

The environmental history of the Catalan-speaking lands

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ABSTRACT

Environmental history is a discipline with its own paradigms and methodology that is concerned with studying the coevolutionary relations between the environment and the social system. This article offers a historiographic sketch of the environmental history of the Catalan area. Based on a review of the scholarly literature, this article identifies the main themes, avenues of research and analytical keys and evaluates the way that the complexity of socioenvironmental conflicts has been explored.

KEYWORDS: historiography, environmental history, environmental humanities, environment, ecology, nature.

Environmental history, ecological history or ecohistory is concerned with studying the coevolutionary relationships between the environment and the social system. It can be viewed as both a perspective that coexists with the traditional historical accounts and as a cross-disciplinary field within the social-environmental sciences derived from critical human ecology, urban ecology, industrial ecology, ethno-ecology, ecological anthropology and the disciplines harboured under the umbrella of the environmental humanities, such as ecocriticism, ecolinguistics and ecosemiotics. According to this meaning, environmental history is a specific field of historical knowledge with its own paradigms and methodology which is influenced by both the different branches of the human and social sciences and by a kind of ecological science that incorporates the historical analysis of concepts like ecosystem, energy flow, metabolism and technology transfer. As an emerging discipline, it coevolved thematically and methodologically apace with the different stages in the social-environmental crises, along with their different, ever-shifting individual, social, political, scientific and chance perceptions. As an outcome of environmental crises, it is critical and has a strong academic commitment, with the goal of achieving a historiographic renovation, as well as a social and political commitment, with the goal of being a public-oriented applied history which provides answers to environmental problems and suggests alternative development models.

The objectives of this article are first to present the genealogy of environmental history within the Catalan-speaking area and to explore the multiplicity of issues it has dealt with; secondly, to outline the main veins of analysis; and third, to examine how they have been used to address the complexity of social-environmental conflicts. To achieve this, we shall briefly examine the historical periods which attended to the formation of the discipline, outline the main elements shared by the different branches that have arisen, and provide a summary of the main avenues of research undertaken based on the environmental history of urbanisation and industrialisation, the history of pollution, historical agro-ecology, the history of the climate and finally, the history of environmental thinking.

GENESIS AND CONSOLIDATION OF THE DISCIPLINE

To include the environmental paradigm within the study of history, it was essential to accept the externalist epistemological theory in the study of science. In the mid-20th century, the progress beyond the debate between internalism and externalism acknowledged that scientific knowledge is affected by external factors, which meant introducing anthropological, phenomenological and ethnomethodological approaches into the discipline of the history of science, while for historical science, it meant consolidating the perspective of “total history” and accepting the concept of coevolution between ecological and social systems. Likewise, for ecological analysis, it meant incorporating notions of gender, ethnicity and

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class and considering methodological proposals of new scientific approaches, such as complexity theory and the concept of post-normal science.

In the 1960s to 1980s, the cohesion and institutionalisation of the scientific community around environmental history began first in the English-speaking world¹ and later in Europe, Latin America and Asia. This early period is when there was the strongest social and political commitment, although, according to some interpretations, this gradually vanished as institutionalisation took root.² By the 2010s, it was possible to recognise different generations of experts and to distinguish three main avenues of research: material, cultural and political environmental history. The convergence of all three avenues facilitated an analysis of the environment viewed as a conglomerate of objectifiable factors and subjective perceptions. The first one studies physical changes, both in themselves and in relation to society and manufacturing technologies; the second examines the definitions, representations, perceptions, ideologies, ethics and myths generated around concepts like environment, nature, pollution and climate; and the third studies the reactions, policies and laws that regulate interactions between individuals, societies and the environment. Regardless of whether or not all three are present simultaneously in a diachronic analysis, they all address problems that cannot be limited to either the classic timelines or a single academic discipline.

In the Catalan-speaking lands, the earliest approaches which incorporated the environment into historical study came from ecological economics, geography and the speciality of landscape science. Environmental history coalesced as a self-aware discipline during the 1990s, when Joan Martínez Alier and Anna Monjo founded the journal *Ecologia Política* (1991) and when the fields of history, geography and archaeology set forth methodological proposals and initiatives which kindled the debate with experts on the subject. Examples include the seminar held in Girona in 1991 entitled “Història ecològica i Història de la ecologia” organised by Ramon Garrabou and Joan Martínez Alier, with the presence of Piero Bevilacqua, Christian Pfister, Jean-Paul Deléage and Joachim Radkau, among others;³ the following year, the journal *Recerques* devoted a monographic issue to the topic;⁴ in 1994, Joan Martínez Alier described the objectives and main methodologies of ecological economic history in *De la economia ecològica al ecologisme popular*;⁵ around the same time, Ramon Garrabou and José Manuel Naredo initiated a series of interdisciplinary seminars which laid the methodological groundwork of research into agro-ecological history;⁶ the first thesis on historical climatology was read by Mariano Barriendos;⁷ and the *Archaeomedes* project was undertaken with the goal of analysing the anthropic and natural dynamics involved in shaping the Mediterranean environment, with the participation of experts from the Universitat Pompeu Fabra, the Universitat de Girona, the Universitat de Barcelona and the Universitat Autònoma de Barcelona.

The discipline became institutionalised in the 2000s, if we consider its inclusion in different university-based research groups and ongoing projects which went on to have significant repercussions on today’s scholarly output. They include the groups and projects led by Ramon Garrabou Segura, Enric Tello Aragay, Rosa Congost Colomer and Armando Alberola Romá, as well as those conducted around the *Seminari d’Estudis i Recerques Prehistòriques* of the Universitat de Barcelona and the *Institut de Ciències de la Terra Jaume Almera* (IIGJA), a continuation of the research institute founded in 1965 by Lluís Solé Sabarís.⁸

The acceptance of the ecological paradigm within Catalan academia is indebted to the longstanding, consolidated historiographic tradition of certain disciplines which had taken an interest in the diachronic analysis of nature, especially geography, natural history and the history of medicine, since the 19th century. Examples include the projects to restore the cultural and natural heritage undertaken by the *Renaixença* movement, scientific excursionism and botanical and natural history studies (especially the studies by Eduardo Boscà, Barceló i Combis, Odon de Buen y del Cos and Norbert Font i Sagué), as well as the influence of environmental education, scouting, naturalism, anarchism (which is keenly interested in nature), evolutionism and hygienism.

Throughout the 1960s to 1980s, several approaches erased the boundaries between history, science and geography following the methodological proposals of the Annals school and the new social history, or the models designed by Pierre Vilar, Pau Vila and Lluís Solé Sabarís. Examples include the historical studies of science and technology by José María López Piñero; studies within the speciality of landscape science by María de Bolós, Josep M. Panareda and Joan Sabí;⁹ and those developed within the circle of the journal *Geo Crítica* (1976), such as the ones by Horacio Capel and Luis Urteaga. Around the same decades, Manuel Sacristan and Joan Martínez Alier¹⁰ spearheaded critical theories such as economic ecology and political ecology, which were essential to shaping today’s environmental history; Ramon Margalef, Maria Rosa Miracle, Maria Àngels Cardona Florit and Ramon Folch forged ecological science in the study of ecosystems; and social and political ecological movements arose in the different Catalan-speaking lands in convergence with neighbourhood, feminist and anti-militarist movements.

The dialogic relationship among all of them and other events fleshed out the particularities of an environmental history which has deployed the three avenues mentioned above – material, cultural and political environmental history – and coalesced around a considerable variety of field of research. The greatest bulk of studies is in the environmental history of urbanisation and industrialisation, the history of pollution, agro-ecological history and climate history.

If we set out to undertake a global examination of the fields developed, we must bear in mind different factors

which hinder us in this undertaking and force us to be prudent in our assessment. There is quite a bit of dispersion among experts and different research groups; there is no actual association to bring them together; and it has only recently and discreetly been introduced into academic curricula, limited to university Master's programmes. In this sense, we could highlight the course taught by Agustí Nieto Galan, "Technology and Environment: A Historical Perspective", in the PhD in Environmental Sciences at the *Institut de Ciència i Tecnologia Ambiental* (Universitat Autònoma de Barcelona) between 1998 and 2002; and the "Environmental Thought" course in the Joint European Master Programme in Environmental Studies (Technische Universität Hamburg, Aalborg Universitet, Universitat Autònoma de Barcelona, Universidade de Aveiro) between 2009 and 2011. Since 2010, Armando Alberola has taught the course entitled "The Mediterranean World Facing Natural Risk in the Modern World" in the Inter-University Master's in Hispanic History and Identity in the Western Mediterranean (15th to 19th centuries) (Universitat de Barcelona, Universitat de València, Universitat d'Alacant and Universitat Jaume I de Castelló). And Enric Tello teaches "Environmental History: Energy and Territory" as part of the current curriculum in the Master's in Economic History (Universitat de Barcelona).

Furthermore, during the same years the purposes and methodologies of the discipline itself have shifted. As the definition of the subject of study has become more complex and self-organised, there is an increasing number of frameworks of reference created by ecology, human ecology, social ecology, ecological sociology and political economics which determine the relational variables between society and environment that can be extrapolated to historical analysis.¹¹ However, after more than two decades of scholarly output, it is possible to survey the field from the vantage point of a certain distance. By doing so, we can find numerous areas of common ground and mixture among the different fields. Below we shall outline six of the common elements of the scholarly output produced in the Catalan-speaking lands.

First, the influence of ecological economics is unquestionable. This is clear in the fact that essential to the environmentalisation of urban history, economic history, agrarian history or human geography is the acceptance of theories revolving around social metabolism, Georgescu-Roegen's theory of flows outlined in *The Entropy Law and the Economic Process*¹² and more recently the resumption of multiscale integrated analyses of the metabolism of society and ecosystems undertaken to simulate possible patterns of development.¹³

Secondly, the prime role of political ecology is also clear, which is concerned with the social and political dimensions of environmental issues, with a particular emphasis on power relations. When the different disciplines "environmentalised", they sought to detect and describe the entire set of objectifiable factors and subjective per-

ceptions that defined the environment and, as if it were a text, they have read and interpreted its politicised elements, both discursive and material.

Third, the influence from the geographic tradition is palpable. Chorological and spatial analyses are part and parcel of ecological and environmental analysis. Space, territory and place are the focal points, and more notably so is the study of the distribution and layout constants which are often interpreted in an economic and political vein, with a clear influence from the theories of location, human ecology and political ecology. The degrees of neutrality of places, locations, distributions and consumptions are evaluated, and to what extent the results reveal the affiliation and reaffiliation of a desired socio-spatial segregation and consequent unequal access which generates social conflicts is also analysed. In this way, there is a shared interest in interpreting the reproduction of the power relations which can be inferred from the spatial distribution of energies, materials, infrastructures and industries and from unequal access to natural resources.

Fourth, the influences of constructivism are clear. In all the fields, it is common to analyse the language and attempt to decode the discourses and concepts related to the environment, which are viewed as categories within complex systems subjected to joint processes and multiple dependent scales, such as of space, time, society, identity, gender, individual or chance. Thus, it is taken for granted that concepts like pollution, pollutant, naturalisation, water, air or food quality standards, erosion, natural disaster and environmental risk are shaped and constructed by these spatial, temporal, social or identity-based contexts, which, in turn, shape and build new ones, both discursive and material, contemporary or not.

Fifth, a common set of ideas can be detected in many of the studies which examine a current environmental challenge or one that existed when they were written, namely the creation of a practical tool that is capable of evaluating the present and proposing alternative models. Thus, when faced with a challenge, the objective is to identify, define, interpret, evaluate and propose.

Finally, the environmental history devoted to the Catalan environment obviously has to deal with conjectures stemming from the socioenvironmental setting itself and must bear in mind its own periodisations and common problems. In terms of the local periodisations, we can stress the climate stages (the warm Mediaeval episode between approximately the 8th and 14th centuries, the Little Ice Age between the 14th and 19th centuries, and anthropic-induced climate change since the 20th century); the specificities generated by the system of land access and property structures; and the major socio-metabolic stages (organic economies before the 18th century, organic economies in the agrarian sector and fossil fuels in industry and transport from the late 18th century until the mid-20th century, and the industrialisation of agriculture and livestock since the second half of the 20th century).

The common problems throughout the entire history have included the different climate adversities which have arisen, the scarcity and irregularity of water resources characteristic of the Mediterranean climate, the scarcity of agricultural land, and constraints arising from wars and the movements of armies. And for the more recent eras, they have included the conflicts inherent to urbanisation, waste management, tourism, conservation of biodiversity, natural park management, the introduction of genetically modified crops, production and consumption externalities and pollution arising from human activities (noise, visual, air or water), the use and extraction of minerals and fossil fuels, and the construction of power plants. Specifically from recent history, we should cite longstanding conflicts such as those stemming from the Ercros chemical complex in Flix (since 1897), the air pollution from the cement factory in Montcada i Reixac (since 1917), the salinization of the Llobregat River owing to the potash mines (since 1925) and the risk of pollution posed by the nuclear power plants in Vandellòs (since 1974), Cofrents and Ascó (since 1984). Among the conflicts existing right now,¹⁴ apart from those caused by global climate change, we can cite the Son Reus incinerator on Mallorca (since 1992), the expansion of La Punta port in Valencia (since 1993), nitrate pollution in the Ter River (since 2000), the diversion of the Ebro River based on the National Hydrological Plan (since 2001), the construction of the very high-tension line between France and Catalonia (since 2001) and in Lluçmajor (since 2010), the earthquakes associated with the Castor project in the Mediterranean Sea (since 2007) and the use of hydraulic fracturing to get hydrocarbons (since 2012).

THE ENVIRONMENTAL HISTORY OF URBANISATION AND INDUSTRIALISATION AND THE HISTORY OF POLLUTION

The environmental history of urbanisation and industrialisation, provided for by both ecological economy and urban political ecology,¹⁵ has established four strands of revision and approach: the interpretation of historical environmental discourses related to urban planning; the reconstruction of the social metabolism (of energy and material flows); the identification of the propelling forces and guiding agents that take part in shaping these flows (use of the distributions and locations of energies and materials as reproducers of power relations); and the evaluation of conflicts and the responses generated by politicised distributions and locations.

In terms of the discourses, hygiene proposals have been posited in relation to urban planning and green spaces,¹⁶ the proposals from anarchism related to natural laws and the urban metabolism¹⁷ and the design of landscapes meant for work or play.¹⁸ In terms of the reconstruction of the metabolism, maps of gas,¹⁹ electricity²⁰ and water²¹ have been drawn up in which the flows are interpreted as

the texts resulting from power representations, and as such, generators of social conflicts. In the historical perspective and for the urban sphere, conflictiveness²² has recently been studied in the case of potable water fountains in 17th-century Barcelona within a context of water stress during the Little Ice Age;²³ in the case of water cycles in the city of Barcelona from the 19th century until today within a context of demographic explosion and the privatisation of water;²⁴ and in current history in the case of territorial conflicts in the Valencia metropolitan area during the 2000s.²⁵ From the vantage point of the territory as a whole, studies have focused on topics like water flows within the Spanish Civil War,²⁶ along with the geopolitics of the electrical and wind system in Catalonia.²⁷ Finally, also worth noting is the impetus from geography to incorporate environmental history as a tool for urban planning, as Horacio Capel outlined in the specific case of the design of electrical energy flows at the *4th Symposium on Electrification*.²⁸

Likewise, studies of the history of pollution have examined four main points (which have much in common with studies on the environmental history of urbanisation and industrialisation): the interpretation of the discourses and grammars related to pollution; the politicisation of locations; the scope of pollution in terms of its environmental, socioeconomic and especially health impact; the scope of pollution in terms of concepts related to jurisprudence (such as environmental cost, social compensation, environmental responsibility, compensation measures and environmental restitution); and the examination of the conflict and mobilisation generated by pollution, with reference to the intensity of reactions, the groups involved, the forms of mobilisation and the social construction of risk.

Discursive analysis has evaluated the process of constructing and deconstructing concepts like the naturalisation, concealment or denial of the hazards of pollutants, quality standards or environmental toxins and food fraud. "Naturalisation", for example, was revisited in the case of the salinization of the Llobregat River by the potash mines since 1925, where the existence of natural geological salinity has been used to deny or minimise the anthropic pollution.²⁹ The dialectic between experts and individual or collective perceptions, as well as concealment, denial and the use of scepticism when assessing the hazard of pollutants, has been examined in the cases of the medical reports issued in the city of Barcelona in the 18th century which evaluated calico dyes and the use of coal;³⁰ in the case of the broad spectrum of factors involved in constructing environmental toxicity in the 19th and 20th centuries;³¹ and in the discourses related to the chemical plant in Flix³² and the different nuclear power plants.³³ Finally, the studies devoted to toxins and food fraud have led to an increase in the number of cases of adulteration detected since the 18th century, as well as to the definition of food quality standards.³⁴ Currently, the objective of two research projects framed within the 20th

century are to study the dialectic between experts' scientific knowledge and the public perception, in particular regarding the perceptions of risk and the deconstruction of concepts related to pollution and toxins.³⁵

The interpretation of spaces in relation to pollution has revealed the politicisation and lack of neutrality of locations, such as the Vandellòs I³⁶ nuclear power plant, as well as the waste storage in Ascó. It has also clearly revealed that location is closely tied to poverty in the region, which has also hindered the development of alternatives to overcome it.³⁷ The evaluation of the health impacts has been closely tied to the history of medicine and particularly to the field of public health in both mediaeval and modern contexts.³⁸ Finally, the study of the determination of responsibilities and the forms of mobilisation have been evaluated in the case of the nitrate pollution from liquid manure in the Ter River since the 1980s,³⁹ the chemical industry in Flix⁴⁰ and the nuclear power plants in Ascó, Vandellòs and Cofrents.⁴¹ On this point, we should note the importance of evaluations of the impacts of pollution and the determination of responsibilities for environmental justice movements,⁴² as well as for courts (since the instatement of ecological crimes in Spain in 1983).

AGROECOLOGY AND THE ENVIRONMENTAL HISTORY OF LANDSCAPES

One could claim that agroecological history has been the cornerstone of environmental studies in the Catalan-speaking lands. The specialisation in agrarian history – which gained ground in academia between 1960 and 1970 – revised the interpretation of agrarian growth from an environmental vantage point in the 1980s. The gatherings of experts in history and experts in agronomic engineering, biology, economics and geography organised by Ramon Garrabou and José Manuel Naredo were essential to undertaking this revision. The purpose of these gatherings was to equip historians with the methodological tools they needed to environmentally evaluate issues related to nutrient flows, water resources, technology and the historical dynamics that come into play in the formation of agrarian, wooded or natural landscapes.

Since the 1990s, different interdisciplinary and international research groups have undertaken studies of agrarian metabolism and landscapes from this perspective, adapting to the requirements of the theoretical frameworks and the avenues of research that have emerged. Thus, natural,⁴³ agricultural⁴⁴ and forested landscapes have been historically reconstructed – especially for the stages prior to the 19th century, from deforestation until the first third of the 20th century and reforestation from the mid-20th century until today. For prior to this period, the paucity of sources makes it difficult to determine both the surface features and the ways the land was used.⁴⁵

A common thread of the studies is the determination of the social and metabolic balances of the energy, nutrient and water flows; the evaluation of the changes in land use; and the analysis of social, metabolic and biophysical factors in unequal access to natural resources. Likewise, they have examined the coevolutionary relations among different spaces (agrarian, forest and natural; or urban and periurban)⁴⁶ and their relationship with land planning and biodiversity management during the periods when the studies were conducted.⁴⁷ The evaluations focusing on the landscape viewed as a metabolic system have encompassed all of Catalonia.⁴⁸

Within the sphere of research into agroecological history, we should cite the study conducted around traditional agricultural memory and organic economies. This is the memory that encompasses all the knowledge with the capacity to reproduce agro-systems within an organic, sustainable system which has been shaped both by theoretical texts and rural communities. The recovery and conservation of this traditional agro-memory has primarily been undertaken by the fields of philology and history on the one hand and ethnoecology on the other. Philology and history have transcribed, translated into Catalan if needed, edited and interpreted ancient, mediaeval and modern agricultural treatises,⁴⁹ texts which describe the traditional techniques that made it possible to get optimal yields from the agroecological flows of energy and materials, maintain the biodiversity of the landscape and allow pests, diseases or episodes of extreme weather to be combated. In ethnoecology, the recovery of memory has focused on the periods when the studies were conducted and stressed the relationship between the use of traditional techniques and conservation of the biodiversity.⁵⁰ These works as a whole are particularly tied to ecological agriculture, endowing them with content, while also including research devoted to degrowth, which is extremely important at research centres within the Catalan-speaking area, in particular the Institut de Ciència i Tecnologia Ambientals of the Universitat Autònoma de Barcelona, which advocates a decrease in the use of allergenic chemicals and neurotoxic, immunosuppressive and mutagenic pesticides within the framework of a gradual, democratically-controlled reduction in consumption and economic production.⁵¹

Finally, we should cite the projects devoted to reconstructing historical green spaces. These initiatives have a strong communicative aim and the goal of transforming historical theory into practice. One example is the recovery of the agricultural space of the Jardí de l'Amistat d'Isidre Nadal in Sabadell, undertaken as an example of an alternative urban model connected with the anarchic discourses of the first half of the 20th century.⁵² We should also cite the reconstructions of green spaces in convents, such as the garden of the Caputxins de Sarrià and the medicinal plant and vegetable garden of the monastery of Pedralbes. These projects seek to construct spaces for environmental education and research, experimen-

tation and evaluation of the role that traditional agriculture can play in the development of contemporary ecological agriculture.

HISTORICAL CLIMATOLOGY FROM THE ENVIRONMENTAL PERSPECTIVE

The Catalan-speaking lands have been solidly reconstructed and their climate described thanks to the longstanding historiographic tradition of historical climatology.⁵³ The environmental perspective injects coevolutionary considerations into the climate data and necessitates an interpretation of the subjectivities involved in the relationships between the individual and the climate. This kind of analysis is particularly unique in the Catalan-speaking lands because of both its richness and the high volume of documentation, which is instrumental after the 18th century, and qualitative or indirect proxy data before the 18th century (revolving around municipal, religious and private administrative sources, as well as account books and personal ledgers).

In order to establish the themes and flesh out the sources and methodologies in this field, the work undertaken by Mariano Barriendos for the first thesis read on historical climatology⁵⁴ in Catalonia was essential, as were the research projects by Armando Alberola (director of the “Grupo de Investigación en Historia y Clima” at the Universitat d’Alacant) and Miquel Grimalt (director of the “Grup de Recerca de Climatologia, Hidrologia, Riscs Naturals i Territori” at the Universitat de les Illes Balears). These studies, which are clearly influenced by considerations coming from systemic ecology and specifically from the social ecology of risk, have focused on precisely defining risk and natural disaster, and more concretely on decoding the concept of the social construction of risk.

The definition of natural disaster and the construction of risk have forced researchers to consider a broad gamut of closely interconnected factors, namely the description of the very exceptional nature of the natural phenomenon in terms of its singularity, variability or extreme manifestation;⁵⁵ the determination of the population’s exposure and vulnerability and to what extent vulnerable places are politicised;⁵⁶ the interpretation of psychological attitudes and responses when faced with a natural disaster;⁵⁷ the evaluation of the material and textual responses of the population and the authorities; the study of the tools used to manage risk – such as communication and the exchange of oral or written knowledge;⁵⁸ the evaluation of the adaptations, responses, the capacity for resilience or collapse;⁵⁹ and the delimitation of the scope of the impact on factors such as demographics, the economy, agricultural production⁶⁰ and health.⁶¹

The two periods examined in the greatest depth are the Little Ice Age and the climate change caused by the anthropogenic greenhouse effect. Without a doubt, from the standpoint of environmental history, the relations

which can be found between the two stages are clear in terms of their practical content. The analysis of the factors, agents and subjectivities which came into play during the Little Ice Age allow us to define and locate the possible contemporary risk zones, assess the degree of ecosystemic risk and consider how anthropic-induced climate change affects the risks that already existed (in relation to sea level, floods, droughts, agricultural and fishing models or the ageing of the population, among others). Furthermore, a historical survey also allows different communities’ responses to climate change to be evaluated, adopted and adapted, if needed. What is more, historical climate series have been and remain fundamental in developing official reports or written laws that seek to design the adaptation to contemporary climate change, as can be seen in the different documents emanating from the bodies and institutions in the Catalan-speaking lands that have addressed this issue.⁶² Finally, in terms of the specific study of contemporary climate change, since the emission of greenhouse gases is its cause, it shares methods, topics and objectives with the history of pollution. And thus, the historical interest in examining it, fundamentally through periodical documentation, also entails interpreting the discourses that legislate or describe it.⁶³

ENVIRONMENTAL THINKING

Since it is integrated within the very complex ecosystem where society and environment converge and it participates in the same joint processes, environmental history emerges from certain environmental perceptions; that is, it studies them while also creating them. For example, in the English-speaking world, the origin of the discipline is indebted to the ruminations of Patrick Geddes, Lewis Mumford and Rachel Carson, who drew attention to the need to undertake an ethical shift in the relationship between humans and nature. At the same time, perceptions are an important topic of analysis for environmental history. As mentioned above, it seeks to decode definitions, representations and worldviews on aspects related to pollutants, quality standards and climate disaster. It is also concerned with the notion of environment as a whole.

The history of science played a prime role in the global analyses of the concept of the environment because healthcare perspectives were included within the frameworks of environmentalist reasoning common to the Hippocratic tradition from the ancient world until the 19th century, and because of the importance of scientific thinking on the interpretation of nature.⁶⁴ Here we could cite the pioneering studies by Luis Urteaga, who analyses the environmental ideas of nature in the 18th century, with a particular emphasis on enlightened forestry laws.⁶⁵ In the same vein, attention must be paid to the discussions on the role of nature in the construction of identities. Studies have examined the concept of nature within

the context of education in modern states;⁶⁶ the social creation of landscapes based on Catalan geography in the period from 1870 to 1939;⁶⁷ the consideration of scientific studies on nature within the framework of the *Renaixença*;⁶⁸ the creation of archetypal landscapes in relation to nationalism;⁶⁹ and perceptions in contemporary contexts in relation to geographic thinking, environmentalism and land planning.⁷⁰

The research focusing on the context of the construction of the concept of nature during the American conquest and colonisation⁷¹ falls within the same vein and links up directly with one of the bodies of literature with the longest-standing tradition in the corpus of environmental history. These include the grievances regarding the status of the American indigenous people aired by Mary Austin and Angie Debo during the first half of the 20th century and the interpretations by Alfred W. Crosby, William Cronon and Richard Grove since the 1970s, who have not only used concepts like Columbian exchange, biological shock, biological conquest and ecological imperialism to rewrite the history of the conquests and colonisations, but also undertaken the study, criticism and struggle against contemporary biological conquests, as embodied in mining policies, which serve as an underpinning for fields like ecological economics, political ecology and environmental justice movements.

This connection between past and present is one of the most fascinating aspects of environmental history in that it evinces the ability to create individual or collective consciousnesses. The rewriting of historical events and the updating of the historiography questions traditional views of themes like the Industrial Revolution, social struggles and conquests and colonisations, and by doing so it can create a bank of memory of injustices and unmask those that had been concealed.

By avoiding the extreme conceptions of constructivism, environment and environmental history – as an integral part of society – can be regarded as coevolving discursively and materially, constructing concepts and realities.

As proclaimed by the theoretical formulations around the concept of post-normal science, in contemporary contexts – which are extraordinarily complex and full of uncertainties and risks – the decisions to be taken when faced with socioenvironmental crises, either local or global, will be imperfect if we rely solely on science and technology. Just as conflicts reflect and depend on multiple causes, dimensions and scales, so analyses and evaluations must also be multiple and bring together different theories – science, history, politics, sociology, economics, ethics and anthropology – and consider the participation of different agents – from social movements to the subjects directly affected by environmental problems. The solutions to the problems must also be tackled from this plural perspective.

However, what material solutions do historical considerations allow? The reconstructions of energy and mate-

rial flows and the identification of the forces and agents that construct them enable us to design urban plans that minimise the food, energy and water imprint of urban areas; reconstructions of agrarian flows enable us to find alternatives to the crisis of industrial agricultures and find fairer and more sustainable production and consumption systems; understanding the dynamic of landscapes enables us to ascertain their ability to host biodiversity and can guide land planning programmes or the management of natural spaces; knowing the effects of externalities enables us to design industrial strategies that minimise environmental impacts; knowing the scope of pollution enables us to establish compensation or determine responsibilities, undertake the relevant judicial actions and enforce compliance with the laws; and establishing climate cycles enables us to make data projections and predict climate risks on a centuries-long scale.

To make environmental history truly effective, it must be capable of forging a solid, coherent and effective communicative circuit based on tension and interaction which is necessarily not one-way. Expert knowledge should coevolve with the agents involved with environmental problems, with the subjects affected, with citizens, with the political parties and with public institutions. And connectors are needed for this communicative circuit to work. For this reason, it is important for experts to participate not only in scholarly journals but also in activist magazines, and for them to work with social movements, civil-society organisations and public institutions. One theoretical-practical analysis in this vein is the work of Josep Lobera, who uses technoscience, sociology and environmental history to evaluate the ideas of sustainability and environmental conflicts in relation to citizen participation and teaching-learning processes.⁷²

Without a doubt, one task still pending is to evaluate the solidity of the connectors in the communicative circuit which join environmental history with the discipline of history itself – to what extent it brings about a historiographic revision or manages to become inserted within the traditional historical discourse – or which link it with the political debates, territorial policies or environmental laws. To ensure the very survival of environmental history, perhaps we must ascertain its capacity to impact contemporary conflicts and communicate with the agents involved in them. After all, the ultimate goal of environmental history should be to rejoin the metabolic circuit and propose more socially and environmentally sustainable alternatives.

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- [4] *Recerques*, 26 (1992), pp. 1-68.
- [5] Joan MARTÍNEZ ALIER. *De la economía ecológica al ecologismo popular*. Icaria Editorial, Barcelona 1994.
- [6] The following publications emerged from the gatherings: Ramon GARRABOU; José Manuel NAREDO (eds.). *La fertilización en los sistemas agrarios. Una Perspectiva Histórica*. Fundación Argentaria, Madrid 1996; Ramon GARRABOU, José Manuel NAREDO (eds.). *El agua en los sistemas agrarios. Una perspectiva histórica*. Fundación Argentaria, Madrid 1999; Ramon GARRABOU, José Manuel NAREDO (eds.). *El paisaje en perspectiva histórica: Formación y transformación del paisaje en el mundo mediterráneo*. Universidad de Zaragoza, Zaragoza 2008.
- [7] Mariano BARRIENDOS VALLVÉ. *Climatología histórica de Catalunya. Aproximación a sus características generales (ss. XV-XIX)*. Doctoral thesis. Universitat de Barcelona, Barcelona 1994.
- [8] Between 1997 and 2006, Ramon Garrabou oversaw three research projects devoted to agroecological history. The first was: “Factores determinantes del desarrollo agrario en Cataluña: recursos naturales, organización del trabajo y cambio técnico”. From 1997 until today, Enric Tello Aragay has overseen seven. The first was: “Recursos naturales, organización del trabajo agrario y cambio tecnológico”. From 2002 until today, Armando Alberola Romá has overseen five projects devoted to climate and environmental history. The first was: “Clima, economía y sociedad en la España del siglo XVIII”. And the first project overseen by Rosa Congost with an environmental topic was: “Estudio integrado del cambio socioambiental en la Franja costera: paisajes históricos del litoral del Empordà y el Baix Llobregat”. Universitat Pompeu Fabra, 2002-3. On the other hand, in 2002, as part of the *Seminari d’Estudis i Recerques Prehistòriques*, the “Xarxa Temàtica d’Història Ambiental i Paisatges Culturals” was launched, directed by Santiago Riera Mora and Ramón Julià Brugués, which is devoted to the historical study of land uses. It has continued in the projects “Ter-AmAr”, “Paleo Bàrcino” and “Paleopaisatges nadius d’Arizona: la vall del Río Verde”.
- [9] Maria de BOLOS. “Aproximación al estudio del hombre como elemento y factor del paisaje”. *Actas del V Coloquio de Geografía*. Universidad de Granada, Granada 1977, pp. 161-168; Josep M. PANAREDA. *L’estructura i la dinàmica del paisatge actual al Montseny: els impactes humans sobre els sistemes naturals*. Doctoral thesis. Universitat de Barcelona, Barcelona 1978; Joan SABÍ I BONASTRE. *L’estudi agro-ecològic i l’evolució històrica recent del paisatge: el cas d’un sector occidental de la comarca del Bages*. Doctoral thesis. Universitat de Barcelona, Barcelona 1982.
- [10] Joan MARTÍNEZ ALIER. *L’ecologisme i l’economia: història d’unes relacions amagades*. Edicions 62, Barcelona 1984; Luis URTEAGA. “La economía ecológica de Martínez Alier”. *Documents d’anàlisi geogràfica*, 7 (1985), pp. 193-205.
- [11] In addition to the proposals from the congress in Girona and the monographic issue of the journal *Recerques*, the syntheses and methodological proposals that have been made during these years include: Martí BOADA. “Història ambiental. Una nova història.” *Jornades l’Home i el Medi a la Conca de Barberà i les Muntanyes de Prades*. Centre d’Història Natural de la Conca de Barberà, Montblanc 1996, pp. 1-30; Martí BOADA, David SAURÍ. *El cambio global*. Editorial Rubes, Barcelona 2002; Agustí NIETO-GALAN. *Cultura industrial, historia y medioambiente*. Rubes, Barcelona 2004; Enric TELLO. *La historia cuenta. Del crecimiento económico al desarrollo humano sostenible*. Fundació Nous Horitzons-El Viejo Topo, Barcelona 2005. Among the latest methodological proposals, worth noting is the working meeting devoted to the history of science in relation to environmental history entitled “At the Intersection of Disciplines: History of Science and Environmental History”, which was held in June 2017 and organised by the Centre d’Estudis d’Història de la Ciència at the Universitat Autònoma de Barcelona.
- [12] Georgescu-Roegen. *The Entropy Law and the Economic Process*. Harvard University Press, Cambridge, Massachusetts 1971.
- [13] Mario GIAMPIETRO, Kozo MAYUMI, Jesús RAMOS-MARTÍN. “Anàlisi integrada a gran escala del metabolisme i de l’ecosistema (MuSIASEM)”. *Energia*, 34.3 (2009), pp. 313-322.
- [14] For a snapshot of the state of environmental conflicts worldwide, see the interactive resource: *Atlas de la Justicia ambiental*. This is an international project coordinated by the Institut de Ciència i Tecnologia Ambiental of the Universitat Autònoma de Barcelona and directed by Joan Martínez Alier <<http://ejatlas.org/>> [Retrieved on 25 January 2018]
- [15] For a snapshot of the state of urban political ecology, see: Rubén Alejandro VILLAR NAVASCUÉS. “La ecología política urbana: veinte años de crítica, autocrítica y ampliación de fronteras en el estudio del metabolismo urbano”. *Documents d’Anàlisi Geogràfica*, 63 (2017), pp. 173-204.
- [16] Gerard JORI. “Salud pública e higiene urbana en la España durante el siglo XVIII. Una perspectiva geográfica”. Doctoral thesis. Universitat de Barcelona, Barcelona 2012; Carles GARCÍA. “Los parques urbanos del siglo XIX en Montreal y Barcelona”. In: *El desarrollo urbano de Montreal y Barcelona en la época contemporánea: un estudio comparativo*. Ed. Horacio Capel. Universitat de Barcelona, Barcelona 1998.
- [17] Eduard MASJUAN BRACONS. *La ecología humana en el anarquismo ibérico: urbanismo “orgánico” o ecológico,*

- neomalthusianismo y naturismo social*. Icaria Editorial, Barcelona 2000. Here we can stress the interconnection of this avenue of research with associationism and anthropology, which can be clearly seen in the debate series held in 2009 by the *Collectiu per a la Recerca Social i Autònoma COPSAT* entitled *Ciclo de Debates sobre Nuevos y Viejos Derechos Sociales. Ciclo III – ¿Derecho a la ciudad-campo?*. Eduard Masjuan participated in the series with a lecture entitled “Urbanisme ecològic i defensa del territori del passat a l’actualitat: de Cebrià de Montoliu i l’anarquisme ibèric a les alternatives presents”.
- [18] Jordi GRANÉ CASELLAS, Pere CASAS TRABAL. “Els jardins de la industrialització: un exemple de colonització simbòlica del territori”. *Revista d’etnologia de Catalunya*, 39 (2014): 183-189; Roger SAUQUET LLONCH. “La ciutat de repòs i vacances del Gatcpac (1931-1938). Un paisatge pel descans.” Doctoral thesis. Universitat Politècnica de Catalunya. Departament de Projectes Arquitectònics Sant Cugat del Vallès, Barcelona 2012.
- [19] Mercedes ARROYO HUGUET. *La industria del gas en Barcelona, 1841-1933: innovación tecnológica, territorio urbano y conflicto de intereses*. Ediciones del Serbal, Barcelona 1996; Mercedes ARROYO HUGUET. “Los cambios en el proceso de producción y de distribución de gas en Barcelona y su hinterland (1930-1969). Entre el gas de hulla y el gas natural.” *Scripta Nova: revista electrónica de geografía y ciencias sociales*, 218 (2006) <http://www.ub.es/geocrit/sn/sn-218-29.htm> [Retrieved on 25 January 2018]
- [20] Here we highlight all the literature contributed by all four international symposia organised since 2012 by *GeoCrítica* and devoted to electrification: <<http://www.ub.edu/geocrit/actassi.htm>>, <<http://www.ub.edu/geocrit/IIISimp-Eletr-SaoPaulo/IIISimp-eletr-portada.htm>>, <<http://www.ub.edu/geocrit/iii-mexico/iii-simposio-portada1.html>> and <<http://www.ub.edu/geocrit/Electr-y-territorio/Electr-y-territorio-Portada.htm>> [Retrieved on 25 January 2018].
- [21] Enric TELLO, Joan Ramon OSTOS. “Water consumption in Barcelona and its regional environmental imprint: A long-term history (1717–2008)”. *Regional Environmental Change*, 12.2 (2012), pp. 347-361 (Enric Tello is a member of the “Fundació Nova Cultura de l’Aigua” and has coordinated the technical commission on savings and efficiency of the Agència Catalana de l’Aigua (ACA)); Jordi GALOFRE. “La problemàtica de l’aigua potable a Banyoles a la primera meitat del segle XX”. *Estudis d’història agrària*, 23 (2010), pp. 209-218.
- [22] One of the pioneering works in interpreting territorial conflictiveness for contemporary cases is: Oriol NELLO, *Aquí no!: Els conflictes territorials a Catalunya*. Empúries, Barcelona 2003.
- [23] Xavier CAZENEUVE, Santiago GOROSTIZA, Maria Antònia MARTÍ ESCAYOL. *El llibre de les fonts de Barcelona de Francesc Sociés* (at press).
- [24] Eduard MASJUAN. “Conflicts and struggles over urban water cycles: The case of Barcelona 1880–2004”. *Tijdschrift voor economische en sociale geografie*, 99.4 (2008), pp. 426-439. David SAURÍ, Hug MARCH, Santiago GOROSTIZA. “Des ressources conventionnelles aux ressources non conventionnelles: l’approvisionnement moderne en eau de la ville de Barcelone”. *Flux*, 97-98 (2014), pp. 101-109.
- [25] Luis DEL ROMERO RENAU. “Geografía dels conflictes territorials a València i la seua àrea metropolitana”. *Documents d’anàlisi geogràfica*, 61.2 (2015), pp. 369-391.
- [26] Santiago GOROSTIZA, Hug MARCH, David SAURÍ. “Serving customers in revolutionary times: The experience of the collectivized Barcelona Water Company during the Spanish Civil War”. *Antipode*, 45.4 (2013), pp. 908-925.
- [27] Mercedes ARROYO. “De las ‘Fábricas de luz’ a la creación de un sistema. La organización regional de Fuerzas Hidroeléctricas del Segre, 1920-1952.” In: *Simposio Internacional Globalización, innovación y construcción de redes técnicas urbanas en América y Europa*. Universitat de Barcelona, Barcelona, Barcelona 2012, pp. 23-26; Sergi SALADIÉ GIL. “Els conflictes territorials del sistema elèctric a Catalunya”. *Treballs de la Societat Catalana de Geografia*, 71-2 (2011), pp. 201-221; Sergi SALADIÉ GIL. “Geopolítica de la implantación eólica en Catalunya” In: *Geografía y desafíos territoriales en el siglo XXI*. Ed. Vicente GOZÁLVEZ. Asociación de Geógrafos Españoles, Alicante 2011, pp. 425-436.
- [28] Horacio CAPEL. “Introducción”. *La electrificación y el territorio. Historia y futuro 2017* <<http://www.ub.edu/geocrit/Electr-y-territorio/Indice-Electr-y-territorio.htm>> [Retrieved on 25 January 2018]. Along the same lines, worth noting is also the efforts of the Grup de Geògrafs per a l’Ecologia Social (2GES) and the Grup d’Anàlisi i Planificació Territorial i Ambiental (Department of Geography, History and Art History, Universitat de Girona). See: M. Àngels ALIÓ TORRES, Gerard JORI GARCÍA. “La recerca universitària sobre la reforma ambiental urbana. Experiències des de l’ecologia social.” *Biblioteca 3w: revista bibliogràfica de geografía y ciencias sociales*, 2010 <<http://www.ub.es/geocrit/b3w-887/b3w-887-1.htm>> [Retrieved on 25 January 2018].
- [29] Santiago GOROSTIZA. “Potash Extraction and Historical Environmental Conflict in the Bages Region (Spain)”. *Investigaciones Geográficas*, 61 (2014), pp. 5-16; Santiago GOROSTIZA, Jordi HONEY-ROSÉS, Roger LLORET. *Rius de Sal. Una visió històrica de la salinització dels rius Llobregat i Cardener durant el segle XX*. Edicions del Llobregat, Barcelona 2015; Santiago GOROSTIZA, David SAURÍ. “Dangerous assemblages: Salts, trihalomethanes and endocrine disruptors in the water palimpsest of the Llobregat River, Catalonia”. *Geoforum*, 81 (2017), pp. 153-162;
- [30] Maria Antònia MARTÍ ESCAYOL. “Indústria, medicina i química a la Barcelona de finals del segle XVIII: el tintatge i la introducció del carbó mineral des d’una perspectiva ambiental”. *Recerques*, 44 (2002), pp. 5-20.
- [31] José Ramón BERTOMEU-SÁNCHEZ, Ximo GUILLEM-LLOBAT. “Following Poisons in Society and Culture (1800-

- 2000): A Review of Current Literature”. *Actes d’Història de la Ciència i de la Tècnica*, 9 (2016), pp. 9-36.
- [32] Marta PUJADAS I GARRIGA. *La creació d’un passiu ambiental a Catalunya. Història de la planta química de Flix al riu Ebre (1897-2013)*. Doctoral thesis. Universitat Autònoma de Barcelona, Bellaterra 2015.
- [33] Luis SÁNCHEZ-VÁZQUEZ. *La legitimización de la energía nuclear en España: el fórum atómico español (1962-1979)*. Doctoral thesis. Universitat de Granada, Granada 2010. Evelio GÓMEZ, Sergi SALADIÉ, Xavier ROQUÉ. “Átoms a la plaça: conflictes ambientals i energia nuclear, 1977-2017”. *Ciència, tecnologia i medicina a les places: governabilitats, apoderaments i resistències*, Organisers: Jaume VALENTINES ÀLVAREZ, Jaume SASTRE JUAN. Institut d’Estudis Catalans. Round table held in Barcelona on 11 January 2017.
- [34] Judit Vidal BONAVILA. “La problemàtica de l’aiguarent a Reus en els segles XVII-XVIII: la contaminació de les aigües i els frauds”. *Estudis d’història agrària*, 26 (2014), pp. 151-164; Ximo GUILLEM LLOBAT. “Losing the global view in the establishment of new limits to food quality. The regulation of the food market in Spain (1880–1936)”. *Food and History*, 6.1 (2008), pp. 215-46; Esteban CANALES GILI, Angeles CARBAJAL AZCONA. “La adulteración de alimentos en Gran Bretaña, 1820-1850”. *Trienio: Ilustración y liberalismo*, 55 (2010), pp. 131-176; Ximo GUILLEM-LLOBAT. “The sugar industry, political authorities, and scientific institutions in the regulation of saccharin: Valencia (1888–1939)”. *Annals of Science*, 68.3 (2011), pp. 401-424.
- [35] “España “Tóxica”: Industria, ley, activisme y expertos en el siglo XX” (2015), with Agustí Nieto Galan as the lead researcher; and “Living in a toxic world: Experts, regulations and public controversies in 20th-Century Spain” (2015), with Jose Ramon Bertomeu Sánchez as the lead researcher.
- [36] Ana ROMERO DE PABLOS. “Energía nuclear e industria en la España de mediados del siglo XX. Zorita, Santa María de Garoña y Vandellòs” In: *La Física en la Dictadura. Físicos, Cultura y Poder en España 1939–1975*. Ed. Néstor HARRAN, Xavier ROQUÉ. Servei de Publicacions de la Universitat Autònoma de Barcelona, Bellaterra 2012, pp. 45-63. Luis SÁNCHEZ-VÁZQUEZ, Alfredo MENÉNDEZ-NAVARRO. “Nuclear Energy in the Public Sphere: Anti-Nuclear Movements vs. Industrial Lobbies in Spain (1962–1979)”. *Minerva*, 53.1 (2015), pp. 69-88.
- [37] Sara MAESTRE ANDRÉS. “El problema pendiente de los residuos nucleares: estudio del conflicto del almacén temporal centralizado en Ascó (Catalunya, Estado Español)”. *Revibec: revista iberoamericana de economía ecológica*, 27 (2017), pp. 17-35.
- [38] Maria BARCELÓ CRESPI. “Alguns aspectes sobre contaminació, neteja i salubritat a la ciutat de Mallorca baixmedieval” In: *El món urbà a la Corona d’Aragó del 1137 als decrets de Nova Planta: XVII Congrés d’Història de la Corona d’Aragó= Congreso de Historia de la Corona de Aragón: Barcelona. Poblet. Lleida, 7 al 12 de desembre de 2000:[actes]*. Universitat de Barcelona, Barcelona 2003. pp. 25-34; Antonio CONTRERAS MAS. “Contaminación por cinabrio en Ciutat de Mallorca (1347)”. *Bolletí de la Societat Arqueològica Lulliana: Revista d’estudis històrics*, 67 (2011), pp. 125-136; Josep Lluís BARONA. “Política urbanística i higiene de les ciutats. La societat Valenciana en el trànsit al segle XX”. *Gimbernat: revista catalana d’història de la medicina i de la ciència*, 38 (2002), pp. 223-238; Emili HUGET I RAMIA. “Evolució històrica de la contaminació del riu Llobregat”. *Gimbernat: revista catalana d’història de la medicina i de la ciència*, 54 (2010), pp. 197-206.
- [39] David SAURÍ, Hug MARCH. “Can’t go to the fountain no more. Pigs, nitrates and spring water pollution in Catalonia” In: *Political Ecologies of Meat*. Ed. Jody EMEL and Harvey NEO. Routledge, New York 2015, pp. 109-126.
- [40] Joaquim SEMPÈRE, Mercedes MARTÍNEZ IGLESIAS, Ernest GARCIA. “Ciencia, movimientos ciudadanos y conflictos socioecológicos”. *Cuadernos Bakeaz*, 79 (2007), pp. 1-19.
- [41] Vicente CASALS COSTA. “Energía nuclear y movimientos sociales en Cataluña durante la Transición política, 1975-1982”. In: *Cuarto Simposio Internacional sobre Historia de la Electrificación. La electrificación y el territorio. Historia y futuro*. Ed. Miriam H. ZAAR, Magno VASCONCELOS P. JUNIOR, Horacio CAPEL. Universidad de Barcelona, Barcelona 2017; Joaquim SEMPÈRE, Mercedes MARTÍNEZ IGLESIAS, Ernest GARCÍA. “La problemàtica de la energia nuclear en el Valle de Ayora: Los conflictos en torno a la prolongación del funcionamiento de la central de Cofrentes y a la candidatura de Zarra como posible ubicación del almacén temporal centralizado de residuos de alta actividad”. *Arxius de sociologia*, 25 (2011), pp. 83-102.
- [42] Joan MARTÍNEZ ALIER. “Ecología política del extractivismo y justicia socioambiental.” *INTERdisciplina*, 3.7 (2015) <<http://dx.doi.org/10.22201/ceiich.24485705e.2015.7.52384>> [Retrieved on 25 January 2018].
- [43] Maria BARRACHINA. “The effects of land use change on landscape: The case of Vall Fosca (Catalan Pyrenees)”. *Man in the Landscape Across Frontiers –IGU-LUCC Central Europe Conference, Prague 2007*; Judit GIL FARRERO. *Ciència i medi ambient a Catalunya. La gestió del Parc Natural de la Zona Volcànica de la Garrotxa (1975-1982)*. Master’s Degree Final Project. Universitat Autònoma de Barcelona, Bellaterra 2011.
- [44] Enric TELLO. “La petjada ecològica del metabolisme social: una proposta metodològica per analitzar el paisatge com a humanització del territori”. *Manuscrits*, 22 (2004), pp. 59-82; Enric TELLO, Ramon GARRABOU. “La evolución histórica de los paisajes mediterráneos: algunos ejemplos y propuestas para su estudio.” *Territorios, paisajes y lugares trabajos recientes de pensamiento geográfico*. Ed. Valerià PAÜL I CARRIL, Joan TORT I DONADA. Galerada-Asociación de Geógrafos Españoles, Barcelona 2006, pp. 19-64.

- [45] Jose Ignacio JIMÉNEZ BLANCO. "El monte: una atalaya de la Historia". *Historia agraria: Revista de agricultura e historia rural*, 26 (2002), pp. 141-190; Jordi BOLÒS MASCLANS. *Els orígens medievals del paisatge català: l'arqueologia del paisatge com a font per a conèixer la història de Catalunya*. Vol. 64. Institut d'Estudis Catalans, Barcelona 2004; Teresa CERVERA, Ramon GARRABOU, Enric TELLO. "Política forestal y evolución de los bosques en Cataluña desde el siglo xix hasta la actualidad". *Investigaciones de Historia Económica-Economic History Research*, 11.2 (2015), pp. 116-127.
- [46] Josep Vila Subirós. "El paper dels espais agraris en la conservació del patrimoni natural" In: *Percepcions de l'espai agrari periurbà*. Eds. Anna ROCA TORRENT, Cristina TOUS DE SOUSA. Fundació Agroterritori, Barcelona 2013. <http://www.agroterritori.org/ficha.php?id_nivell3=95#doc589> [Retrieved on 25 January 2018]
- [47] Here we can highlight the "Grup de Recerca Conservació, Biodiversitat i Canvi Global, *Nycticorax*", directed by Martí Boada, at the Institut de Ciència i Tecnologia Ambientals of the Universitat Autònoma de Barcelona.
- [48] In this sense, worth noting is the project concerned with analysing the landscapes of Catalonia and Mallorca: "¿Sistemas agraris sostenibles? Una interpretació històrica de l'agricultura a Espanya des de la perspectiva biofísica", which is part of the international project: "Sistemas agraris sostenibles: el metabolisme socioecològic de l'agricultura occidental en perspectiva històrica." Among the latest studies devoted to environmental study of the landscape in Catalonia, we should highlight: Sònia SÀNCHEZ MATEO. *Anàlisi socioecològica a la vall de Santa Fe (massís del Montseny). La transformació del paisatge a través de la història ambiental*. Universitat Autònoma de Barcelona, Bellaterra 2010; Rosa CONGOST; Enric SAGUER. "Beyond life cycle and inheritance strategies: The rise of a middling social group in an Ancien Régime society (Catalonia, eighteenth Century)". *Journal of Social History*, 49:3 (2015), pp. 617-646; Elena GALÁN (et al.) "Widening the analysis of Energy Return on Investment (EROI) in agro-ecosystems: Socio-ecological transitions to industrialized farm systems (the Vallès County, Catalonia, c. 1860 and 1999)." *Ecological Modelling*, 336 (2016), pp. 13-25. For Mallorca, we can highlight: Gabriel JOVER; Ricard SOTO. "Colonización feudal y organización del territorio. Mallorca, 1230-1350". *Revista de Historia Económica-Journal of Iberian and Latin American Economic History*, 20.3 (2002), pp. 439-477; Gabriel Jover AVELLÀ, Ricard SOTO. "De la agricultura andalusí a la feudal: ¿Una ruptura agroecológica? (Mallorca, 1230-1350)" In: *La construcción histórica del paisaje agrario en España y Cuba*. Los Libros de Catarata, Madrid 2003, pp. 25-52; Joan MARUL, Carme FONT, Enric TELLO, Nofre FULLANA, Elena DOMENE, Manel PONS, Elena GALAN. "Towards an energy-landscape integrated analysis? Exploring the links between socio-metabolic disturbance and landscape ecology performance (Mallorca, Spain, 1956-2011)". *Landscape Ecology*, 31.2 (2016), pp. 317-336. For Valencia, we can highlight the pioneering work of Thomas F. GLICK. *Irrigation and Society in Medieval Valencia*, Harvard University Press, Cambridge 1970; and the more recent: Antoni FURIÓ. "La domesticación del medio natural: agricultura, ecología y economía en el País Valenciano en la Baja Edad Media" In: *El medio natural en la España medieval: actas del I Congreso sobre ecohistoria e historia medieval*. Ed. Julián CLEMENTE RAMOS. Servicio de Publicaciones Universidad de Extremadura, Cáceres 2001, pp. 57-103; Carles SANCHIS IBOR. *Regadiu i canvi ambiental a l'Albufera de València*. Universitat de València, Valencia 2001; Pablo GIMÉNEZ FONT. *Las transformaciones del paisaje valenciano en el siglo XVIII*. Institució Alfons el Magnànim, Valencia 2007; Josep Rafael PÉREZ BORREDÀ. *Construyendo paisajes mediterráneos: Apropiación de tierras y transformación del paisaje en la Sierra de Enguera (1580-1930)*. Universitat de València, Valencia 2010.
- [49] Xavier LUNA-BATLLE. "Els 'Secrets d'agricultura' (1617) de Miquel Agustí en el context dels llibres agrònomicos europeus". *Manuscrits. Revista d'història moderna*, 33 (2016), pp. 17-32; Thomas M. CAPUANO. "Medieval Agricultural Lore in the Untitled Miscellany of MS. 6437, Biblioteca Municipal de València (Fons Serrano Morales)". *Catalan Review*, 23 (2009), pp. 9-16; Maria Antònia MARTÍ ESCAYOL. "Two Iberian versions of Gottfried of Franconia's Pelzbuch. Translations and copies in medieval and modern agricultural literature." *Sudhoffs Archiv*, 95.2 (2011), pp. 129-157.
- [50] Montse PARADA, Esperança CARRIÓ, Maria Àngels BONET, Joan VALLÈS. "Ethnobotany of the Alt Empordà region (Catalonia, Iberian Peninsula): Plants used in human traditional medicine". *Journal of Ethnopharmacology*, 124 (2009), pp. 609-618; Laura CALVET-MIR, Maria CALVET-MIR, Victoria REYES-GARCÍA. "Traditional ecological knowledge and land races in situ conservation in high mountain home gardens of Vall Fosca, Catalan Pyrenees, Iberian Peninsula" In: *Tradiciones y transformaciones en etnobotánica*. Ed. María Lelia POCHETTINO, Ana H. LADIO, Patricia M. ARENAS. CYTED - Programa Iberoamericano Ciencia y Tecnología para el Desarrollo, San Salvador de Jujuy 2010, pp. 457-464; Montse PARADA, Esperança CARRIÓ, Maria Àngels BONET, Joan VALLÈS. "Ethnobotany of the Alt Empordà region (Catalonia, Iberian Peninsula). Plants used for food purposes". *Journal of Applied Botany and Food Quality*, 84 (2011) pp. 11-25; Laura CALVET-MIR, Erik GÓMEZ-BAGGETHUN, Victoria REYES-GARCÍA. "Beyond food production: Ecosystem services provided by home gardens. A case study in Vall Fosca, Catalan Pyrenees, Northeastern Spain." *Ecological Economics*, 74 (2012), pp. 153-160; Carles RIU-BOSOMS, Laura CALVET-MIR, Victoria REYES-GARCÍA. "Factors enhancing land race in situ conservation in home gardens and fields in Vall de Gósol, Catalan Pyrenees, Iberian Peninsula". *Journal of Ethnobiology*, 34.2 (2014), pp. 175-194.

- [51] Giacomo D'ALISA, Federico DEMARIA, Giorgos KALLIS. *Degrowth. A Vocabulary for a New Era*. Routledge, New York, London 2014.
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