fluvial environments insofar as they provide ideal settings for sports and recreation as well as opportunities for cultural tourism. Hydrographic atmospheres belong mostly to rural landscapes eschewing urban development making. As a consequence it is possible to define waterways as 'cultural corridors', that is a repository of manufactured items related to specific hydraulic functionalities, but also of Venetian villas, old churches and chapels, traditional farm houses and water mills. Many of these buildings have become landmarks for tourism along European rivers, even being transformed into thematic museums also involving the surrounding environment.

In countries such as Britain, France, Belgium, Holland, and Germany, the established practice of river tourism has stimulated the recovery of almost all the locks necessary to fluvial navigation, and encouraged new businesses to reopen old river inns, thereby facilitating friendly and lively encounters among land and river travellers.

Matters concerning fluvial tourism should be addressed by means of specific governance strategies aiming at the strict safeguarding and restoration of the natural environment, in order to satisfy the growing demand for attractive leisure spaces providing opportunities for city dwellers to relax and regenerate physically and psychologically. The prospects outlined here concerning the promotion of tourism in the area should obviously aim not only to increase the number of visitors, but, as just mentioned, should also respond to the growing demands of residents wishing to improve the quality of day-to-day living. The humanisation of living space does not only mean taking care of the physical locations, but also involves finding the means to satisfy the habitation needs of the local population, recapturing the pleasures of social relations, and therefore encouraging a more aware sense of place.

Up to the 1950s, before the general spread of engine propulsion, a wide range of wooden boats dominated the theatricality of water mobility. The fascinating variety of typologies were the tangible and mobile heritage clearly explaining the social and material relationships with lagoonscape. Despite today the serious reduction of traditional vessels is an indisputable fact, we can however realize the growing recovery of leisure boating on both rowing and sailing wooden boats. This is not a new aspect of hydro-social practice (as gorgeously witnessed in eighteenth-century landscape painters like Canaletto), but the encouraging sign of water affection involving both insiders and an increasing number of visitors.

Finally, it is of some interests to expand the analysis of not local floating mobility, especially considering the great diffusion of both fibreglass and inflatable kajaks and canoes. This new materiality gives an extraordinary opportunity to go well beyond the usual practice of transport, allowing a more aware embodiment with rivers, canals and lagoons, thanks to the navigation at the water's edge. Paddling on board of kayaks or canoes is actually one of the best opportunity to become knowledgeable of untrodden Venetian waterscapes.

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10

'Another Venice in the World' with a Different Outcome. From Tenochtitlán to the Creation of the Urban Valley of Mexico

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Notes

This lesson aims to contrast the geohydrological trajectory of Venice in the early modern period with that of another water city in the New World: the city of Mexico-Tenochtitlán. If Venice has been proposed as an Anthropocene city, the same could be said of Tenochtitlán, since both were built on artificial islands. But in the long term, the different policies of relationship between the city and its aquatic environments have produced opposite environments in both cases, for while the lagoon of Venice has been preserved, the lake of the Valley of Mexico has practically been transformed into a mega-city. This reminds us of the importance in the Anthropocene of our imaginaries of the relationship between society and the environment, and of the competing interests that can drive very different projects with contrasting outcomes for both society and the environment.

Every society has had to adapt to its particular environment, and at the same time, has altered and transformed its milieu. But there are some cases in which human intervention is more extraordinary, such as in Venice and Tenochtitlán, the Aztec capital, today Mexico City. Despite their complicated environments, respectively within a lagoon and in a high plain lake, in both cases a beautiful city was built, mainly over land reclaimed from the waters. That is, not only the city was built but even the land itself, since they were established on an archipelago of artificial islands. In this way, both are extreme instances of the interweaving of nature and culture, not only raising a city from the waters but also changing its surroundings to solve particular problems such as the scarcity of freshwater, flooding and silting. At the same time, these two cases show the impact that human decisions and projects have had on the environment, since from a similar aquatic environment they took very different historical paths, producing quite contrasting landscapes in the long term. So, although not without problems, in Venice the lagoon has been preserved, while the lakes in the Mexican watershed have almost disappeared and a huge urban region has taken their place.

We believe that comparing these two historical cases can shed some light on the environmental problems caused by humans, whose impact has reached such magnitude that, so far this century, the idea of a new geological epoch has been discussed: the Anthropocene. But if we want to understand how humans have become a geomorphic force, we must go beyond its effects, such as traces on geological strata, to recover its social causes in a *longue durée* history.

Although nowadays the anthropic impact on the environment has reached a global dimension, we must not disregard that it is not a homogeneous process, but it acquires diverse and even contrasting dynamics, intensities and temporalities in different places. In this way, historical and comparative studies have become very useful to understand the Anthropocene with its complexity and differentiated local impacts. Thus, we must take into consideration the different roles that these two aquatic cities have played within the formation of the modern world, starting from the process of early globalization and imperialism, and how this has impacted their relations with their aquatic environments.

Despite their differences and geographical distance, the likeness between these two water cities did not go unnoticed since the first reports about the capital of the Aztec empire. Their resemblance can be seen already in the first representation of Tenochtitlán, the so-called Map of Cortés of 1524. The news that the main city of the New World was also on an island, was a very suggestive image for the

CLASS TIME:
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Venetian milieu. This was expressed in diverse forms, for instance, Alessandro Zorzi relied on the Map of Cortés and on the famous bird's-eye view of Venice by Jacopo de Barbari to offer a similar and beautiful perspective of Tenochtitlán and its surroundings. Likewise, these crossroads were also developed in the contemporary *isolario* genre, that is, in early modern books on islands. Since the *Book of Benedetto Bordone* in 1528, and posterior texts on islands, Venice and Tenochtitlán occupied a privileged place as the main cities located in islands. The similitude between both water cities was also explicitly highlighted in these books. For example, in 1577, Tommaso Porcacchi wrote about Tenochtitlán that “not without wonder we see another Venice in the world”.¹

Venetian authors compared and equated their own city not with the contemporary capital of New Spain, but with the previous indigenous city and its water environment. Despite the initial similarities, these representations were anachronistic precisely because the same incipient process of globalization, that allowed their mutual knowledge and comparison, had different impacts in both cities and their surroundings. The defeat of Tenochtitlán by the Spaniards and their allies provoked important changes. Not only because the city had largely been destroyed and rebuilt. But in a deeper way, in what the historian of the *Annales*, Fernand Braudel, called the structures of everyday life, with the introduction of new species and techniques that altered the traditional forms of production and consumption.

After the defeat of the Aztecs, the Spanish people introduced plowing and cattle, and increased deforestation in the basin of Mexico, which caused soil erosion that allowed the reclamation of the shallowest parts of the lagoon already in the sixteenth century. At that time, Venice was also facing silting problems, to avoid this, throughout early modernity, the courses of some rivers were diverted out of the lagoon. In the basin of Mexico, the diversion of rivers has also been practiced pre-Hispanic times but to avoid flooding, and was implemented again under Spanish rule. And this would not be the only indigenous idea to be recovered.

In 1555, the Spaniards suffered their first major flood in Mexico City. In search of a solution, the viceroy consulted different sectors of society. Two main ideas were presented. On one hand, indigenous people proposed to rebuild the old pre-Hispanic dike to protect the city, at the same time that the lake life continued as usual. We can have an idea of such a project through a contemporary indigenous map in which traditional water works and lake life are highlighted.² On the other hand, Spanish settlers introduced a completely different idea: to open an exit to the waters of the lakes. On that occasion, the viceregal government supported the reconstruction of the old dike, which was built and directed by indigenous people. Due to the Spanish city council refused to pay for the works, an inquiry was opened in which friars and indigenous rulers defended the importance of lagoon life and the need to preserve their waters. Thence, although the controversy between urban and lake visions and interests was already present, at first, both the importance of aquatic life and the local knowledge and experience on water management were recognized.

Yet things changed in Mexico in the seventeenth century. The indigenous population, and therefore its influence, declined, while Spanish urban settlers became stronger, as did the idea that the lake environment could be transformed to suit their vision and interests. Then, the project of opening an outlet to the waters of the lakes was revived and proposed as the only solution to keep the capital free of floods. From then onwards, it was seen only as an engineering problem in which indigenous knowledge, lake life and even local geography were disregarded since

¹ “Non senza maraviglia vediamo un'altra Venitia nel mondo”. Tommaso Porcacchi (1576). *L'isole piu famose del mondo*. Venezia: Simon Galignani & Girolamo Porro, 157.

² Mainly the Map of Mexico which was erroneously attributed to the cosmographer Alonso de Santa Cruz and is kept in the Library of the University of Uppsala.

the idea was to turn the closed basin into an open valley. The project was designed and directed by Europeans while indigenous people were used only as labour in a project of no use for them, but only for urban interests. The works of drainage began in 1607 and extended for more than 13 kilometres in length, six of which was a tunnel. Despite its dimensions, through the labour of 60,000 indigenous people, in ten months an outlet to the lake waters was created. Anyway, its capacity was very limited, so, the water cycle continued working as a basin, the lakes remained, and the city continued to suffer sporadic flooding.³

Later, in 1637, in search of a permanent solution, it was proposed to increase its capacity by transforming the drainage tunnel into an open trench, but this was a massive and complicated work that would take more than a century and a half to accomplish since it was only finished in late eighteenth century. Geographical transformation, like the conversion of a basin into a valley, was a huge task closer to a geological process. Although generally seen as a problem for the city, this was welcomed by the surrounding areas, where the rich life of the lake was able to continue for a long time.

The confrontation between different ways of life, interests and visions about the ideal and convenient environment did not diminish after the independence from Spain. Quite the contrary, imperialistic dynamics even increased in what have been called 'internal colonialism'. Since the middle of the nineteenth century, scientific and enlightened ideas were used to justify an ideal of progress and modernization, in which the urban lifestyle was central. This caused the common good to be interpreted in the Valley of Mexico as urban interests and not as life linked to the lake environment. In this way, this hegemonic discourse gave new impetus to the drying of the lakes to protect and promote urban wealth and growing real estate businesses.

Although some more holistic projects were proposed to use the water for irrigation and navigation, in the end, the hydrophobia behind the ideal of progress and urbanization succeeded, so the works focused only on the drainage task. By the turn of the century, not without its problems, the so-called Grand Canal was built, which carried out sewage as well as rain waters. So, it was at that time when the lakes began to shrink noticeably, while the city expanded throughout the landscape once occupied by the waters. At the same time, freshwater had to be brought to the growing population, so it was taken from the south of the valley but also from the subsoil, which caused subsidence of the city, which in the long term decreased the slope and capacity of the Grand Canal. As an alternative to this problem, in the second part of the twentieth century, a new solution for the old flooding problem was developed: a deep and huge drainage system. At the same time, the city continued to expand along with the necessity of fresh water which was satisfied by bringing it in from neighbouring basins.

Today the metropolitan area of Mexico City has imposed itself not only on its own watershed but also on other adjacent ones, thereby some authors have begun to talk about a huge hydro-politan region created artificially by connecting four different basins. This system not only produces tensions with the regions from which the water is taken, but is not sustainable in the long term, since once the water has been taken and used in the megalopolis it is expelled along with rainwater without no serious attempt to treat and reuse it. Despite its dimensions, the lack of efficiency of the hydraulic system also produced tensions also within the city, mainly in the peripheral and poorest neighbourhoods which are the first to suffer the shortage of water and the floods when the capacity of the system is exceeded.

Today, overexploitation and droughts have caused the system that brings water from other basins to Mexico City to lower its levels alarmingly, along with those of

³ Among the different projects, the one elaborated by Heinrich Martin or Enrico Martinez was selected. Martínez was also in charge of directing the works.

the underground water with which the megalopolis quenches its thirst. As in other areas, nowadays in the Valley of Mexico warning voices have already been raised about the upcoming water shortage, which will become inevitable if the same hydraulic policy developed by the city for four centuries of using and evicting the waters from the watershed continues.

Despite the quite different results, in the end, the projected plans to deal with local hydro-geology succeeded in both Venice and in the Valley of Mexico. But the views on the landscape that have prevailed over the last centuries have been practically contrary in the two cases. Thereby, while in Venice the water party triumphed in preserving the lagoon over those who wanted to reclaimed land from the waters, in the Basin of Mexico the result were completely the opposite, the urban and real estate interests prevailed over those of the lakes and, still today, over the surroundings, including some others basins. This shows us an important lesson for the environmental challenges we currently face. There are no unavoidable outcomes, but rather the paths of anthropogenic landscape changes are the product of human decisions within social tensions and controversies.

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11

Cross-Cultural Reflections on Siamese Water Cities as 'Venice of the East'

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Notes

This lesson looks at the historical and cultural genealogy of the comparison between Venice and the Thai capital Bangkok from the perspective of studies in cultural anthropology. Drawing on the neglected heritage of the 'canal-temple system' that characterizes Bangkok's religious, urban and hydrogeological layout, the argument focuses on the historical connection between the ecological, infrastructural and socio-cultural fabric of the two sinking cities, Venice and Bangkok, and their response to common challenges such as rising sea levels, climate change and unsustainable human development.

1 Introduction

Parallels between Venice and other places, in Asia and beyond, are common. These comparisons evoke the paradigmatic position of Venice in a globalized cultural imaginary of waterscapes and water cities. In this lesson, I look at the historical and cultural genealogy of this comparison and at its current possible implications seen from the perspective of studies in cultural anthropology. Drawing on the neglected heritage of the 'canal-temple system' that characterizes Bangkok's religious, urban and hydrogeological layout, I focus on the historical connection between the ecological, infrastructural and socio-cultural fabric of the two sinking cities, Venice and Bangkok, and their response to common challenges such as rising sea levels, climate change and unsustainable human development.

Since the Middle Ages the lagoon city of Venice has been a bridge between Western and Eastern material and intangible cultures, histories and arts. Often acknowledged by academics and scholars, and even abused by journalists and by tourist communication campaigns, the formula 'Venice of the East' is not infrequently adopted to refer to Asian cities and capitals whose urban landscape has historically been characterized by the dense presence of waterways and canals. As an index of the popularization of this formula, also Wikipedia, the online open access encyclopedia, reserves a whole page on this subject.¹

According to the sources of the page curators, drawn from academic literature and international mainstream media, at least 42 cities can be listed with the nickname *The Venice of the East*: two in Bangladesh, one in Brunei, eleven in China, one in Micronesia, one in Hong Kong, two in Indonesia, one in Iraq, eleven in Japan, three in India, two in the Philippines, five in South Korea, and two in Thailand: the old Siamese capital Ayutthaya and the new one, Bangkok.

2 The Siamese capitals as Venice of the East

Phra Nakorn Sri Ayutthaya, the old Siamese capital until its destruction by the Burmese army in 1767, and Bangkok, the new Siamese-Thai capital established by the Chakri dynasty on the delta of the lower Chao Phraya river basin, are still today often advertised as 'Venice of the East'. The nickname appears in scholarly literature, museum captions, in tourist guides and brochures, and functions as a mythomoteur for national identity, academic speculation and tourist promotion. According to the Asian Studies scholar Ying-kit Chan, who criticizes the Singapore government's populist campaign to promote Singapore as the Venice of the East, the Siamese capitals

¹ https://en.wikipedia.org/wiki/Venice_of_the_East.

in Asia actually embody an historical record in this regard that neither Singapore nor other Asian cities can claim (2013, 311). As he writes:

Bangkok (and its adjacent city of Ayutthaya) was truly Venice of the East in European writings [...]. H. Warrington Smyth (1867-1943), a British mining engineer who had served in Siam, described Bangkok as “[T]hat Venice of the East, delighting the soul with its glided palaces and gorgeous temples”. Henri Mouhot (1826-1861), a French naturalist, called Bangkok “Venice of the East, and whether bent on business or pleasure you must go by water”. Reverend N.A. MacDonal said “[Bangkok] contains about 400,000 inhabitants, and has been called the Venice of the East, from the fact that much of the city is floating on the river in the form of floating houses”. Bangkok, for its idyllic scenery and characteristic canals and waterways, was Venice of the East in the eyes of its European travelers.

Since the first European explorations, the delta has been known to Westerners, and Ayutthaya (located about 80 kilometres north of Bangkok, at the confluence of the Chao Phraya, Lopburi and Pasak rivers) was given the nickname Venice of the East by the Portuguese, the first Christian traders to establish settlements along the Siamese rivers, in the early sixteenth century. A new capital was founded by the new king, Taksin, soon after the Siamese were defeated by the Burmese in Ayutthaya, which was almost completely destroyed. Initially settled on the west bank of the river, in the old city of Thon Buri, King Taksin was overthrown by one of his army commanders, who eventually became the first king of the Chakri dynasty. After his succession, the royal court would eventually settle on the eastern bank of the river, corresponding to ‘Ban Makok (Wild Plum Village)’, later shortened to ‘Bangkok’. The new Siamese capital was officially founded on 21 April 1792. The establishment of a new capital named Khruang Thep Maha Nakhorn, the Great Capital City of the Angels, sealed the rise of the so-called Rattanakosin Era, which today has found expression in its tenth king, Vajiralongkorn, or Rama X.

For the first century after its founding, and before the massive concretization that began in the early twentieth century to modernize (that is, westernize) the royal capital, Bangkok followed the same urban model as Ayutthaya, based on waterway connectivity and on amphibious (royal, religious and vernacular) architectures. From its founding until the early twentieth century, the new capital witnessed important efforts to reengineer the natural waterways of the delta, in order to improve the defensive, infrastructural and agricultural potential of the canal network system. For instance, the main royal palaces and temples were surrounded by two main canals, the *Khlong Rob Khruang* and the *Klong Padeang Khruang Kasem*, deliberately dug to isolate and protect what would become Rattanakosin Island (*Kho Rattanakosin*), the historic centre of the city, while allowing faster communication and exchange. For centuries, life on the river and on the canals has shaped the daily life of the Siamese people, merging elite and popular water cultures, simultaneously shaping religious, political and economic landscapes, but also diplomatic and cosmopolitan relations with the West: indeed, as in Ayutthaya, the main settlements of European merchants, traders and diplomats were established along the river and canals. However, the resemblance between the waterscapes of Venice and the Siamese capital(s) is not the only historical thread linking the two contexts.

3 Cross-Cultural Connections Between Venice and Bangkok in the Twentieth Century

The modernization and westernization of the country is historically bound to the royal family’s direct experience of European countries and diplomacy. The visits of King Chulalongkorn (Rama V) to Europe in 1897 and in 1907 opened a new chapter in the cultural relations between Bangkok and Venice. Rama V was considered the great modernizer of the nation and was open to exchanges with the Western

colonial powers. During his 'grand tour' of Europe, Venice proved to be one of the most inspiring European cities for him. As Sud Chonchirdsin (2009, 443) recalls, the Siamese king was welcomed in Venice on the 15 May 1897 by the Duke of Genoa, Tommaso Alberto Vittorio, during his European Grand Tour. He appreciated Venetian architecture and arts, but was also struck by the dramatic poverty of a large part of the population. His visit to the Biennale exhibition made him fall in love with the talented art of Galileo Chini, to whom he commissioned the frescoes of the Royal Throne Hall in Bangkok and other prominent works. Chini, a native of Florence and an avant-garde artist who brought the values and aesthetics of the Austrian Secessionists (and particularly of Gustav Klimt) to Italy, spent two years in Bangkok (1911-13), and portrayed the capital, its people and atmosphere, its palaces, canals and temples in several artworks. Furthermore, after his sojourn, he returned to the International Art Exhibition of Venice in 1914 to exhibit some of the results of his artistic experience in the Venice of the East (De Grassi 2019, 79-95). Even today, the Historical Archive of the Biennale (in Marghera) preserves some of his paintings related to the artist's years in Bangkok.

Rama V's return to Bangkok from Europe was also an opportunity for him to incorporate his new knowledge of Italian landscape and art into the urban fabric of the royal capital. The appreciation of Italian sculpture and architecture by Chulalongkorn and by his successor, King Vajiravudh (Rama VI), meant major investments in this sector. The kings commissioned Italian architects and engineers to design and build prominent royal, civil and religious buildings. While Carlo Feroci was commissioned with the construction of the Throne Hall, the design and construction of the Norasingh Palace, the Government House of the Thai capital, by Annibale Rigotti in 1926 in resemblance to the Venetian Gothic architecture of the Ca' d'Oro, is perhaps the most significant trace of an emerging cosmopolitan imaginary, a powerful transcultural heritage where the royal capital sought to actively incorporate Venetian aesthetics and semantics. This is not only evident in Chini and Feroci's work with royal architecture and decorations. Also the water landscape, for some years, carried the traces of the tribute paid by the king to the unique atmosphere of Venice. This is the case of the (no longer existing) old version of the Saphan Han, a bridge lying on the southern course of the Khlong rob khruang, in the ChinaTown area, as noted in a recent article in the national newspaper *The Bangkok Post* celebrating the Royal family's photographic collection. At that time, the same could be said about the Saphan Han.

Saphan Han (literally, 'turn bridge') was originally built during the reign of King Phutthayotfa Chulalok (1782-1809), and indeed a section of it would rotate to allow oversized vessels to pass unimpeded. The bridge subsequently underwent several reincarnations. Most notably, at King Chulalongkorn's behest, Saphan Han was newly designed to incorporate features from two iconic bridges in Italy: the bowed expanse of the Rialto Bridge in Venice and shops lining the Ponte Vecchio in Florence.²

Today, Saphan Han has been completely transformed. While infrastructural modernization and industrial development in Venice have been confined to the *terraferma*, the mainland districts of Mestre and Marghera, the poor, vernacular architecture and waterfront market centres along the Khlong Rob Khruang and other ancient water arteries have been erased by gentrification projects that have covered, cleaned up and reshaped the human and infrastructural appearance of this and other ancient corners of the old city, where the concretization and development of the urban space often correspond to the eradication of the amphibious vernacular economies, architectures, cults and daily habits of poor inhabitant (Jumsai 1988).

² <https://www.bangkokpost.com/life/arts-and-entertainment/2736460/black-and-white-reminiscences>.

4 Sinking Cities and the Challenges of the Anthropocene

It is impossible to imagine Venice without its residents: the voices, sounds and smells that emanate from the daily life and work of the local people, in the city and along the canals. While in summer the city centre is overwhelmed by tourists, in autumn, winter and early spring the lagoon sometimes regains a magic coat of thick fog and thin rain, and only the colourful Venetian dialect can be heard along the canals. The city suffers from the dramatic reduction of its original population, rapidly replaced by foreigners with long and short term ambitions and projects that also make Venice a hyper modern cosmopolitan venue and cultural hub. The real estate market and the overexploitation of the city for the sake of tourism have changed the demographic pattern of Venice. The city is sinking due to rising sea levels, underground water pumping and soil compaction. Similar problems are also causing the submersion of Bangkok.

While a policy of resilience has been developed for Venice, the Thai capital's administrators seem reluctant to take this step. Scholars investigating subsidence and related problems in and around the Bangkok metropolitan area and along the Chao Phraya river delta warn that citizen science, popular architectural and hydrogeological knowledge of canal management and local river cultures may be essential in protecting Bangkok from disastrous flooding – such as that which tragically occurred in 2011 – and subsidence. This perspective is reinforced by scholars who have noted that the presence of religious architecture along the canals once favoured the preservation of the waterways, preventing their concretization (Ahamed-Broadhurst 2017). While the hydrogeological importance of revitalizing the khlung network has been recognized by the ruling classes and the municipal technocratic apparatus for many decades, this revitalization also implies the gentrification and touristification of the khlongs, which seriously compromises the conservation of the cultural and biotic ecosystems historically generated by the presence and daily use of the waterway networks. Such processes also entail the loss and dispersal of historical urban communities, cults and customs. In Bangkok these cultural-natural ecosystems testify to the interdependence of human, non-human and supra-human complexes that contribute to the life of the river and of ancient canals as 'cultural reserves' of moral and religious practices and sentiments (Thai Buddhist, Chinese Buddhist, animist and even Catholic and Islamic), often involving water animals, water spirits, water legends, water rituals and so on. Such entanglements are usually neglected by urban planners. The amphibious cultural life of the khlongs is still very dense – even more so than in Venice – but unlike in Venice, it is locally perceived as problematic and inconvenient, and hence undervalued. Given that various ideas and projects are already emerging from civil society organizations and from the work of engaged scholars (Elinoff 2023), further research should be encouraged to make up for the lack of historical and anthropological documentation of Bangkok's waterways as more-than-human ecosystems and as water cultural heritage, following the Venetian paradigm. Also, a space for cross-cultural exchange between Bangkok and Venice should also be promoted in the future, based on the memory of past relations and the common climatic and socio-environmental challenges that lie ahead. The establishment of a Bangkok Biennale of Arts and its links with Venetian art circles,³ as well as the recent steps recently taken to seal the sisterhood between the two cities, affirmed by the Bangkok Metropolitan Administration (BMA) and the Honorary Consul of Thailand in Venice in early 2024, might represent significant progress in this direction, furthering the long-established parallel between the Italian and Siamese Venice.

³ Belcher, D. (2024). "Bangkok Takes Its Place on the Venice Stage". *The New York Times International Edition*, 20 April, 6. www.nytimes.com/2024/04/19/arts/design/venice-biennale-bangkok.html/.

In conclusion, the comparison between Venice and Bangkok suggests a reflection on the common challenges faced by two cities deeply caught up in the contradictions of their own developmental and infrastructural choices. Connected since the pre-industrial times, in the Anthropocene era they both suffer the effects of the climate crisis more than other cities and in very similar ways. The anthropological reflections presented in this lesson, then, aim not only to highlight the cultural conservation of urban waterways as a source of resilience in the face of the climate crisis. Indeed, we also wanted to convey the idea that, in times of crisis, such conservation efforts can be transcultural in nature, grounded in cultural and artistic exchanges that generate reciprocity, shared knowledge and a common understanding among future generations of the ecological urgency of preserving human and more-than-human water cultures on a global scale.

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Unit 3 – Glossary

Notes

Hydrophilia	We can define it as an ancestral perception concerning the aesthetic experience that begins with physical stimulation of the senses, the physiological mechanisms of sight, smell and hearing, and ends in moods, emotions and symbolic meanings. Such inborn appreciation obviously depends on human physiology and vital needs, so that humans, throughout history, have always tried to settle themselves close to rivers, lakes and coastlines. Without going deeply into this relevant topic, it is worth highlighting that such biological aptitude has been continuously transformed by layers of cultural evolution and symbolic dynamics to assign indisputable shared values to waterscapes, whether in rural or urban contexts.
Water mobility	Waterways are linear itineraries for navigation, whose historical evolution overlaps with the social formation of riverine communities. Therefore, rivers and canals cannot be defined as waterways without nautical practices. Inland navigation is therefore one of the most meaningful operative activities able to express millennial relationships between societies and waterscapes. Water mobility obviously depends on boats, whose immense array of typologies goes along with the extraordinary variety of waterways flowing on every continent. In most riverine environments, the historiography of past navigations is only recently filling the information gaps, both at the local and regional levels, thanks to the wide array of archival handwritten documents, with the crucial support of historical cartography, afterwards integrated with printed reports, water engineering treatises and technical journals.
Fluvial tourism	Hydrography constitutes a major tourism resource, providing spectacular settings, recreation facilities, a means of transport, a sense of heritage and adventure, and links with the environment and natural world. Rivers are also major spatial elements of the landscape and constitute a significant tourism resource. As the discussion reveals, their use is increasing as people begin to understand the amenity of river views. As to the peculiarity of the waterways network in the Veneto inland, rather than tourism in the true sense of the word, it is more correct to speak of recreation, that is, opportunities for psychophysical recovery and leisure to be practiced within the span of the day by urban users.
Valley of Mexico	Anthropogenic geography artificially generated in the area of today's Mexico City by opening an outlet for the lake waters, transforming the closed basin into an open valley, which in the long term has allowed most of the lakes to dry up and become an urban valley.
Early Anthropocene	As an alternative to the idea that proposes that the Anthropocene began in the nineteenth century, with the industrialization, or in the twentieth century with the Great Acceleration, some authors propose that it was with modern imperialism and colonization imposed for the first time by Iberian empires, that the Anthropocene began.
Geo-hydrology	Knowledge, practice and projects that deal with the geological and hydrological environment. It comprises not only the study of local geographies, but also the anthropogenic alteration of landscapes, whose impact has increased in modern times.
Common good controversy	Contrary to its naive interpretation, what is considered general welfare, as well as the public benefit that public works should seek to fulfil, is not something evident or uncontroversial, but can change according to the different points of view and perspectives of the different social groups in a community. It is, therefore, a political issue, involving controversies and tensions, which can be resolved through agreements and negotiations, but also through the imposition of a hegemonic vision over others.
Internal colonialism	Just as since modernity some nations have imposed colonies at the international level seeking to dominate native populations for their own benefit, at the local level, some social groups have developed a similar dynamic, imposing their visions and interests on other parts of the population for their particular benefit, which has continued even after independence processes.
Bangkok's canal temple/system	Following the study of the human geographer Ahamed-Broadhurst (see ch. 11), the canal/temple system can be described as a complex architectural and infrastructural sequence of Buddhist (Thai Theravada and Chinese Mahayana), Taoist and animist temples and shrines with their piers/dock's leaning on Bangkok's waterways (on the model of the ancient capital Ayutthaya).

Chao Phraya River	Literally, 'the river of the kings' is the longest river of Thailand (372 km), collecting waters from four main tributaries, it begins in Nakhorn Sawan at the confluence of two northern rivers, the Nan and the Ping, and ends in the Gulf of Siam.
Khlong (Central Thai)	Waterway, water channels, canals (natural and artificial)
Kho Rattanakosin	This refers to the old city centre of Bangkok, where the main temples and royal palaces are located. Bordered by the Chao Phraya river on the west, and by the Khlong Rob Krung, artificially merging two natural canals, on the east. Kho means 'island', while Rattanakosin is the pali name of the Jewel of Indra (founding the Hindo-Buddhist cosmology) and refers to the Siamese kingdom in the first period of reign of the Chakri Dynasty.
More-than-human world	A concept, become inescapable to contemporary ecology movements, introduced by the American philosopher David Abram in the end of the twentieth century to overcome anthropocentrism in philosophical descriptions and understanding of nature, and to widen the speculation on the relatedness among human and non human beings under perceptual, phenomenological and ethical aspects.
Mythomoteur	A word composed by the word 'myth' and the word <i>moteur</i> (engine) in order to describe the emergence of dynastic powers in the Lower Middle Ages, in sociology and political sciences the term refers to one or more myths founding the sense of national and ethnic belonging of a specific group. A mythomoteur is basically developed, transformed and conveyed to legitimize dynastic power.
Subsidence	Geological phenomenon of slow lowering, downward movement and even collapse of portions of a waterbasins or continental land due to natural causes or to human activities (like groundwater pumping, concretization, etc.).

Unit 4

Cultural Politics and Ecosocial Troubles



12

Political Epistemology of Venice's Hydrology

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Notes

This lesson highlights the political dimension of science-based transformation of the Venice waterscape. Although the history of the territory and the hydrological basin connecting the Alps to the Mediterranean Sea depended on forms of knowledge (scientific and not) and technological capacities, the history of Anthropocene Venice is not technocentric. Rather, it relates to political decision making, cultural systems, economic practices, ideals and aquatic ways of living and experiencing the territory.

The solution to problems of water management is far from a purely technical question. It does not solely depend on the capacity of hydraulic engineers to address objective and 'neutral' problems, left alone with their own means. No water expert can work in insulation from society because decisions concerning water have always been complex from a social and ecological viewpoint. Indeed, they are embedded in different visions of society and its future. Interventions aimed at regulating and controlling flows become inscribed in the territory which they alter. Most importantly, to manage water equates to manage the conditions for life. The *2024 UNESCO World Water Development Report* clearly states that peace and prosperity are dependent on wise, just and sustainable uses of water (United Nations 2024). Allocation for alimentation and hygiene, domestic activities, drinking and fishing, agriculture, transportation, and energy production need to be balanced else they generate conflicts within a community, between different groups, towns, and states. Water, with its cycle, and society, with its cycles, too, work together as concurring hydro-social forces of world transformation. The dialectics of water and society constitute a dynamic juncture from which one can aptly observe the Anthropocene condition, in which humans and their technologies have become major geological factors. Indeed, water politics can be termed a "total geological fact" at the encounter of the Earth sciences with cultural anthropology (Schmidt 2017, 20). Venice is a paradigm case of Anthropocene hydrosociology: the survival of its natural-cultural settings is linked to the evolution of the climate and the conditions for life on Earth.

This lesson looks at water from the viewpoint of political epistemology, that is, from a cross-disciplinary viewpoint that connects 1. hydraulic knowledge, 2. philosophy (especially epistemology), 3. history. Relative to history, this should not be understood as history-writing and narrativity as much as a comprehension of reality as a process, and 4. political theory.

The historical materiality of Venice witnesses to the intricacies of the natural-human coevolution, mediated by science and technology. Far from being the result of a blind causality, guided by an alienating and impersonal necessity, the genesis and development of the Lagoon of Venice has been shaped by individual and collective purposes and subsequent actions. Past decisions shaped the lagoon, its coastal lines, and the riverine system, from the Alps to the Adriatic Sea. Venice's environment looks now very much as a cultural-natural cyborg. The path dependencies that made it reach its present form reflect ways of experiencing, representing and living the territory, as well as in economic interests, and political motivations. The mercantile classes that ruled the city in the Middle Ages and the early Modernity requested the protection of its watery environment to the benefit of commerce and maritime expansion. Their engineers, as a kind of 'organic intellectuals' of the maritime mercantile class, efficaciously defended the lagoon by diverting riverine sediments outside of it. In the sixteenth century, the highly esteemed water officer Cristoforo

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Sabbadino opposed the agrarian faction of land speculators. Among them, his main opponent Alvise Cornaro encouraged vast reclamation projects that would have led to the total embankment of the lagoon. Against him, the victory of the 'water party' secured centuries of river diversions following Sabbadino's prescription, summarized in three lines of this sonnet of his:

Oh Venice! Remove the rivers and put a brake
To the greedy lusts of men. The sea
Will always obey you once its waters remain the only ones in the lagoon.

Without constant re-engineering of its waterscapes, Venice's insularity would have been lost. Today, the city would be similar to localities such as Ravenna and Caorle which used to be water cities, too. Ravenna flourished as a port city in ancient times but is now several kilometres away from the coast, as a result of sedimentation processes. As for Caorle, north of Venice, it was an island in the Renaissance but the rivers that the Venetians diverted from the lagoon discharged their sediments in its proximity and progressively connected it to the mainland.

The preservation of Venice's water produced great environmental changes in other places and bore high costs for subaltern communities. Uneven power relations, among others, hit the fishermen communities, for whom the transformation of waterscapes was not particularly desirable as it forced them to adapt, in particular their fishing, to varying environmental conditions.

One of the most reputed hydraulic engineers of nineteenth-century Venice, Pietro Paleocapa celebrated the farsighted politics of his predecessors because, as he argued, they always gave priority to the lagoon of Venice over any other interests (Paleocapa 1819). As much as he was right about the efficacy of his forerunners, he did not perceive the power relations that were at the basis their activity. Social relations informed Venice's hydrology as water politics were guided by specific interests and an image of the city. Engineers progressively disconnected it from the territories, people and ecosystems that surround the lagoon, both physically as well as mentally. A solipsistic vision of Venice as an autonomous island-state made of Venice the embodiment of a dreamt of city islands, which served philosophers to phantasize about idealized societies. Among them, Thomas Moore's *Utopia* and Tommaso Campanella's *City of the Sun*.

The trope of Venice's insularity, far from a mere representation, acted as a blueprint for action. Past imaginations still hunt us, as they have established the material and mental conditions of Venice. As an acknowledged world heritage (a UNESCO site since 1987), the city and its lagoon constitute an inseparable unity but the preservation of 'the stones of Venice' (in John Ruskin's expression) faces countless challenges, not least the defense of their living spirit against commodification. Should not their specific lifestyle, the 'soul' of this locality, be preserved against forms of cultural extractivism that force the last 'indigenous people' to abandon their homeplace in order to escape the combined floods of tourists and rising sea levels?

Imagining an ecological future for Venice means to reconnect it with broader, even planetary, webs - those of the climate crisis and environmental sustainability. They force us to move beyond the image of the secluded island and make it reconstruct the ties with its surroundings. Relative to its proximate areas, one ought to first acknowledge that the Alps and the rivers are an integral component of Venice both from a geomorphological viewpoint as well as a cultural one. Natural processes of erosion and sedimentation have created the plains and the coastlines of Veneto. Not only the soil, but also the sand of Venice's strands, its *lidi*, are the product of waters' lasting labour. The paleochannels of submerged Ice-Age rivers have been a condition of navigability in the lagoon for memorable times. The rivers also served for the transportation of woods from alpine forests. They descended from there, bound together as rafts, along the Piave River and were later implanted in

the soil as the foundations on which the city could be erected. Those trees are also incorporated in the buildings as their scaffolding. And they were employed in the Arsenal for the construction of the fleet that once dominated the Mediterranean shores like a “forest at sea” (Appuhn 2009).

Till rivers flew into the lagoon, the aquatic connection with the inner territories was ostensible: the ‘hydrosocial’ link between the mountains and the sea was tangible. But after suzerain insulation became imperative, as a mission to be accomplished by all technological and political means, the experience of geographic, biological and cultural bonds between the Venetian waters and the fresh-water streams which meander from their elevated sources to the sea has been erased. The physical separation, in turn, sanctified the primacy of the island-capital over the mainland territories it ruled. This also produced staunch ecological blindness relative to natural-cultural interdependencies, which has unleashed programs of total management of rivers for land productivity and transportation, in the past, and energy production in the last century or so. Today’s hydro-geography embodies ecosocial hierarchies, which call for a re-connection in order to reestablish bonds of solidarity, horizontal ecological equity in decision-making and the inversion of top-down asymmetries in water management.

Among the waterways, the Piave River, which connects these three UNESCO sites - the Dolomites, the Valdobbiadene hills and the Lagoon of Venice - is exemplary of the ecosocial disconnection of the territory, its dis-integration, as it were, and the need to reestablish its continuity. In the industrial era, this river, which was for centuries the route of transportation of Alpine woods, has become a complex organic machine for the co-production of electric energy and agriculture. At the heart of this system, a protected natural area is still preserved, the Grave di Ciano. This is a former bending of the river, which is now protected in the framework of the European Union Natura 2000 network, both a *Special Area of Conservation* and *Special Protection Area*, according to the European Environmental Agency. Yet, this place is now threatened by climate change. But paradoxically, this happens in the name of ‘climate adaptation’ itself. Indeed, this oasis of biodiversity of about 940 hectares risks being destroyed and re-engineered as a gigantic flood retention basin which has been conceived as a measure against more frequent extreme events deriving from higher global temperatures. Current controversies over the future of this area involve the local community, civil society, experts, and politicians. The unfolding of the debate and the search for alternative solutions show the political importance of environmental knowledge and the urgency of renewed democratic forms of education to foster aware and inclusive environmental plans.

Decisions about water and its flows have always been existential for humans, their ecosystems, and biodiversity. A political-epistemological outlook on Venice’s hydrology evidences the force of science, in connection with technology, as a means of world transformation. It also shows the non-neutrality of decisions concerning water and territory. Indeed, hydrology is politics in the deepest sense, because it organizes the distribution and destination of the most precious element of life and reorganizes and constantly shapes the territory in accordance with visions which are political as far as they affect large societal bodies and shared views. Dreams of Venice as an insular utopia, the expression of an ideal society, served commercial, defensive and political strategies in the past. Those dreams have changed their function but still inform widespread perceptions and representations of the water city and its lagoon, as physically and mentally separated from the land by artificial means, especially the diversion of all rivers that once connected it to the Alps. In Venice, the environmental crisis is at once a cultural crisis. The future of its material existence coincides in many ways with that of its people and their bonds, to be re-established, with their natural, socio-political and mental settings, from the Alps to the sea.

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13

An Archipelago of Ecological Care: The 'Reclamation' of the Island of Sant'Andrea

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Notes

This lesson explains how contemporary artistic and curatorial practices can effectively contribute to so-called 'ecologies of care', protecting the dignity of life and human rights along with the rights of nature, and encouraging critical thinking, emotional involvement, ethical responsibility, and public imagination for the well-being of the Earth. The Venice lagoon, with its islands and natural/cultural ecosystem, is taken as a case-study – in particular, the island and fort of Sant'Andrea.

The report of the United Nations' *Intergovernmental Panel on Climate Change* (IPCC) of 28 February 2022 states that small islands are among the places most threatened by the environmental crisis. Despite being extraordinary examples of resistance, adaptation, and cultural and biological diversity – in their unique balance between land and water – small islands have been rendered vulnerable by climate change. Subject to the double threat of frequent flooding, caused by rising sea levels and extreme rainfall, and drought, caused by the opposite problem of water scarcity, these conditions, along with pollution, are contributing to the gradual decline of the rich ecosystems that characterise small islands. These ecosystems include, among others, coral reefs in tropical oceans and salt marshes in lagoons. The ultimate risk is their complete submergence, whether as individual entities or as entire archipelagos, like a modern-day Atlantis.

However, despite the uncertainty of the future and the urgency of extreme climate scenarios, islands provide effective examples of local sustainability that can also be replicated in other parts of the world to promote positive and collective change on a global scale.

As Édouard Glissant, the famous theorist of archipelagic thought, explains in his book dedicated to the coast of Lamentin, a small town in Martinique, his home island: "We can start from a tiny corner of the world, a real place. We can start from this real little place located in an archipelago, a small archipelago of the world, and from there live the life of the world in a global sense" (Glissant, Obrist 2021, 58, 67). This apparently utopian vision is in every respect concrete and applicable from the Caribbean to the Mediterranean Sea. For Glissant, utopia is neither an object, nor a goal, nor even a dream, but rather "what is missing to us in the world [...], it is about accepting the idea of change" (111) – and therefore fully achievable.

Let's take an example close to us, Venice and the islands of its lagoon. It is a fact that the Venetian archipelago is one of the most endangered in the world. Although it has always had to deal with the phenomenon of *Acqua Alta* (high tide), in recent years it has been experiencing more and more exceptional floods, which can practically be defined as anthropogenic disasters. After the historic *Aqua Granda* (big flood) of 4 November 1966, the peak was reached on 12 November 2019, as documented by the apocalyptic images broadcast worldwide. These extreme weather events have tested both the lagoon's ecosystem and the centuries-old negotiation between the natural environment and the anthropic landscape that the Venetians have carried out. Nevertheless, Venice seems to be a symbol of enduring resilience. It has thus become not only a privileged place to observe how planetary changes manifest themselves locally, but also a paradigm for understanding how to face future challenges.

This text, originally conceived for a recorded lecture, is a revision of Baldacci 2023.

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Undoubtedly, Venice is not the only example of insularity that can be taken as a large-scale adaptable model. The biogeographer Sietze Norder sees islands, each with its own local peculiarities, as microcosms, i.e. worlds in miniature, where best practices, which are determined by more sustainable relationships between human beings and nature – from energy autonomy and food independence to ecotourism – take root faster than elsewhere.

Despite being an ecosystem at risk, where exceptional floods – temporarily mitigated by the MOSE mobile dam system – combined with the passage of large cruise ships and overtourism, represent the height of the environmental and social crisis, Venice also functions as a microcosm. Within this context, it is possible to observe, imagine, and adopt sustainable attitudes and solutions that result from a constant rebalancing of the relationship between humans and nature. Being aware of the changes that Venice is facing as a consequence of the climate crisis, learning from them, and taking care of the city and its lagoon is an increasingly urgent ethical and political action to try to guarantee its survival. At the forefront are its few but tenacious inhabitants: a small community where vernacular knowledge has been handed down and where conscious citizens – including activists, cultural workers, artists, and researchers – are promoting a new ecological awareness in order to rethink (environmental, social, and cultural) adaptation practices in the present for the future – because Venice is not dead yet.

The themes of care and of what have been termed ‘ecologies of care’ from a variety of disciplinary perspectives – including medical humanities, feminist and gender studies, environmental humanities, and visual and performing arts – are more pressing today than ever, especially after the COVID-19 pandemic raised awareness of the need to invest more time, attention, and resources in all the different relationships that defines our being in the world or, to put it with Donna Haraway, our being *with* the world.

As has been pointed out, the proliferation of care themes in the arts and culture, especially in curating, is not just a fad, but a response, on the one hand, to the ‘crisis of social and ecological care that characterises global politics’ and, on the other, to the ‘more recent professional crisis of curating’. As a result, there is a widespread call for both a curatorial focus on the primacy of caring for all forms of life and a shift in curatorial practice that brings care, understood in a social and political sense, to the fore.

In order to initiate this change and make it effective, by turning curating into a set of ethical and political practices capable of contrasting the still widespread capitalist, colonialist, racist, and sexist attitudes, care must be chosen as a method. Caring with mutual respect, by protecting the dignity of life and human rights on a par with the rights of nature, means being able to use institutions and infrastructures in a more sustainable way, making them (eco)cultivated, that is updated and informed with respect to today’s pressing issues. And even before that, it means freeing our collective imagination from stereotypes through art and culture, and granting bodies and ideas a space for action that is as broad, participatory, and inclusive as possible.

This is a specific form of ‘curatorial activism’ that represents a call to action for both the curator as such and the artist, the researcher, and the cultural worker. Unsurprisingly, these roles are often intertwined in fieldwork, contributing to a continuous redefinition of practices – albeit in the specificity of individual knowledge and experience – and establishing profitable collaborations.

From this perspective, Venice is a particularly interesting case study. A number of artistic and cultural projects focusing on care, awareness, and empowerment in relation to local environmental concerns have taken root – experiences that are also widespread among islands and cities on the water at a global level – and have promoted more responsible interactions with the environment. As an insular community – in other words, a ‘miniature’ community, but with international relations – Venice

is also particularly prone to the kind of collaborations that are actually taking place between the many organisations, groups, and individual actors involved in the various initiatives that have sprung up in the city.

One of the most recent projects that can be considered an exemplary case, although it is still too early to detail its future activities and developments, is the reclamation of the Island of Sant'Andrea, which serves as a research space that brings together nature, culture, and public commitment. The word 'reclamation' is used here in reference to the ecological actions undertaken by land artists in the 1960s and 1970s, such as Robert Morris, Helen Mayer Harrison and Newton Harrison, and Robert Smithson.

Located in the northern lagoon, Sant'Andrea is one of the smallest 'atolls' of the Venetian archipelago. At the forefront of this artistic and curatorial activism action are the Microclima collective, founded in 2011 by Paolo Rosso, and the artist Giorgio Andreotta Calò - supported by the TOCIA! gastronomic collective, led by Marco Bravetti, which focuses on the changed food needs resulting from the climate emergency. With civic sense and love for their city, they have joined forces to try to make life on the island sustainable and prevent it from falling prey to property and tourism speculation, as has happened to other abandoned lagoon islands, which can only be reached by private boat. Although the initiative has only recently been officially launched, through the winning of a public competition, it has a long history. The initial idea dates back to more than ten years ago, when the land artist Richard Nonas was invited to rethink the anthropic waterscape of the island. Historically, Sant'Andrea was an important military fortress built in the sixteenth century to defend Venice, and its ruins are still there, though partly reclaimed by native vegetation.

The 'reclamation' of the island of Sant'Andrea is in line with another non-profit initiative for environmental and cultural regeneration: the nearby Island of the Lazzaretto Nuovo - first the site of a Benedictine monastery, then a hospital (whose methods of treating and preventing infections, especially in the case of the plague, were so effective that they were known abroad) and an Austro-French military fortress - has been turned into an eco-museum open to the public, as part of the wider project for the redevelopment of the Venetian Lazzaretti. The highlight of the naturalistic visit is the walk along the 'Sentiero delle Barene' (Salt Marsh Path). For about one kilometre, this path immerses the ecotourist in what is one of the lagoon's most valuable and threatened habitats. As semi-submerged land, the salt marshes are not only home to a unique fauna and flora, but also play an essential role in naturally maintaining the level and circulation of the lagoon's waters.

To return to Sant'Andrea, Andreotta Calò and his comrades have so far leased a small part of the island, but their project is much more ambitious and far-reaching. They plan to participate in another forthcoming tender for state property to manage the rest of the island, where the remains of the military structures actually stand, in order to preserve it as a landscape and cultural asset - at least for the next few decades. There is therefore a strong civic, ethical, and militant commitment to make Sant'Andrea - one of the last places in the lagoon that is still 'public' in the deepest sense of the word - a centre for research and debate.

But what can be done? This is the main question posed by Giorgio Andreotta Calò, Paolo Rosso, and Marco Bravetti. Perhaps the best answer is 'nothing'. However, this does not mean inaction, but rather a kind of active idleness. Indeed, it requires an enormous effort to resist the temptation to transform even the island of Sant'Andrea into something else, as has happened to other places in the lagoon. Therefore, one must change perspective and look at the island as a unique place to imagine the future.

At the beginning of the 1970s, the visionary György Kepes, in the introductory essay to his *Arts of the Environment* (1972), which he eloquently entitled "Art and Ecological Consciousness", anticipated the role that the artist, moved by a concern

for others and for the environment, would come to play in the late twentieth and early twenty-first centuries, facing the various challenges of an era characterised by profound “displacement, disillusionment, and social upheavals”. In Kepes’s words, the artist

has had to cut through the ego-tangled scene to reach the free horizons that held a promise of the new ‘common’ of man-environment. Clearly, the artist’s sensibility has entered a new phase of orientation in which its prime goal is to provide a format for the emerging ecological consciousness. The tasks he assumes differ from previous tasks in kind as well as in scale. The values he uncovers become the values of us all, giving sharpness and definition to the need we sense for union and intimate involvement with our surroundings. Thus the artist has moved from a marginal role to a more central position. (1972, 9-10)

Contemporary artists who care about the environment, producing works and actions that create an ecosystem of thought, explore and challenge different fields of knowledge through an experimental and free approach, encouraging critical thinking, emotional involvement, ethical responsibility, and public imagination on pressing contemporary issues for the well-being of the Earth.

What can we hope for the future well-being of Venice and its lagoon? First of all, that initiatives and practices such as those just described will continue to grow, through both private and public initiatives, and will encourage the collaboration and involvement of different communities, both local and international, in order to give rise to ever more effective (and affective) forms of responsibility.

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14

Venice and the Extractivist Regime of Mass Tourism

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Notes

This short text explores the phenomenon of overtourism and its impacts on cities like Venice, drawing from political geography, critical development studies, urban studies, and the environmental humanities. It examines how the expansion of extractivist dynamics – traditionally focused on natural resources – now extends to social, economic, cultural and ecological domains, providing a unique perspective for understanding key dimensions of the Anthropocene. The social conflicts resulting from the aggressive neoliberal marketization of urban spaces, as exemplified by Venice, expose the extractive logics justifying mass tourism: the commodification of the commons and of cultural heritage embodies a form of symbolic extraction that parallels the material extraction of resources, reshaping the social, economic, and ecological landscapes of cities. This extractivist logic, intensified by neoliberal forces and promoted by several political actors, transforms urban life, aesthetics, and ecology at once.

It is difficult to imagine a city that cohabits with the dramatic social impacts of overtourism more than Venice. A city crystalized in the global tourist imagination since the eighteenth century, its form and contents have been reshaped by massive flows of visitors throughout the twentieth century and in particular in the last 20 years.

A black swan event such as COVID-19 has completely halted the touristic industry operations worldwide for a year, but the tourism in Venice has rebounded due mainly to the enduring appeal of the city as a destination, and the insistence from local and regional politics to be fully dependent on this type of industry.

The rise of short-term rental platforms like Airbnb has intensified the mutation of certain places around the world into tourist destinations, a process sometimes referred to as 'destinization'. Besides Venice, this is a phenomenon affecting many other tourist localities around the world. Cities and popular spots such as Barcelona, Chiang Mai, Mexico City, Bali, and Medellin, just to name a few, now face the challenges of a specific type of tourism-led gentrification of planetary scale, which involves the displacement of local populations, and the erosion of the urban commons as a result of the rapid growth of the short-term rental market.

As some have argued, these dynamics seen collectively and holistically, can be understood as part of a broader shift towards an 'extractivist' form of industry, in which the immediate extraction of value from local resources and communities is prioritized over their long-term sustainability and well-being. This process also involves local and national administrators and governments in an actively complicit role, as they protect and even expand the presence of these economies in the face of growing inequality and social and environmental injustice.

In Venice, this has led to a situation where the number of tourists visiting the city far exceeds the number of permanent residents, creating a phenomenon that some researchers have termed 'hypertourism'. Visitors to the city become users or consumers of the spaces and of the touristic services offered, feeding a cycle in which more and more spaces and services are transformed into touristic businesses to cater to an ever-growing, increasingly monocultural, space-intensive industry. As a result, the city becomes defined as a place with an unchangeable basic tourist vocation, not too dissimilar to a theme park or a resort island.

The accelerated exacerbation of these processes has already had significant consequences for the social fabric of Venice, with many residents feeling increasingly marginalized and alienated in their own city. As Urban Studies scholar Giacomo Maria Salerno notes, the city historically formed is no longer lived: it becomes an object of cultural consumption based on aestheticism aimed at tourists eager for shows and picturesque. Some researchers have referred to this transformation affecting

Venice as Disneyfication, drawing attention to the ways in which the city's way of life and its commons are being replaced by a sanitized, commodified, caricatural version designed for mass touristic consumption and for the optimisation and management of tourist flows.

The cruise industry has played a particularly significant role in the overtourism phenomenon in Venice as its operations and infrastructure produce extractive relations that sequester and exploit tourists, local communities as well as the natural environments of the Venetian lagoon, on scales that are massive and impossible to manage in a sustainable way. The gigantic physical size of contemporary cruise ships has put enormous strain on Venice's socio-natural ecosystem. The negative impacts of the cruise industry include air and water pollution, the structural erosion of the city's fragile foundations, and the commodification of its cultural heritage. Despite these evident problems, however, local and national governments have often been eager to support the continued growth of the cruise industry in Venice: not seeking to regulate the industry and mitigate its negative impacts, authorities have often prioritized the short-term (concentrated) economic benefits of mass tourism over long-term (distributed) well being of the city. As a result, efforts to develop alternative forms of tourism and to revert the Disneyfication of Venice have so far proven ineffective.

The concept of extractivism, and more specifically neo-extractivism, offers a useful theoretical lens through which to understand these processes. Particularly developed in the context of critiques to developmentalist policies in the Latin American context, extractivism refers to a model of economic development that is based on the large-scale extraction and export of natural resources, often with little regard for the medium and long term social and environmental costs. According to political ecologist Eduardo Gudynas, extractivism can be defined as the appropriation of natural resources in large volumes and/or high intensity, where half or more are exported as raw materials, without industrial processing or with limited processing. Neo-extractivism helps to take this analysis a step further by considering the role of the state in facilitating and promoting extractive processes. In many cases, governments actively support and subsidize extractive industries, often in the name of economic growth and development. This has certainly been the case in Venice, where successive local and national governments have pursued a 'tourism-led growth model' that prioritizes the expansion of the tourism industry above all else, as a goal of its own. Investments and planning have focused on building the mainland while the renovations carried out through the funds of the Special Law of 1973 aimed to rescue Venice have had the effect of revaluing real estate and increasing rents, thus favouring in both cases the abandonment of the island of Venice. This model has led to a situation of extreme economic dependence on tourism, with the city's economy becoming increasingly narrow and specialized, as well as concentrated in the hands of a few.

For some scholars, tourism constitutes an essential part of the urban declination of extractivism, with the dynamics of the tourism industry in cities like Venice bearing many similarities to those of more traditional extractive industries such as mining. Just as mining companies seek to extract maximum value from mineral deposits, often at the expense of local communities and ecosystems, so too does the tourism industry seek to extract maximum monetary value from the cultural and historical heritage of cities like Venice. This process of commodification and appropriation of the common heritage of the city by private interests is a key feature of what can be termed 'urban extractivism', and it goes hand in hand with the development and proliferation of platform capitalism.

As a result, Venice has become highly vulnerable to external shocks, such as the COVID-19 pandemic, which brought global tourism to a standstill and exposed the fragility of the city's socio-economic model. The pandemic has had a devastating impact on the city's economy, which has led to widespread job losses and business closures.

Thinking of Venice through the neo-extractivist lens, but also, conversely, thinking about the planetarization of extractivism through Venice, makes us realize even more the need for a radical re-imagination of the role of tourism in the urban economy. Opposing the touristification of a city like Venice (but also of other cities affected by mass tourism) means, as Salerno puts it, to affirm that ‘the commons that built them and inhabit them have not ceased to be able to produce, and that their capacity to care for the material substratum of their subsistence has the capacity to oppose the forces that push in the direction of their expropriation’. In other words, the forms of resistance to the extractive logic of tourism are already present in the fabric of the city: in the commons that have shaped it over time, and in the ongoing practices of care and conflict through which local communities maintain and reproduce their urban environment and the web of life sustaining it.

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15

Law and Environment: Ecocide and the Rights of Nature

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Notes

This essay examines two emerging legal concepts: the proposed international crime of Ecocide and the growing Rights of Nature front. These radical changes challenge existing environmental laws and provoke technical and philosophical questions, here analysed through the unique case study of Venice.

Law and the environment are becoming ever more intertwined, with their relationship gaining growing attention in both academic and public spheres. Today, two key issues stand at the centre of the debate, drawing the focus of experts, social movements, and environmental organizations alike. These topics not only spark conversations among specialists in the field but also resonate with the general public, reflecting the increasing awareness and urgency surrounding environmental challenges in contemporary society. The two crucial issues we aim to isolate and critically evaluate are the proposal for an ecocide law and the so-called rights of nature.

Ecocide has a powerful discursive and political effect and can serve as a way of identifying the growing, massive, immense, and outrageous acts and effects of large-scale and long-lasting destruction of entire ecosystems and biodiversity. Ecocide is a word – much like biodiversity – that has become a political slogan. It is as if a spontaneous understanding of what ecocide actually means is enough, as if the word speaks for itself.

In this commitment against environmental destruction, the proposal of an ecocide law, or more precisely, the inclusion of the crime of ecocide within the Rome Statute of International Criminal Law, raises a series of issues. The term 'ecocide' has no clear definition yet but a growing green and critical criminological literature advocates for its introduction as a crime along the lines of human genocide. This crime is attributed to corporations (Whyte 2020) and states (White, Kramer 2015) as well as ordinary behaviours that contribute to the climate breakdown (Agnew 2020). A recent proposal consists of establishing a climate change criminology (White 2018). Although ecocide itself is a legal hypothesis, critical or radical criminological approaches tend to not interface with legal techniques, perhaps considering them too entangled with power. As noted by two criminologists, Natali and White (2019, 188):

As a broad generalisation, ecocide is defined first and foremost by the destruction, degradation and demolition of ecosystems and specific environments, with harmful consequences for the living creatures within these. When this occurs due to particular types of human activity, then ecocide also becomes terminology that describes a particular form of *criminality*. Specific acts of environmental destruction, within particular war-time contexts, are presently officially considered international crimes. For some, however, this particular legal definition is too restrictive, and especially given present environmental trends including global warming, does not address those activities that may have even greater impact than those associated with military action.

As is often the case, what sociology or criminology considers reductive sounds confusing or all-encompassing to legal science; vagueness certainly cannot be useful, indeed it is dangerous, for legal purposes. First and foremost, as Françoise Tulkens (2016), chair of the International Monsanto Tribunal, highlights, the principal prob-

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lem is to clearly define what one intends to punish. This is the principle known to jurists as the principle of legality.

The understandable intentions of expansion (and not reduction) that are typical of the social sciences, even though they are proposing, as mentioned above, a definition of the concept of ecocide must therefore be carefully evaluated, risking going in the direction of a broadness that is the opposite of a guarantee. In other words, for the social sciences not to deal with a legal definition that respects fundamental rights is risky. Indeed, to dispense with law simply risks being ineffective, that is, dispensing with a powerful toolbox to advance social struggles (Chiaramonte 2022).

There are many types of conduct, both lawful and unlawful, that damage and deplete available resources; and, those considered illegal are already punishable. Therefore, the potential introduction of a new international crime of ecocide requires not only the identification of conducts that are criminally relevant but which among them are of such gravity as to reach the appropriate threshold of disvalue for this type of crime (Fronza 2021, 2421-2).

In a nutshell, ecocide, as an autonomous offense, requires establishing three main elements: the threshold of seriousness of the damage, a formulation that covers the diversity of concrete behaviors and the *mens rea*, that is, the criminal intention (Fronza and Guillot 2015).

These questions encourage us to rethink the concept of ecocide by addressing the complexities of environmental harm, the anonymity of its causes, and the potential limitations of punitive justice in tackling these global crises. Overall, these efforts seek to confront the environmental and climate challenges of our century, positioning the law at the forefront of crucial transformations. Legal frameworks are vital for developing effective solutions and ensuring justice in this context.

Parallel to the ecocide movement, a growing force pushes for the recognition of 'Rights of Nature' (RoN): a general recognition of 'Nature' as a living and acting entity, invested with its own legal personhood. The movement pushing for RoN has come and gone in waves, first in the 70s, with Law professor Christopher Stone asking "Should Trees have Standing?" - and being consequently ridiculed by many of its peers - and more recently in the Constitution of Ecuador in 2008.

After a series of indigenous uprisings, then-President Rafael Correa updated the country's Constitution based on the concept of *sumak kawsay* (a Quechua neologism commonly translated to 'good living') and on the traditional consideration of 'Nature' as 'Pachamama': 'Mother Nature'. According to the new rules any citizen, as an integral part of Nature, can legally act in its name, bringing therefore any legal person - human or not, for example a Corporation - to court. This brought a series of legal actions, especially in recent years: half of the 55 cases being debated between 2019 and 2022. In 2021, in a landmark case, Nature won a case against the Minister of Environment and Water and the National Mining Company, protecting the forest of Los Cedros¹ against mining developments.

In the case of Ecuador Nature is non-defined and limitless, clashing with established legal concepts and creating problematic judgment cases, first and foremost raising the question of stewardship and of who should be entrusted with the power and responsibility to speak for such an abstract being. At the same time, the tool seems to be working as a deterrent for new extractive and damaging economic initiatives. Here *Pachamama* becomes a cultural argument for the institution of a legal principle, but does it solve the human/nature divide? Rather than a philosophical solution, it seems like an answer to a necessity: that of trying to fit a necessarily human-shaped tool to represent something enormously more-than-human. This dilemma accompanies the movement since its very inception. Just as 'streams and

¹ See Earth Jurisprudence Monitor's overview on the case: <https://ecojurisprudence.org/initiatives/los-cedros/>.

forests' do not have the power to speak for themselves – at least not in a human voice needed in court – neither do corporations, or States, infants, municipalities and universities. “Lawyers speak for them, as they customarily do for the ordinary citizen with legal problems” (Stone 1974, 8). A double edged sword that invites cautious development of legal tools.

Another major case is that of the Maori of Aotearoa/New Zealand. Here, the Te Urewera forest in 2014 and the Whanganui river in 2017 were granted legal personhood on the basis of the cultural norm according to which such ecosystems form part of the communities. A famous saying that enshrines this concept is *Ko au te awa, ko te awa ko au* (I am the river, the river is me). Differently to the Ecuadorian case, in which all citizens can act for all nature, the Whanganui and the communities around it form part of the same entity, and on the basis of that the legal personhood is granted and the stewardship system identified. To this day, the Maori way remains untested, perhaps a monument to its deterrent effect.

Other cases have proliferated in recent years: a case in India was overthrown in 2017 because of the transnational nature of the Ganges and Yamuna rivers and the lack of clarity in the stewardship system. The first European case had to wait until 2022, with the Mar Menor – a large saltwater lagoon in the Murcia region. Locals are currently striving to keep the law that recognises legal personhood to the Mar Menor operating, and at the same time develop the adequate tools to represent it.

In this scenario, we can highlight that all Rights of Nature cases globally have been developed with wildly different formats and tools, mirroring the philosophies of the communities that brought them in place and the specificities of the ecosystems represented.

All Rights of Nature laws treat Nature as a legal subject with rights. In all cases, Nature is conceptualized at an ecosystem level rather than at the level of individual flora and fauna. The laws at least implicitly recognize that humans are part of these ecosystems, but they vary in how expansive the boundaries of rights-bearing Nature are (Kaufmann, Martin 2021, 62).

The full impact of RoN is yet to be seen, even though in some cases they brought historical decisions. The main risks such a tool might run into are very similar to the ecocide ones: a definition that is too vague and blurry, leading to ineffectiveness, and a lack of precision in identifying an adequate system of stewardship. Such intricacies lie at the very bottom of the philosophical problem: inviting Nature, an outstandingly non-human entity, into a legal system devised by humans for humans. An inevitably anthropocentric system.

Beyond legal journeys and procedural mazes, the core of such new legal tools invites for a far-reaching transdisciplinary reflection. Only once this complexity is taken into account, new and apt legal forms can participate in laying the basis for a systemic change: one that sees humans as part of a broader cosmos, rather than the centre and ruler of it.

Humanity seems to be crossing a crucial time to re-think its ecological governance model, and can craft new tools based on pre-existing ones. Venice's waters have always been an essential agent in the life of the city – and formerly the Republic – with institutions such as the Magistrato delle Acque and the Proti, experts who would be consulted for the administration of the Lagoon. In modern times, a special law issued in 1973 declared the protection of the Lagoon a matter of national interest, and placed the Italian Republic as the guarantor of its 'landscape, historical, archeological and artistic environment', bound to protect it from pollution and preserve its hydrological balance.² UNESCO also protects Venice and its Lagoon as

² Law 16 April 1973, no. 171. Available (in Italian) here: https://www.gazzettaufficiale.it/atto/serie_generale/caricadettaglioAtto/originario?atto.dataPubblicazioneGazzetta=1973-05-08&atto.codiceRedazionale=073U0171&elenco30giorni=false.

World Heritage, highlighting the unique role of the natural environment in the city's history and culture, its fragile and dynamic nature.

Despite these measures the Lagoon finds itself in a deeply unbalanced state, with ineffective decisions as climate change and intense human activities reinforce each other to turn it into an extension of the Adriatic Sea.³ Venice and the Lagoon are one of the world's post children when it comes to climate change, and are consequently studied and analysed constantly. Perhaps, could a new approach to ecological governance emerge from their brackish waters?

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³ Experts and activists alike call its current state a 'braccio di mare', an arm of the sea.

Unit 4 – Glossary

Notes

Hydrosociology	It is an environmental pathway to sociology that considers the inextricable connection between societies and water. It enlarges the scope of hydrology itself from a technical and naturalistic form of knowledge to a complex interdisciplinary one. Hydrosociology clarifies that water cannot be understood as a merely material and impersonal element existing in abstract, independently from the uses and transformations that humans and their technologies impart to its cycles.
Political epistemology	This is a theory of knowledge (epistemology) that investigates the political dimension of science in relation to its origin, validity and orientation. This perspective comprises questions of values and ideology as well as questions related to the material transformation of the societies and ecosystems. As for its methodology, it embraces a contextualist approach to science: this considers the practical aspects of science, its social-economic roots as well as its environmental conditions and consequences.
UNESCO World Heritage	UNESCO (the United Nations Educational Scientific and Cultural Organization) understands world heritage as a legacy from the past that ought to be recognized and preserved for future generations. The 1972 <i>Convention Concerning the Protection of the World Cultural and Natural Heritage</i> stressed that world heritage is relevant to humankind as a whole. It also pointed out (Article 1) that cultural sites can refer to ‘combined works of nature and man’ and, conversely (Article 2), the value of natural sites comprises, alongside the scientific value, also the aesthetic one. Such a cultural-natural conception is consonant with more recent concerns about sustainability and the Anthropocene perspective.
Natura 2000	This is a network of protected natural areas designated in accordance with the European Environmental Agency. It is the contribution of EU member states to the protection of biodiversity in line with the Conservation of European Wildlife and Natural Habitats which was signed in Bern in 1979.
Curatorial activism	A term used to designate (see M. Reilly) the practice of organizing art exhibitions with the main aim of ensuring that certain communities of artists are no longer excluded from the master narratives of art. It is a practice that commits itself to counter-hegemonic initiatives that give voice to those who have been historically silenced or omitted altogether – and, as such, focuses almost exclusively on work produced by women, artists of colour, non-Euro-Americans, and/or queer artists.
Ecologies of care	Are a set of practices etymologically linked to the term ‘curare’, namely ‘to care’ and ‘to cure’, which form the root of the word ‘curating’. Within the context of contemporary art, these practices develop new modes of art and cultural processes that enable meaningful social and environmental encounters and create lasting and transformative relations.
Reclamation art	Is an artistic practice that transforms discarded or neglected materials and landscapes into new works of art, often highlighting environmental issues and promoting sustainability. This form of art emphasizes the relationship between humans and nature by addressing ecological degradation through creative processes. By repurposing waste and abandoned spaces, reclamation art not only raises awareness but also inspires a cultural shift towards more sustainable practices.
Extractivism	An economic model based on the large-scale extraction and export of natural resources with little regard for the long-term social and environmental costs. In the context of tourism, extractivism refers to the prioritization of short-term economic gains over the well-being of local communities and ecosystems. This model often involves the commodification of cultural heritage and the appropriation of common resources by private interests, leading to the displacement of local populations and the erosion of urban commons.
Disneyfication	The transformation of a city or place into a sanitized, commodified, and caricatural version of itself, designed for mass touristic consumption and the optimization of tourist flows. In Venice, Disneyfication has led to the progressive replacement of the city’s commons with a simplified, standardized, and inauthentic representation designed to the expectations and desires of tourists.

Platform capitalism	The growing influence and dominance of digital platforms, such as short-term rental platforms like Airbnb, in shaping the economic, social, and spatial dynamics of cities. In the context of tourism, platform capitalism has intensified the transformation of residential spaces into tourist accommodations, contributing to the displacement of local populations and the erosion of urban communities. The rise of platform capitalism goes hand in hand with the commodification and appropriation of the common heritage of cities like Venice by private interests
Special Law of 1973	A comprehensive piece of legislation aimed at safeguarding Venice and its lagoon. Enacted after the devastating flood of 1966, this law represented the first organic regulation for the protection of Venice. The interventions under this law aimed to preserve the city of Venice, its lagoon, and its landscape, historical, archaeological, and artistic environment, while also protecting its hydraulic equilibrium, preventing atmospheric and water pollution, and ensuring the socioeconomic vitality of the area. However, the Special Law faced numerous limitations and criticisms over the years, with calls to reform and update it. While the city improved in terms of conservation and maintenance of monuments and buildings, and controversial flood barriers were built, the law did not solve many problems, such as the issue of tourist monoculture, the exodus of residents from the city, the full functioning of the port, and the balance of the lagoon ecosystem.
Ecocide	'Ecocide' means unlawful or wanton acts committed with knowledge that there is a substantial likelihood of severe and either widespread or long-term damage to the environment being caused by those acts.
Rome Statute of International Criminal Law	The Rome Statute of the International Criminal Court (ICC) is the founding treaty of the ICC, adopted in 1998 and effective since 2002. It defines the ICC's jurisdiction over crimes of genocide, crimes against humanity, war crimes, and the crime of aggression. The statute establishes key principles of international criminal law, such as individual responsibility and the inadmissibility of amnesty for the gravest crimes. Signed by numerous states, the Rome Statute marks a significant step toward global justice and the fight against impunity for international crimes.
International Monsanto Tribunal	The International Monsanto Tribunal was a symbolic, civil society-led tribunal held in 2016 to assess Monsanto's activities in relation to human rights, environmental harm, and the health impacts of its products. Though not legally binding, the tribunal followed the framework of international law and aimed to evaluate Monsanto's liability for alleged ecological destruction, violations of the right to health, and crimes against humanity. The panel of judges issued advisory opinions, calling for stronger international regulations on corporate practices affecting the environment and human rights. It highlighted the need for greater corporate accountability in the agricultural sector.
Rights of Nature	The term 'Rights of Nature' means the recognition that an ecosystem – including trees, oceans, animals, mountains – have rights similar to human beings. Rights of Nature is about balancing what is good for human beings, as well as for other species and for the planet as a whole. It is the holistic recognition that all life, all ecosystems on our planet are deeply intertwined. Rather than treating nature as property under the law, rights of nature acknowledges that nature in all its life forms has the right to exist, persist, maintain and regenerate its vital cycles. Under current international environmental law, ecosystems and non-human elements have no standing. This premise is a radical but natural departure from the assumption that nature is property under the law.
Stewardship	Stewardship is a common practice that entails the responsible planning and management of resources. The concept can be applied to different fields: environment and nature, economics, health, places, property, information, theology, and cultural resources. It is generally recognized as the acceptance or assignment by one person or entity of responsibility to shepherd and safeguard the valuables of other persons or entities.

