Ladurie nlr MIKE DAVIS

TAKING THE TEMPERATURE OF HISTORY

Le Roy Ladurie's Adventures in the Little Ice Age

Emmanuel Le Roy Ladurie has long been a contrarian—or as he prefers to call himself, a free electron—in a culture whose mandarins sheathe themselves in seamless ideological armour. Many of them, of course, enter public life from the left but exit from the right, in which case their conversion obligates a comprehensive reversal of previous convictions in order to become the mirror opposite. This was well illustrated in the case of Le Roy Ladurie's friend François Furet, a former Communist, who after rejecting the political left, declared war against 'Stalino-Marxist historicism' in all of its guises, including even the *Annales* school, which he denounced as 'merely a Gallic substitute for Marxism'. [1] Le Roy Ladurie, in contrast, is a chimera: quasi-reactionary in politics and semi-Marxist in methodology. He describes himself as a 'not very progressive Catholic', contributes to *Le Figaro* and calls May 1968 a 'disaster', yet stubbornly espouses the most unfashionable paradigm on the Seine, historical materialism. [2] He lionizes Tocqueville, whom he calls the John Wayne of French liberalism, but claims that Marxism, as a theory of the economic infrastructure, is 'totally complementary' to *la pensée Tocquevillienne* as a theory of the political superstructure. [3]

In his life he has been a privileged child of Vichy, a fierce young cadre in the ranks of the PCF, a founder of the new-leftish Party of Socialist Unity, a cultural celebrity supporting the centre right, and now an old sage who refuses to sum up his beliefs for the convenience of posterity. Likewise his scholarly work, ever-changing but somehow staying within a coherent domain, has always confounded simple categorization. With the possible exception of Régis Debray, Le Roy Ladurie is as close as a French intellectual comes to being an incompressible algorithm. His bibliography, for instance, includes articles or book chapters on such subjects as the radio-isotope dating of silver coins, symbolic castration, the outsourcing of breastfeeding in the eighteenth century, Brazilian gold, provincial costumes, epidemiology, the geography of place-names beginning with 'Saint' (hagiotoponyms), salt taxes, the history of the book, abandoned villages, Vauban's ideas for tax reform, tree rings, folk tales about fatal donkey farts, the height of military conscripts, witchcraft and France's regional identities.

1. SURVEYING THE COSMOS

But this joyous eclecticism, which recapitulates the creative spectrum of the *Annales* tradition in a single curriculum vitae, is for the most part gravitationally bound to the *grands projets* upon which he has worked for more than half a century: a 'total history' of the French countryside under the *ancien régime* and, arising from this, the history of the west European climate since the fourteenth century. [4] Over the decades, each project has evolved through innumerable case studies and interdisciplinary collaborations, yielding multiple volumes in various revisions and dozens of articles, all within a unique French system of team research in the humanities. Although seldom acknowledged by his reviewers and critics, Le Roy Ladurie from the beginning framed his investigations as 'ecological' or 'environmental' histories, making him a pioneer of the discipline. Similarly he was in the vanguard of the new historical demography and has often complained about the inattention of other historians to crucial issues of epidemiology, nutrition, contraception and fertility. If Braudel's comparative sweep was broader—a unified geohistory encompassing both the Christian and Islamic Mediterraneans—Le Roy Ladurie's work has been more epistemologically radical, despite—or, perhaps, because of—its narrower focus on

rural France, especially the Midi. In refusing to amputate social from natural history in his *The Peasants of Languedoc*, he took the totalizing vision of the second-generation *Annales* school to its highest stage of development, where climate change, disease evolution and sexual repression became historical forces interacting with and overdetermining class and religious conflicts. In an interview he once likened himself to a mangrove—with countless interests branching in every direction, but all growing from the same massive tree. [5] The image is apt.

Telescope and microscope

Because of a curious and incurable penchant for putting himself in harm's way with ambiguous formulations and hyperbolic slogans that don't accurately reflect their actual context, he has also been more misrepresented by selective quotation and spurious stereotype than any other major figure in the *Annales* camp. Indeed he seems to take an almost prankish delight in challenging his critics and interpreters to fit his awkward frame into their favourite procrustean bed. As his *Annales* colleague Jacques Le Goff once told an interviewer: 'Emmanuel enjoys that sort of thing—a play on words, a provocation.' [6] It usually works. In the 1980s, for example, Lynn Hunt cited Le Roy Ladurie's alleged shift in interest during the previous decade from quantitative history to anthropologized micro-histories and *mentalités* as dramatic evidence of the 'disintegration of the belief in a coherently unified interdisciplinarity' that had been the cornerstone of the *Annales* school. [7] She was referring, of course, to his studies of the 'existential past': *Montaillou, village occitan* (1975), the best-selling biography of a fourteenth-century Cathar village in the Pyrenees, and *Le Carnaval de Romans* (1980), a complex account of a sixteenth-century massacre. In Hunt's view these books signalled a turning away from the social-scientific framework—demographic and economic—of *Les paysans de Languedoc* (1966).

But any 'epistemic break' in Le Roy Ladurie's work during the 1970s is an illusion. If he now used a microscope to study small historical milieus, Hunt was wrong to suggest that he had, in turn, thrown away his old telescope. [8] In the 1970s he also wrote a major macro work, 'Les masses profondes: la paysannerie', part of the first volume of the *Histoire économique et sociale de la France* edited by Braudel and Labrousse that was later published separately in English translation as *The French Peasantry 1450–1660*. Likewise he contributed a revelatory ethnography of peasant daily life across France under the *ancien régime* to the equally monumental synthesis, *Histoire de la France rurale*, and wrote a book with Joseph Goy about tithes as measures of farm output which includes a crucial essay that revises and expands the arguments in *Languedoc*. Another book, *Anthropologie du conscrit français*, was a very ingenious if not altogether successful attempt to explore class and geographic differentials in national health through comparisons of the stature of conscripts in the French Army. He also edited several research anthologies and published a dozen major articles on economic and climate history—all quantitative and in the best spirit of *Annalist* interdisciplinarity. What distinguishes his work from 1970 to 1985 is not a sea-change in Le Roy Ladurie's agenda but rather his staggering ability to advance that agenda on so many fronts at once. Hunt, who should have known better, confused the chromatic complexity of his palette with faddish eclecticism or, worse, the 'cultural turn'.

His micro-histories, in fact, elaborated themes in *Languedoc.* A short account of the carnival massacre of young artisans at Romans in 1580 formed part of a chapter in *Languedoc* on the class struggles of the poor, while *Montaillou*—the great windfall of his archival explorations [9] —continued his enquiry into the conditions that made isolated mountain societies in Languedoc such hotbeds of heresy and *pensée sauvage.* Certainly the different levels of analysis in *Languedoc*, from the meteorological to the fiscal, are discrete not simply in scale but as epistemologies, but this recognition simply restates the original design of *Languedoc* as a 'total history' mobilizing a spectrum of perspectives. Likewise the study of *mentalités*, far from being an innovative conceptual framework of the 1970s, had been part of

the *Annales*' arsenal since Marc Bloch's famous 1924 analysis of popular belief in the healing power of the king's touch, *Les rois thaumaturges*, while the term itself came from Georges Lefebvre. Le Roy Ladurie, likewise, borrowed appropriate methodologies from anthropology and psychoanalysis to explore the *mentalité* of the Reformation in the Midi and its discontents. Sexual repression and its neuroses, for example, are invoked in his extraordinary account of how the Cévennes—a rugged area in the southeastern Massif Central—became a Calvinist stronghold in the sixteenth century, then erupted in 'prophetic hysteria' (the Camisard revolt) at the end of the seventeenth century. From the early 1960s, in other words, Le Roy Ladurie had already arranged seats at his table for Charcot, Freud and Lévi-Strauss, as well as Marx, Ricardo and Malthus.

The increasingly common depiction of *Montaillou* and other case studies as a retreat from structuralism and the Braudelian paradigm considerably rankled him. 'After all', he scolded a critic, 'what can be closer to the ideal of anthropological history, as nurtured by *Annales*, but a history of a village?' [10] Likewise, he made no apologies for his constant interdisciplinary inventiveness—after all the semi-official *raison d'être* of the *Annales* project was creative dialogue with all the social and natural sciences. An extraordinary example was his 1980 book, *Love, Death and Money in the Pays d'Oc,* in which he enlisted Lévi-Strauss, Bakhtin and an army of folklorists to help uncover the magical belief system expressed in the iconic Occitan novella, *Histoire deJean-l'ont-pris*. 'Perhaps Le Roy Ladurie's most brilliant quality', Robert Forster observed in his 1982 evaluation in *The American Historical Review*,

> is his capacity to link new types of sources with disciplines outside traditional history. These sources included meteorological data, parish registers, rent and production series, health and crime statistics, as well as oral traditions, myths and local mores. They have been quarried and shaped with tools from the neighbouring disciplines of demography, economics, medical history, and sociology, anthropology and social psychology.

Even as his anti-Communism grew more virulent in the late 1970s, he remained comfortably fluent in the vernacular of undogmatic Marxism or, as he often preferred to say, historical materialism. Reviewing Guy Bois's explicitly Marxist work, *Crise du féodalisme* (1976), under the heading 'En Haute-Normandie: Malthus ou Marx?' he asserted the virtual identity of their findings and conclusions, implying that if one said Malthus and the other said Marx, it was equivalent to Gershwin's 'you like to-may-toes, I like to-mah-toes'. [11] Similarly in a short but very even-tempered response to Robert Brenner's critique of 'the neo-Malthusian paradigm' in *Past and Present*, he accurately disclaimed the charge that simplistic demography had disenfranchised class analysis in his account of peasant society. He agreed with Brenner that early modern England demonstrated an 'evolution of seigneurialism towards capitalism' that by and large did not take place in Bourbon France, but he pointed to a second mode of agricultural modernization: the non-demesne-based revolution in farm output achieved in Catalonia, Flanders and Holland. [12] His review of Bois and his reply to Brenner were evidence of the occluded Marxism that still provided the essential framework for his studies of rural France.

Change in the weather

In the late 1980s, however, his writing suddenly changed both tone and focus as he moved away from famines, peasants and witches to concentrate on the politics and personalities of the *ancien régime* itself. This shift in interest coincided suggestively with his own elevation to the periphery of power during the stormy years of Mitterrand's 'cohabitations' with Chirac and then Balladur. In 1987 he was appointed the Administrator General of the venerable but obsolete Bibliothèque Nationale, and soon became embroiled in the battle over Mitterrand's plan to build a colossal new

library in the 13th arrondissement: the last of his regime's *grands desseins*, and the one that would ultimately bear the president's name. Le Roy Ladurie had hoped to become the 'pope' of this new Vatican of French history but was sacked instead in 1994 after disagreements over its pharaonic design. During the first two years of his BN tenure, meanwhile, a historians' war had broken out over the bicentennial of the French Revolution, with liberal *enragés*, led by François Furet, conducting a show trial of left intellectuals they accused of standing in the 'genocidal' shadow of the Jacobins. This was the polarized atmosphere, with the Berlin Wall fallen in the background, in which Le Roy Ladurie wrote two ambitious books on the political history of the *ancien régime*: both of them contributions to a completely new version of the classic *Histoire de France Hachette*.

This project was difficult to reconcile with even the most generous definition of 'the spirit of the *Annales*'. Some gloated over Le Roy Ladurie's 'return to the event', while others denounced his volumes as little more than a revisionist apologia for Bourbon absolutism. The second volume—*The Ancien Régime: 1610–1774*—was particularly controversial. [13] William Doyle, who confessed that he considered Le Roy Ladurie the 'liveliest mind in French history this century', was appalled by 'his admiration for the achievements of absolutism': 'nobody who knew his work could believe that he would ever consent to become a mere chronicler' of power. [14] In his review, Oxford's Laurence Brockliss wondered whether in this 'very unAnnaliste work' Le Roy Ladurie had not 'sold his soul entirely to the devils of Richelieu's Académie': 'This is not just a "top-down" account of seventeenth- and eighteenth-century France but a work that repeatedly goes out of its way to present the kings and their ministers in the best possible light. Richelieu, Mazarin and Colbert may all have had their fingers very deeply in the till, but they were still the promoters of internal peace and prosperity: *raison d'état*, centralization and absolutism were means to a good end.' [15]

Le Roy Ladurie's response to Brockliss's review was both droll and disingenuous: 'Brockliss accuses me of being some sort of Tocquevillian dinosaur. The comment, unmerited as it is, would not be such as to displease me. Let me return the compliment by saying that he is a sort of amicable Bismarckian or Marxist survivor.' He dismissed all imputations of new agendas, sympathies for the devil or defection from the Braudelian road, and pointed to the innumerable 'structural facts' interpellated in the narrative. But he wasn't completely convincing, especially in the context of a designated 'history of France', rather than a history of the state or the monarchy. *The Ancien Régime*, to be fair, is a fascinating book, unchallengeably astute in its presentation of the labyrinth of domestic and foreign challenges faced by successive Bourbons and their cardinal-ministers, almost mirthful in play with the paradoxes of the era, but more concerned to dismantle 'black legends' about the monarchy than to arraign it for its enormous human casualties. From the historian who helped invent new forms of grassroots history in the 1960s and 70s, it is surprisingly bereft of any dialectic between 'top-down' and 'bottom-up' perspectives. (The dialectic is in fact rotated 90 degrees to become a narrative of 'openings' and 'closings' of opportunities for liberal self-reform within the *ancien régime*.) Moreover, in his conclusion he explained that he was setting the stage for the next volume in the Hachette series, François Furet's *Revolutionary France, 1770–1880*—'the logical complement, and one of the first importance, to [my] two volumes'. [16]

What was left to say except that Le Roy Ladurie had become a fully paid-up member of Furet's so-called Galaxy of anti-totalitarian, anti-structuralist intellectuals? Or perhaps not. The political histories were soon followed by another major work on nobility and power that clearly renewed his membership in the *Annales*: *Saint-Simon and the Court of Louis XIV* (1997). Here the perspective is both more familiar and more original. A capstone to his micro-histories (as well as an ideal complement to Roberto Rossellini's 1966 film *La Prise de pouvoir par Louis XIV)*, this brilliant ethnography of court society explores the primal categories of the aristocratic mind: hierarchy, legitimacy and conspiracy. Using the voluminous (and scandalous) memoirs of the Duke of Saint-Simon as his principal source, Le Roy Ladurie anatomized the society of the nobility at Versailles with scientific detachment, like

Lévi-Strauss studying the Nambikwara tribe in the Mato Grosso. If he also adopted a revisionist and generally positive view of the Orléanist Regency, and hinted counterfactually at episodic openings toward liberal monarchism *à l'anglaise*, he symbolically balanced the picture by recommending a 'plebeian counterpoint' view of the period: Marcel Lachiver's *Les Années de misère: La famine au temps du Grand Roi*, a book more likely to turn a reader into an angry Jacobin than a neo-liberal. [17]

His anti-galactic trajectory continued in the late 1990s after his retirement from the Collège de France where he had been Braudel's successor. Instead of continuing to follow the neo-liberal exodus away from social and material history, he returned to a first passion: the study of weather as an integral part of the ecology of traditional agriculture, the subject of his pathbreaking 1967 book *Histoire du climat depuis l'an mil*. The result in the late 2000s was the monumental trilogy *Histoire humaine et comparée du climat,* which weaves a wealth of new research into a panoramic narrative of the role of climate variability in French and west European history since the fourteenth century.[18] Back in the mid-1950s when Le Roy Ladurie first baptized himself in the archives of Montpellier and Avignon, only Braudel and Labrousse were enthusiastic about his proposal to investigate the relationship between climate and agricultural production as part of his dissertation on the peasantry of Languedoc. Other friends and colleagues scoffed at his interest in climate history. Today every researcher in the records of grape harvests, grain prices and restless Alpine glaciers acclaims Le Roy Ladurie as the founding father of historical climatology as well as the continuing inspiration for their discipline. Yet some academic historians, from both the right and left, still snicker at his climate research as a 'false history' or mere speculation. [19] Amongst Marxist historians, however, Guy Lemarchand warmly applauded Le Roy Ladurie for 'putting history back on its feet' (via its belly) by offering fresh perspectives on subsistence struggles under the *ancien régime*. [20]

The *Trilogy* offers little consolation to those eager to embalm his thoughts in one simplistic category or another. Within the academy, at least, the battle of ideas in Paris has come to be seen as an annual fashion show. 'What big new idea or self-righteous cause will bounce down the catwalk from the Rue d'Ulm or Place Marcelin Berthelot this season?' Le Roy Ladurie's sudden appearance in vintage sixties clothing is disconcerting. Has he launched a clever anti-fad or just relapsed into nostalgia? Or is he just reminding us of what he said in his famous inaugural lecture at the Collège de France in 1973: 'Epistemological breaks may be heard snapping in all directions and hemlines move from knee to ankle and back: the *Annales* historian will still be there, imperturbably adding up columns of figures.' [21]

Paix des braves?

If Le Roy Ladurie, now in his late 80s, ardently remains a puzzle, he nonetheless loves to provide clues. In 2008 he clarified some of his current views in candid conversation with two leading contributors to the *Annales historiques de la Révolution française* (AHRF), a journal that many consider to be the last red flag flying in French academia. Guy Lemarchand and Karine Rance engaged him on two major points. [22] First, Lemarchand—who still writes occasionally for *L'Humanité*—asked Le Roy Ladurie—who later endorsed Sarkozy—whether he would support an honourable ideological ceasefire (*paix des braves*) between French historians, especially those who still reclaimed, in one form or another, the 1960s commitment to historical synthesis. (Both Le Roy Ladurie and Lemarchand had been students in the 1950s of the great economic historian and old socialist, Ernest Labrousse.) Second, Rance, a young historian from Clermont-Ferrand, sharply questioned the *raison d'être* of Le Roy Ladurie's *Trilogy*, and its claims about the impact of climate upon traditional peasant economies.

Le Roy Ladurie addressed the first point by disassociating himself from the 'steely contempt' with which neo-liberal historians regard the AHRF and the research tradition of Albert Mathiez, Georges Lefebvre and Albert Soboul. However

conservative in his political views, he claimed that he 'felt far more at ease with the partisans of the AHRF' than with the 'stratospheric and disembodied zealotry of the new historians who pursue the flight of ideas into the ozone layer'. In contrast, he extolled Edward Thompson's pathbreaking work on subsistence crises, bread riots and the role of plebeian women in such protests. Similarly he cited Jean Nicolas, whose monumental study 'The French Rebellion—Popular Movements and Social Conscience (1661–1789)' might be considered a French counterpart to the writings of Thompson and Eric Hobsbawm. He also praised the African-American medievalist William Chester Gordon for his history of the apocalyptic famine of 1314–15, and the 'old-time secular republican' Marcel Lachiver for his *Années de misère*. Amongst other left-wing *compatriotes* still ploughing the rich loam of French rural history, he acknowledged his particular debts to Guy Bois, Alain Croux and Lemarchand himself. 'And behind all these, so often forgotten', he added for maximum surprise, 'there is that great theoretician of spontaneous mass action, Rosa Luxemburg, whose memory I am one of the few still to cultivate.' Regarding his personal admiration for Furet, he claimed that he had never completely endorsed his friend's historiography. [23] 'His allegiance was to a purely political history, while I am oriented toward rural history, ethnology, ecology and especially climate. I blend perspectives from meteorology, economic and social history, from the apolitical as well as the political.' In short, 'I am and will remain simply an old historian of the École des Annales.' [24] Indeed, in his fidelity to the ideal of 'scientific history' and his renewed investment in the original programme of quantitative research, is he not the last *Annaliste*?

Discussing his trilogy, Rance expressed keen scepticism about treating climate as an independent variable in economic history rather than as a secondary parameter, or even red noise. Her question, to which we will return, crisply challenged the relevance of Le Roy Ladurie's entire project:

> Can the 'repetition of the meteorological accident' truly be considered as 'giving structure' to agrarian society? Certainly if a cycle of poor harvest/rising prices/bread riot recurs, this doesn't necessarily require that climatic accidents share a periodicity or any other kind of regularity. So in making climate one of the variables of these [socio-economic] cycles, isn't there the risk of superimposing temporalities from the natural world, cycles which are totally exogenous, and confer only an aleatory significance to the key variable?

Le Roy Ladurie, sidestepping her actual question, agreed that major harvest failures, whether as a result of drought, cold or deluge, were extreme events that occurred irregularly; nevertheless they also revealed the deepest layers of a social formation: 'Subsistence crisis is to social history what the supernova is to astronomy. It's a cosmic candle that illuminates all the history that both precedes and follows the catastrophe. Supernovas, likewise, do not recur at regular intervals, but they expose the deep stellar processes, which is why they are the objects of such extraordinary interest. Ditto for crises of subsistence and major mortality events.' When Lemarchand complained about the ceaseless attempts by conservative and neo-liberal historians 'to break the dialectical links between the different instances of the social totality', such as between politics and property, Le Roy Ladurie reaffirmed the concept of 'mode of production', but proposed to expand it: 'I'd simply insert nature and climate fluctuations into the forces of production.' He pointedly observed that he had been making more or less the same argument for fifty years and wondered why so many Marxists ignored the variable natural conditions of production. He wryly implied that they were perhaps less Marxist than they imagined, and that a true materialist interpretation of history would always need a weatherman. [25]

Some Marxists, in fact, have embraced this more encompassing definition of mode of production. Le Roy Ladurie acknowledged Lemarchand himself as an important exception, together with the great medievalist Guy Bois. Outside France he could

have counted more. Amongst English-speaking Marxists, Canadian historian Wally Seccombe probably comes closest to the Ladurien point of view. In his important book, *A Millennium of Family Change*, Seccombe warned that to leave raw materials and geographical endowments, including climate, 'out of a conception of the means of production is to cut the productive forces off from nature, reintroducing the latter from the outside as a peripheral consideration. This is a fatal error, since it places the mode of production "on top" of a natural template, as opposed to being embedded *in* nature, as in reality all modes of production are.' [26]

History without 'men'

The study of climatic change was once described by the famed British meteorologist Reginald Sutcliffe (chief forecaster for the RAF's campaign against Germany) 'as a labyrinth of science entered at one's peril, at the risk of never escaping with one's life'. Le Roy Ladurie accordingly entered with enthusiasm but also great caution. As he came to understand both the limitations and potentials of existing archives, as well as the dangers of conflating trends in regions with inherently different climatologies such as the north and south of France, he adopted a research strategy that many came to regard as unnecessarily conservative and frustratingly devoid of short-term results. He deferred, at least in principle, the testing of hypotheses about the role of climate in early modern French history until reliable annual temperature and precipitation data for the pre-instrumental period had been assembled.

'L'histoire du climat', accordingly, has had from the early days two carefully distinct meanings in his work, the second of which is dependent upon the maturity of the first. [27] In a seminal 1959 article, he argued that the only way out of the impasse of an older climate history that notoriously relied on anecdote, hypothesis and bad logic was to 'turn to methods of climatological study, biological or at least historico-statistical methods', 'ruling out any pre-conceived ideas from the start' in order to arrive at a 'rigorous annual series of meteorological data': 'Once this preliminary step has been taken and the climatic factor isolated and identified, the historian can proceed to try to determine the possible influence of this factor on the life of men.' [28]

Six years later he posited the priority of 'a *pure* climate history that aims to establish a baseline of raw climatic facts and series that are necessary to pass to a *second* series: ecological factors, human influences on climate, and so on'. [29] Although extreme weather events, like the great drought of 1680 and the arctic winter of 1709, figured prominently in his history of Languedoc, he suspended judgement on whether they conformed to some larger, non-random pattern of climate change such as the so-called Little Ice Age. In *Histoire duclimat* this crucial conditionality again frames his approach. Documentary evidence,

> provided it has been critically examined and duly translated into quantitative terms, can serve as source material to the historian of climate—on condition, of course, that he works via the history of the various different meteorological factors in themselves: temperature, rainfall, and then, where possible, wind and barometric pressure, sunshine and cloud. *It is on these conditions only that fictionalized history of climate can become scientific history of climate, just as alchemy eventually turned to chemistry*. [30]

It's difficult to conceive how anyone could be confused by this fundamental and oft-repeated contrast between the collection and interpretation of data and its eventual application to the study of the past; it literally undergirds all of Le Roy Ladurie's early writing about climate. The first phase of research (should we pun 'climate-for-itself'?) is today regarded as *historical climatology*: an important scientific sub-discipline that uses documentary sources—harvest dates, Alpine glacial records, weather diaries, and so on—to construct local and regional meteorological time series. Where such records

overlap with the instrumental period (beginning in 1657 in England) it is possible to calibrate their relative accuracy, as has been done for decades with natural proxies like tree rings, ice cores and lake sediments. [31] More recently, high-quality natural proxies have been used to directly truth-test archival data.

However in *Histoire du climat* (1967), published the season after Lacan's *Écrits* and Foucault's *Order of Things,* at the height of what Pierre Daix labels the 'structuralist explosion', he obscured this straightforward distinction between historical climatology and its future application to historical studies with unfortunate hyperboles tuned to fashionable Parisian wavebands. [32] Thus Le Roy Ladurie called for 'the construction of a pure climatic history free of any anthropocentric preoccupation or presupposition': 'It is mutilating to the historian', he claimed, 'to make him into no more than a specialist in humanity.' [33] Although he was only paraphrasing Braudel's well-known command that 'social realities must be tackled *in themselves and for themselves*' and not just as backdrops to narrative, [34] his declarations were widely construed as provocative ultra-structuralist slogans along the lines of Lacan's 'the structures have descended into the streets' or Althusser's applause for theoretical 'anti-humanism'. This interpretation was reinforced when in 1973 he used 'History without Men' as a heading for the section on climate in his anthology *Le territoire de l'historien* and entitled his iconic lecture at the Collège de France that year as 'L'histoire immobile'—a term suggesting radical philosophical connotations, when in fact Le Roy Ladurie was referring to what other historians—Goubert, for instance—prosaically called the 'old demographic regime'. [35]

As a result, the legend developed that Le Roy Ladurie, *contra* Marc Bloch and the original humanist tradition of the *Annales*, was not only evicting humanity from history but enthroning the rule of a reactionary empiricism that rejected the very concept of historical change. Both *Histoire du climat*and *Languedoc* were deemed to embody this arid epistemology—a canard embroidered by historians as well as journalists. For instance, Stuart Clark, the editor of a four-volume set of critical commentaries on the school, has matter-of-factly asserted that Le Roy Ladurie 'became famous for proposing a peopleless, changeless history, dominated by the computer'. [36] François Dosse, the editor of *Espaces Temps* and an arch-enemy of quantitative history, likewise claimed in his book on *Annales* that Le Roy Ladurie 'completed a concrete historical study on climate from the year 1000 without having man as a major or minor figure. He established a periodization of changes in climate *per se* without worrying about their impact on human society.' [37]

As for the characterization of *Histoire du climat* as an essay in anti-humanism, flipping a few pages will immediately reveal that it is heavily populated with human subjects and societal disasters, and if Le Roy Ladurie proposes a methodology that postpones judgement on climatic impacts until the events themselves have been verified and studied, it is, as we have seen earlier, simply the scientific method. At the same time, critics ironically ignored the work's chief vulnerability. As Le Roy Ladurie recently admitted, the book flagrantly broke its own Jesuitical rules of method, especially the moratorium on historical interpretation. 'Although my book depicted itself as "pure" physical history, I could not refrain from alluding to the role of bad weather in major subsistence crises. Without openly admitting it, I was straying from the self-imposed limits of pure history to arrive at an "impure" discipline where weather disasters and human catastrophes legitimately intermingled.' [38]Nonetheless he insists that his two-stage strategy was still the rational approach. Major progress in historical climatology was the precondition for serious research into the societal consequences of climate change. [39]

Data assembly

It should be recalled that when *Histoire du climat* was published, pre-1800 agricultural meteorology was just being reconnoitered, and the role of climate variability in early modern European economic history was simply conjectural. There

were surprisingly few important hypotheses on offer, and those mostly concerned sunspots and solar cycles. In terms of scientific theory, meanwhile, France was the last major country to make the transition from statistical to dynamic meteorology, from mere record-keeping to physics-based modelling, and in this context Le Roy Ladurie was avant-garde in his appreciation of the revolution that had been taking place in weather science since the early 1940s. Only a tiny cadre of researchers, mainly in Great Britain and Central Europe, were exploring the possibilities for assembling pre-instrumental databases that could be interpreted by the new physical models of weather regimes and climate change. But the actual synthesis of historical and dynamical meteorology was still far over the horizon.

Although one could speculate about any number of seductive correlations, such as the association of mild weather with the great early medieval land clearances or the later role of cool, wet summers in the long economic crisis of the seventeenth century, Le Roy Ladurie warned historians to resist the Sirens' call until they had legitimate data. 'These are fascinating questions', he wrote, 'but difficult to answer: the presuppositions they imply are not clear, and the right method of approach has not yet been found.' And until it was found, it was not possible to address the decisive question: '*Can a difference in secular mean temperature which is under, or at the most equal to, one degree centigrade, have any influence on agriculture and other activities of human society*?' In effect, he was asking historians to take a vow of celibacy that he sometimes broke himself: no intercourse with sweeping climatic interpretations of history until enough reliable numbers had been counted and were in place. Only when the quantitative foundations had been laid in the form of reliable time series of key meteorological variables, and then after the identification of the synoptic (regional) or even global mechanisms of extreme weather, would it be possible to make the leap from the history of climate into the role of climate in human history: 'Climatic history would then become ecological history, asking whether fluctuations of climate—or, more modestly, the brief fluctuations of meteorology—have had significant impacts on human habitat; on harvest and thus on economy; on epidemics and diseases, and thus on democracy.' [40]

The drama of the arrival of his recent trilogy, almost forty years after the publication of *Histoire du climat,* is that this moment of historical interpretation has finally arrived. [41] Le Roy Ladurie at last makes the leap from the primitive accumulation of data to provisional historical synthesis, from historical climatology to ecological history—that is to say, 'histoire du climat' in the second sense. *Canicules et glaciers*, Volume One of *Histoire humaine et comparée du climat* opens with a celebratory declaration:

> Since the appearance of my *Histoire du climat depuis l'an mil* in 1967, historical climatology has achieved its full legitimacy thanks to the work of Christian Pfister, Pierre Alexandre, Van Engelen, Philip Jones and many others. It's no longer possible for fashionable historians to sarcastically dismiss the new discipline as 'false science'. The time for jeering is well over, and the present work now addresses the history of human climate, considering the impacts of climate and weather fluctuations upon our societies, particularly agricultural output and, in certain cases, epidemic disease.

The salience of pre-industrial climate history, of course, had been completely and unexpectedly transformed from the early 1990s by the controversy over global warming and, particularly, the denialists' contention that late-twentieth-century extremes fall within the boundaries of previous historical fluctuations. Suddenly the small garden that Le Roy Ladurie and a few colleagues had cultivated in obscurity for so many years became the Western Front of the climate wars, with well-armed research teams deploying supercomputers to streamline data sets and test hypotheses about the underlying causes of natural variability—for instance, the

relative importance of volcanic events and solar minima. The research literature on topics such as the Medieval Climate Optimum, the Little Ice Age and the Maunder Solar Minimum grew almost exponentially. Meanwhile spectacular breakthroughs in understanding the inter-annual impacts of El Niño/Southern Oscillation (ENSO) upon societies of the tropics and semi-tropics encouraged hopes that similar progress would be made in deciphering the role of the more enigmatic decadal and centennial oscillations in the meteorology of the temperate Northern Hemisphere. The explosive growth of climate science indeed was generating more studies and corresponding controversies than historians could hope to assimilate.

The actual interface between historical and scientific expertise—the network of specialists who are truly bilingual in debates on either side of the divide—is very small (imagine a tiny border outpost with a few dozen inhabitants), and Le Roy Ladurie's renewal of the Braudelian project risks misinterpretation by narrative historians and followers of French thought. Anouchka Vasak, a young colleague who has interviewed him extensively, predicted that the *Histoire humaine et comparée du climat trilogy* will be misconstrued as a *rupture épistémologique* rather than the culmination of an old and relatively coherent research programme. 'If there was one Marx before the *1844 Manuscripts* and another afterwards, people will ask if there is also not a true and a false Le Roy Ladurie, historian of climate?' [42] In this interpretation, the Le Roy Ladurie who supposedly expelled humans from environmental history in *Histoire du climat,* now—almost two generations later—puts the fate of civilization at its very centre. Another danger is a misreading of the trilogy that regards it as little more than a compilation of useful facts, a technical almanac. Although Le Roy Ladurie has now published no fewer than three epitomies of the larger work, his greatest achievements, including the extraordinary *quality* of his data—both of weather events and their socio-economic context—and the interdisciplinary cooperation that makes this possible, are unlikely to be legible to readers guided only by conceptual maps of French historiography. Likewise those mainly acquainted with the scientific literature may find themselves vexed by the intricate historical controversies that Le Roy Ladurie addresses.

2. THE LAST ANNALISTE?

Le Roy Ladurie's route to the topic was uniquely personal. As he has explained in interviews and autobiographical essays, his lifelong interest in climate variability and subsistence crises arose from growing up on a 120-hectare estate in Calvados where unexpected summer rains would sometimes destroy an entire harvest drying in the fields, including on at least one occasion his father's crop. His Norman clan were prominent Catholics, army officers and Orléanists. After the First World War, which killed 690,000 French farmers, his father Jacques became the Secretary-General of the Union Nationale des Syndicats Agricoles (UNSA), a Catholic peasant union that during the Depression grew into the most powerful farm group in France. [43] It advocated protectionism and the corporatist reorganization of agriculture, and allied itself with the openly fascist agrarian Greenshirts against the Popular Front government of Léon Blum. [44] In his history of the twentieth-century French peasantry, Gordon Wright described UNSA activists like Jacques Le Roy Ladurie as 'a new generation of rural conservatives who had come into prominence after 1930: men who operated large or middle-sized farms, or the sons of such men; men who had attended one of the higher schools of agriculture (usually Catholic); men who were active in agrarian syndicalism.'

Pétainist to Zhdanovist

After the country's collapse in 1940, 'peasantism' and 'back to the land' became central motifs of the New Order, and 'it was the UNSA that provided Vichy with both its doctrine and much of its personnel'. The movement's triumph, a few months after Pétain, 'le Maréchal-paysan', took power, was the creation of the monolithic

Corporation Paysanne. But its goal of recentring French life around prosperous farm villages was immediately menaced by the locust-like demands of the Germans for food and labour. [45] As a twelve-year-old, self-described 'micropétainiste', Emmanuel watched his father—for a short period, the Vichy minister of agriculture and food supply—struggling desperately in the face of German requisitions to bridge the gap (*faire la soudure*) between the depleted grain stocks of 1941 and the expected harvest of 1942. This ancient problem of the *soudure* between one harvest and the next—the crux of any subsistence crisis—would become a recurrent theme in his histories. Although his father resigned from the Laval government in protest against the conscription of French civilians for labour service in Germany and eventually joined the Resistance, during the Liberation he was denounced as a collaborator, arrested and beaten: a humiliation that Emmanuel attempted to redress years later when he published his father's account of the struggle against expected famine in 1942. [46]

Even Le Roy Ladurie's conversion to Communism as a lycée student in Paris in 1949 had a surprising agrarian aspect. The world of the PCF, of course, revolved around Renault Billancourt, Flins, Le Havre and other fortresses of the industrial proletariat, but there is little evidence in his interviews or in his political autobiography, *Paris–Montpellier*, of the romantic affinity with miners and factory workers that brought so many other bourgeois intellectuals into the ranks of French Stalinism. Of course Le Roy Ladurie supported the *classe ouvrière*, but his own burning bush was the victory of the Chinese revolution, the greatest peasant insurrection in world history. 'It was China's tilting toward communism in 1949', he later wrote, 'that led me to leave behind my identity as a child of the right.' He idolized Mao as 'a brave agrarian reformer, the good father of communism, who established, I thought, a new and fraternal democracy for one quarter of humanity'. [47]

He thus entered the École Normale Supérieure (ENS), as he put it, 'with double DNA—one strand of having been a twelve-year-old supporter of Vichy, the other of being a teenage convert to communism'. [48] Amongst the fellow Communists that Le Roy Ladurie encountered at the ENS in 1949–53 were Michel Foucault and Louis Althusser. With Korea, Indochina and the execution of the Rosenbergs in the background, Le Roy Ladurie's cell at the Rue d'Ulm was mobilized to defend the Cominform's 'two camps' line that calumniated supporters of Tito and non-denominational socialists as disguised members of the imperialist camp. The non-dogmatic, eclectic Marxism common in the *Annales* group, which had already made them an anathema to academic conservatives, now made them radioactive to Communists as well. A Rockefeller Foundation grant that helped launch the Sixth Section was offered as proof that Febvre and Braudel had sold out to the American monopolists and were assisting their ideological offensive in France. Even Braudel's famous division of history into a triad of the *longue durée* (environmental history), the *conjoncture* (socio-economic history) and *histoire événementielle* (political history) was interpreted as an expression of his 'fear of the proletarian revolution'. [49]

The PCF students at the ENS and the Sorbonne in the early 1950s were party-line zealots (just as most of them would become anti-communist zealots in the 1970s); indeed Le Roy Ladurie confesses that he was a full-fledged 'Zhdanovist'. When in early 1949—just before Le Roy Ladurie entered the ENS—Georg Lukács, the most famous communist philosopher in Europe, came to Paris to debate the Existentialists, he became an instant hero to the PCF students in the Latin Quarter; a year later, when Lukács was being denounced in Budapest and Moscow, and in great danger of his life, they threw his books away. But, nonetheless, the historians among them, led by Le Roy Ladurie and François Furet, were slowly but irresistibly attracted to the aura of 'scientificity' that surrounded *Annales*' heretical paradigms. They chafed at the almost exclusive focus of older communist historians on workers' organizations, while leaving unstudied the enchained class itself or the world of its peasant ancestors. In crucial respects *Annales* seemed more truly materialist with its emphases on statistics, structures and *mentalités.* Inspired by Pierre Vilar, a history lecturer at the École pratique des hautes études, who was both a PCF supporter and an Annaliste, they

'firmly planted their feet', in La Roy Ladurie's words, on the side of quantitative history. Vilar became a mentor, introducing them to a young Marx whom Le Roy Ladurie and others found far more attractive than the old beard on a Party pedestal. [50] A decade later, Vilar—still the most intransigent Marxist member of the second-generation *Annales*—vigorously defended its epistemology against renewed attacks from the PCF, this time led by Althusser: 'However imperfect its interpretation may still be, it is the objectification of the subjective through statistics which alone makes materialist history possible—the history of masses, that is both of massive, infrastructural facts, and of those human "masses" which theory has to "penetrate" if it is to become an effective force.'

Annales and la France profonde

'Massive, infrastructural facts' meant economic and demographic history. Thus it was not surprising that Le Roy Ladurie, Furet and others gravitated to the economic historian Ernest Labrousse at the Sorbonne who became the supervisor of their work. Labrousse was a key link not only to the family of the *Annales* but also to the legacy of François Simiand, the founder of economic sociology, with whom he had studied. Labrousse—who described himself as both a Marxist and a marginalist—was the pioneer and chief advocate of 'serial' history based on the construction of long data series. His celebrated 1933 study of price and income trends in the eighteenth century served as a model for quantitative studies in other areas, especially historical demography. Through him, *Annales*historians became familiar with the ideas of economic-cycle theorists like Kondratieff and Kuznets and more generally with the concepts of *longue durée*, *structure* and *conjoncture* which Braudel later popularized. Labrousse contrasted crises of the *ancien régime*, which he considered mainly meteorological, with modern industrial crises caused by the 'irregularity' of investment. He also wrote the first economic interpretation of the French Revolution and was the empresario of dozens of doctoral students working on heavily statistical labour and regional histories. [51]

Influenced by this agenda, Le Roy Ladurie proposed a thesis on the global economic crisis of 1873—one of the nineteenth century's greatest convulsions, that to this day lacks any commanding comparative history. But when offered a teaching post at the Lycée de Montpellier, close to his wife's family but far from the archives in Paris, Le Roy Ladurie was compelled to find a new topic and a new century: 'One of my friends [the geographer Raymond Dugrand] advised me to go take a look at the *compoix* [the cadastral surveys used to assess the hated land tax, the *taille réelle*] and find a topic on the history of the Languedoc countryside.' He quickly determined that the region's cadastral archives were indeed an immense databank for understanding 'the conquest of the countryside by capitalism'—the subject that now riveted his interest. His thesis director, Labrousse, was only too happy to enrol him into 'the battalion of doctoral students that he was sending into every region of France to research the big questions of social and economic history'. [52] Languedoc was both a missing link in the spectrum of regional studies supervised by Labrousse and a logical continuation of Braudel's *Méditerranée.* In any case it was an obvious attraction for a Marxist historian: Languedoc had a well-deserved reputation as the most rebellious province of France, a crucible of heterodoxy and discontent, and a bastion of persecuted minorities: Cathars, Beguines, Waldensians, Calvinists, witches and Camisards.

Le Roy Ladurie, despite certain risks, immediately fell in love with the region's Romanesque towns—walled cities, fortified churches and impregnable châteaux left by centuries of violence—and their sunny but hardscrabble hinterlands. [53] The Languedoc of his dissertation, of course, was a province or *gouvernement* of the *ancien régime* before it was split up into *départements* by the Constituent Assembly in 1790. In some aspects, pre-revolutionary Languedoc, descended from the powerful and heretical medieval County of Toulouse, was a *sui generis* political entity—a *pays d'états* preserving some fiscal and legal autonomy, with its *parlement* in Toulouse and its *états* and *intendant* in Montpellier. Comprising 8 per

cent of the population and 10 per cent of the land area of seventeenth-century France, its administrative borders extended from the Rhône to the upper Garonne with the Massif Central as its northern edge. In Caesarian fashion it was divided into three parts. [54] Haute-Provence, centred on Toulouse and the upper valley of the Garonne River, included the rich wheat fields of the Lauragais plain. Bas-Languedoc, separated by mountains, comprised the drier Mediterranean coastal plain with sandy soils and malarial wetlands, and, abruptly above the plain, the scrub-covered limestone plateaux—the *garrigues*—degraded by centuries of slash-and-burn clearing. Towering above the *garrigues,* in turn, were the wild peaks and deep gorges of the Cévennes, the southeastern and highest part of the Massif Central.

Before the eighteenth-century viticultural revolution in Bas-Languedoc, which took advantage of the vine's ability to thrive on the poor soil of the *garrigues*, the traditional subsistence ecology combined transhumance—summer pastures in the Cévennes and winter grazing in the *garrigues*—with wheat cultivation on the coastal plain. Together with small vineyards, horticulture constituted a secondary level of the economy with the widespread but small-scale cultivation of olives, chestnuts (a reliable famine food), and in the valleys of the Cévennes after 1600, the mulberry. A perennial labour surplus in the uplands was a boon when harvest help was required, and a menace when hunger drove herders and marginal peasants down into the plain and towns. The wheat agriculture of the Languedocian plain had little capacity to absorb excess labour and was ecologically ill-adapted to periodic drought. The vine, in contrast, was perfectly suited to the long Mediterranean dry season but could generate peasant subsistence only through the commercial exchange of wine and grain, which in turn depended upon non-local markets and transport infrastructures that largely did not exist in the seventeenth century. Thus the paradox of a potentially rich land—today, 'France's California'—dependent for its subsistence on a staple that was most efficiently grown outside the region, in Haute-Languedoc and the north.

Although the archives of Languedoc were the core resource for Le Roy Ladurie's project, he also consulted, sometimes intensively, the records of Guyenne, Gascony, Provence, Dauphiné and the Alps, for glacier histories. The geographical parameters of his thesis, moreover, expanded and contracted between Languedoc and the entire Midi, or Occitania, as necessary for illustration and argument. Analytic and statistical comparisons with Languedoc's two sisters, Provence and Catalonia, were attenuated in the ultimate thesis only because they were the subjects of parallel research projects conducted within a unique community of scholarship led by Braudel and Labrousse after the death of Febvre in 1956.

Regional dissertations framing larger issues—despite Braudel's occasional misgivings—were the true foundation of the postwar historiographic revolution in France. The original template was Lucien Febvre's *Franche-Comté in the Age of Philip II*, a *thèsed'État* published in 1912, described by Braudel as 'a masterpiece which realized ahead of time all of the future programme of the *Annales*'. [55] The Franche-Comté, squeezed between the Vosges and Jura mountains, was the strategic corridor—the Spanish Road—for armies and goods passing between Lombardy and the Rhine, making its possession critical to the grand strategy of the Spanish Hapsburgs and its conquest equally important to France and the Netherlands. After a peaceful slumber under the benevolent rule of Charles V, the Franche-Comté became a charnel house during the reign of Philip II: a crisis that illuminated all the class and religious tensions of this highly distinctive society that was one of the last strongholds of serfdom in Western Europe. Febvre, in effect, chose the Franche-Comté because it concentrated in one place all the principal contradictions of the late sixteenth century: bourgeois versus noble, absolutism versus seigniorial autonomy, feudal tenure versus freehold, peasants versus armies, and Reformation versus Counter-Reformation. [56] This passion for regional studies became even stronger in the postwar period, reflecting the fact that the *Annales*' second and third-generation leaders were, like Le Roy Ladurie, mostly country boys: Braudel, always a redoubtable peasant, was from the Meuse near Verdun, as was Pierre Chaunu, while Labrousse was from the cognac country of the Charente, Pierre Goubert from Saumur, and

Pierre Vilar from the small town of Frontignan in Languedoc. Most of them shared Febvre's passionate belief in the unity of geography and history that the co-founder of *Annales* had imbibed from his own teacher, Paul Vidal de La Blache (1845–1918). [57] The latter, one of geography's key theoretical figures, was particularly interested in providing a scientific foundation for the idea of 'regional personality'.

A similar influence was the Burgundian historian-folklorist Gaston Roupnel (1871–1946) whose *La ville et la campagne au XVIIe siècle: étude sur les populations du pays dijonnais* (1922) was another foundational regional study, particularly notable for its analysis of how urban *noblesse de robe* enriched themselves from the devastation of the Thirty Years War. [58] Roupnel, however, was most well-known for the book he published a decade later, *Histoire de la campagne française*, which extolled the writing of regional histories and the recovery of local cultural identities—equating the life of the land with the essence of French civilization *tout court*. Roupnel also was probably the first to use the term 'structural history' in reference to the geographical and economic underpinnings of rural life. Febvre and Braudel were his friends, as was Jacques Le Roy Ladurie—Roupnel's work was exploited by Vichy propagandists, leaving a small but uncomfortable overlap between *Annales*' thematic agenda and the ideology of the National Revolution.

Encircling the cities

The last generation that Labrousse sent into the countryside included, besides Le Roy Ladurie, such future luminaries as Maurice Agulhon (Provence), René Baehrel (Basse-Provence), Alain Corbin (Limousin), Michel Vovelle (Provence), Paul Bois (Sarthe) and Guy Lemarchand (Normandy). Thanks to both absolutism and the Republic, they had at their disposal some of the richest and most well-preserved public records in the world, making quantitative studies, in particular, easier than elsewhere. Le Roy Ladurie has praised the relatively small scale of France's sub-national jurisdictions as a boon to intensive research: 'It is obviously an advantage to have ninety rather small departments in France, which allows relatively subtle geographies.' [59]

These provincial studies, however, were anything but provincial. The monographs also had contemporary resonances. In the eyes of Le Roy Ladurie and others, seventeenth-century France was an analogue to a modern underdeveloped country, with important lessons to contribute to contemporary theories of economic growth and modernization. [60] These studies constituted an incomparable network of sites for deep historical observation and, by the 1970s, for sweeping synthesis. The cumulative achievement was a kaleidoscopic and profound view of French history as seen from outside the metropolis that has absolutely no analogue in any other major Western historiography. Following the strategy of Le Roy Ladurie's ex-hero, Mao Zedong, guerrillas from the French countryside—the most magnificently researched on Earth—encircled Paris, then routed last-ditch Sorbonnistes at the end of the 1960s. (In France a brilliant but marginalized 'provincial' historian like Aberystwyth's Gwyn Williams—who tried to envision the history of Wales in its totality from the druids to the Miners' Strike—would have ended up in the École des hautes études or the Collège de France.) Even after the dictatorship of *Annales* had been established on the Left Bank, its leaders still romanticized themselves as old partisans just come in from the *bocage* and *garrigue*.

The Annalistes had been hardened intellectually by their years in the provinces. Under the gruelling French graduate system of the time, doctoral candidates were forced to become archival Marco Polos, gone and out-of-sight for years at a time in order to produce monumental theses. Pierre Chaunu's legendary dissertation for Braudel on 'Seville and the Atlantic' was a staggering twelve volumes in length. This protracted ordeal was widely derided, especially in comparison with the 'fast' PhDs offered in Anglo-Saxon universities, but its alumni tend to remember it with some nostalgia. Although Le Roy Ladurie later played a major role in reforming French graduate education, he recalled one of the benefits of the old order: 'The French system of the

Major Thesis (*thèse d'État*), as archaic and compilatory as it may seem at first, in the end has not proved completely negative at all. A young scholar is unleashed in the archives of a department or a province for ten, even fifteen years.' [61] In Montpellier, Le Roy Ladurie eagerly joined this regional treasure hunt. In addition to the sponsorship of Braudel and Labrousse, and the friendship of Dugrand, whose parallel research on the historical geography of Languedoc proved very useful, he was able to borrow from research strategies pioneered within the *Annales* milieu.

Pierre Goubert, for instance, had set out in 1944 with the extraordinary goal of recovering as much as possible of the 'totality' of the lives of seventeenth-century peasants and artisans in the Beauvaisis, a small but densely settled area of 100,000 people, north of Paris. His dissertation, published in 1960, documented the brutal human costs of the serial civil war known as the Fronde (1647–53), which reduced the population of the Beauvaisis by one-fifth and left as its legacy the increasing poverty and class polarization that characterized the reign of Louis XIV. Surviving rural inventories from before 1650, for example, revealed modest prosperity amongst the *laboureurs* (middle-peasants who owned a plough team); by the end of the century, 'nothing was more striking than the contrast between the fat rent collector (*receveur)* and the miserable rabble who inhabited the villages'. [62] But Goubert's thesis was as important for its methodology as its analysis: his creative use of parish registers and other neglected sources to reconstruct demographics, rents and prices set the standard to which other multi-layered, quantitative regional histories like Le Roy Ladurie's aspired.

René Baehrel's 1961 dissertation on the Basse-Provence—another massive apparatus of graphs and charts sweated from land records—surprised most historians by demonstrating that in the seventeenth century the climatic differences between the north and south of France often translated into inverse harvest and income cycles despite a common monetary environment. [63] When Picardie starved after an Arctic winter, for example, Provence might prosper from plentiful spring rain. Indeed, as Le Roy Ladurie would later emphasize, Mediterranean France, although ravaged by the religious wars of the sixteenth century and still visited by plague in the seventeenth, was mostly spared from the crop damage of the Little Ice Age and the demographic decimations of the Thirty Years War and the Fronde. [64]

Meanwhile Pierre Vilar's *La Catalogne dans l'Espagne moderne*, a 2,000-page-long thesis published in 1962 when the author was 56, became the 'control study' that Le Roy Ladurie used to situate Languedoc's backwardness in a framework of possible development paths. [65] Vilar's thesis, like Baehrel's and Le Roy Ladurie's, might be described as a direct offspring and continuation of Braudel's *Mediterranean*; certainly read together in any event, it is another bravura demonstration of the method of total investigation that showed how in the last third of the seventeenth century, investments in irrigation technology and viticulture enabled an entrepreneurial peasantry to escape the curse of Malthusian 'stationary history' and raise agricultural productivity and thereby wages. 'Vilar establishes', says Le Roy Ladurie, 'that, in the heart of a traditional society, eighteenth-century Catalonia, the phenomenon of economic take-off occurred.' [66]

Finally, closer at hand and teaching at the lycée Henri-IV, was one of the leaders of the left intelligentsia in Montpellier, Albert Soboul (1914–82). Fifteen years older than Le Roy Ladurie and a veteran of the local Resistance, he was finishing his famous thesis on 'The Parisian Sans-culottes in Year Two', as well as a secondary thesis about the social structure of the local countryside on the eve of the Revolution, both published in 1958. Soboul made sophisticated use of the *compoix*, undoubtedly making it easier for Le Roy Ladurie to mine the same source for his primary thesis on the Languedocian peasantry. [67]

3. TWELVE THESES

Le Roy Ladurie's climate research debuted before historians in a trio of articles published between 1959 and 1961.[68] The most important article, 'Histoire et climat', published in *Annales* in 1959, is a powerful critique of the 'old climate history' and a programmatic statement of the 'new'. 'Essentially methodological', Le Roy Ladurie explained: 'it points out the pathways of research toward concrete knowledge rather than speculating about definitive solutions that do not yet exist.'[69] This masterful article, and its avatar chapters in *Histoire du climat*, provide a template that I believe best represents his first-generation thinking about the history of climate.

'Histoire et climat' begins with a critique of a 1954 article by the Scandinavian economic historian Gustaf Utterström, who boldly challenged demographic interpretations of pre-industrial European economic history. In Utterström's alternative model, abrupt transitions in northern European climate regimes from 'maritime' to 'continental' and vice versa were decisive in precipitating the great socio-economic crises of the fourteenth and seventeenth centuries, and conversely, in generating the periods of good harvests and population growth in the first half of the fifteenth and eighteenth centuries. As Utterström later argued:

> Ever since Malthus and Ricardo, all discussions of the pressure on food supplies have started from the assumption that population is the active factor and Nature the fixed. This interpretation, however, can hardly be reconciled with modern scientific thought . . . I have suggested in an earlier article that the development of population in Scandinavia and the Baltic regions during the first half of the eighteenth century, far from supporting the Malthusian theory of population, can only be explained by *exogenous* factors, in particular by the fact that a period of unusually mild climate occurred in the early decades of the century until it was brought to a close in about 1740 by a return to more extreme climate.[70]

Le Roy Ladurie appraises Utterström's article as 'one of the furthest points ever reached by the traditional method'—one that Le Roy Ladurie defines first and above all as 'exaggeratedly anthropocentric': that is to say, putting the climatic interpretation of history ahead of the careful reconstruction of the history of climate. But he's scathing of the 'subjective character of Utterström's documentation':[71] 'Far more than the facts—rare and little convincing—what sustains this kind of meteorological-historical research is sheer faith: as when [Eduard] Brückner explains the fall of the Roman Empire by the deviation of storm paths and the resultant desiccation of the Mediterranean region. At the base of such work is the lazy and highly contestable postulate of climate's fundamental and determinant influence on history.' Le Roy Ladurie also attacks the preference, epidemic in the old climate history, for choosing exogenous and exotic environmental explanations over conventional socio-economic causality. Utterström claimed that 'the crisis of the seventeenth century had a climatic origin and cannot be explained by internal analysis of European economies and societies in the period.' But this was not true: 'In our current state of knowledge, Utterström's examples can be explained equally well, if not better in purely economic terms.'[72] Le Roy Ladurie, of course, doesn't reject the possibility of meteorological explanations of economic events, but argues that claims about climatic influence require commanding quantitative evidence, not just speculative correlation and tales from the past. Given the notorious reputation of the old climate history, it was obligatory to keep Ockham's razor as sharp as possible. Le Roy Ladurie's alternative vision of a scientific history of climate can be most clearly summarized as a dozen theses, drawn from his works *circa* 1959–67, as a baseline of ideas for appraising his climate *Trilogy* written forty years later.

One. 'Climate' is never defined by Le Roy Ladurie, but given his embrace of the new dynamic meteorology of the 1950s, he'd probably agree with Pierre Pédelaborde's argument for a parallel 'synthetic climatology' that would replace the traditional definition of climate as the averaging of locally specific weather statistics over some long base period, usually thirty years, with the more complex idea of the frequency distribution of synoptic weather types over various time-scales of interest. [73] Today's climate modellers, armed with powerful new mathematical representations of interactions between air, ice and water, would extend this definition to encompass the total ensemble of climate-system states, integrating all three dimensions, that occur in some interval. In either case, weather—daily, monthly, seasonal, annual—may be generated chaotically by fluttering butterflies in a jungle half a world away, but in general it can be classified within a limited typology of major circulation patterns.

Two. In *Histoire du climat* Le Roy Ladurie defined his object of study as 'histoire climatique *séculaire*'—the study of climate change in structural time, the *longue durée*. Such fluctuations would have similar wavelengths, roughly half-centuries to several centuries, as François Simiand's phases A and B, Kondratieff's long waves, and Labrousse's *intradecennial* and secular fluctuations. These are the spans of time that define such protracted events as the price inflation of the sixteenth century or the crisis of the seventeenth century, and obviously if climate change played any major role in their causation it would need to be comparable in frequency and duration. Although extreme weather events of months to several years' duration may represent peaks in longer waves and are therefore of interest, such short frequencies are otherwise excluded from Le Roy Ladurie's jurisdiction, as are climate oscillations on orbital or geological time scales. [74]

In his critique of Utterström's contention that Scandinavian agriculture was besieged almost uninterruptedly by Little Ice Age weather from the 1560s until the 1690s, Le Roy Ladurie lays down a methodological commandment about periodization whose consistent violation continues to muddle contemporary writing about climate change:

> What he must do is show us, by means of rigorous, statistical methods, that these disastrous years resulted from more or less corresponding meteorological conditions, and having done so, he must show that they occurred with exceptional frequency during the long period under consideration, and that they were more or less unknown, or at all events considerably less frequent, in the preceding and ensuing periods. As long as no proof has been given of any significant difference between any two periods, we cannot accept the disastrous years in question as units in a long series, and we are forced to see them as forming only part of short-term meteorological fluctuations . . . What should we say of a historian or of an economist that claimed to show a lasting, long-term rise in prices if he based his argument on a few peaks in the curve he professed to interpret, and neglected or did not even know its general path? . . . By the same reasoning, we shall see that a few remarkably cold winters scattered about the seventeenth century do not, without ampler information, amount to a 'cold seventeenth century'. [75]

Three. Historical climatology must rely on 'purely climatic facts' and continuous time series. [76]Using presumed effects, whether geographical or social, to make claims about causes was the original sin of the old climate history: 'A migration, a famine or list of famines, and still more a graph of agricultural prices are not and cannot be facts that are strictly climatic. Migration results from extremely complex human motives and compulsions. Famine derives from adverse agricultural circumstances in which the climatic element can never be deciphered *a priori*.' [77]

But 'purely climatic facts' before 1700 must either be derived from human observations, treated with great caution, or from natural proxies. With written evidence, 'everything remains to be proved'. In 1959 when he wrote 'Histoire et climat', the historical climatology of the pre-instrumental period consisted largely of hypotheses derived from unreliable documentary accounts or archaeological excavations. Le Roy Ladurie's scepticism about taking written records at their word not only differentiated his approach from the old climate history but also from much of what is still written today. [78] 'Hampered by the shortage of data, research workers dealing with the question were quite often reduced to collating, entirely at random, events which had for various reasons caught the imagination of contemporaries: "terrible" droughts, periods of "dreadful cold", "hard" winters, "torrents" of rain, floods. We can well imagine the subjective, heterogenous, piecemeal, in a word, irrelevant, character of such material.' By the late 1970s Le Roy Ladurie would enthuse over an ingenious method invented by the geographer Christian Pfister in Bern to refine and quantify documentary climate data; but just a decade earlier the only pre-instrumental time series that enjoyed wide credibility was Derek Schove's chronology of annual winter and summer weather in northwestern Europe since 1450. Schove, a schoolmaster with a scientific background, asked only the simple questions that documents could reliably answer: were the winters 'cold' or 'mild'; were the summers 'warm' or 'cool'? [79] The categories were primitive but, as we shall see, they allowed some surprising deductions.

Four. Economic history and climate history face the same challenge when they try to deduce the trend of some variable from the behaviour of another variable: all proxies are over-determined. For instance, Le Roy Ladurie and colleagues in the Sixth Section struggled for years to utilize variations in ecclesiastical tithes as a proxy for trends in agricultural output. This proved a statistical nightmare since the proprietors of these tithes usually sold the collection rights at auction, and the receipts reflected the rental value of the tithe rather than the amount eventually collected. Therefore, tithe trends plotted on a graph could not be assumed to mirror harvest trends without intricate adjustments and corrections.

Likewise the *vendange* (grape harvest) dates on which Le Roy Ladurie based such high hopes as windows into pre-instrumental climate were determined by human decisions about desired crop maturity as well as by the weather conditions during the growing season. If a *vigneron*, for example, aimed for a higher-quality vintage or simply wanted to increase the alcohol content, he would schedule the harvest later than previously. Although Le Roy Ladurie in *Histoire du climat* was confident that the correlation between *vendange* and climate could be accurately used as a thermometer for as long as a generation, he conceded that 'on a secular time scale human factors distort the harvest curve and make it unusable as a climate indicator'. [80]

Le Roy Ladurie, who had a better understanding of parametric methods than most historians in the 1960s, understood the challenge of signal discrimination but underestimated its difficulty. Today very powerful statistical methods borrowed from signal-processing theory, such as principal component and wavelet analyses, are applied to proxy data, and comparisons are often made across scores of different data sets. But apart from the Greenland and Antarctic ice cores, whose analyses enjoy very broad scientific confidence, other pre-instrumental proxy findings are rarely accepted without controversy or the challenge of rival data. Even when the results are robust, the specificity of local conditions may make the data ungeneralizable to the desired geographical scope. Le Roy Ladurie's scepticism about conclusions drawn from a single time series, in other words, remains entirely valid, as does his belief that historians must possess enough scientific literacy to situate the findings of any particular study in its appropriate field of debate. Otherwise every hypothesis will always find the data it needs.

Five. This same complex challenge of distinguishing the superimposed signals of different causalities applies to the other important natural archives. Nearly half of *Histoire du climat*, for instance, chronicles and comments upon glaciological

research, but the stories that the ice tells are surprisingly complex. Every major glacier in the Alps, it turns out, has a distinct behavioural profile determined by its setting and micro-climate. Glacier movements at Chamonix, for instance, are mainly influenced by temperature, but at Grindelwald, by precipitation. Generalizations about regional or continental ice advances and retreats are suspect unless they respect these local eccentricities.

Unsurprisingly, instrumental data demonstrate that recent warming correlates positively with glacial retreat all over the world. But the inverse model, the assumption that glacial advances must have been based on global cooling, 'remains purely theoretical'. Since glaciers accumulate mass through a combination of factors, including mild but wet winters, annual temperatures don't have a simple linear relationship to glacial budgets. Moreover the *glaciological* Little Ice Age, the most indisputable proof of long-term climate fluctuation, is not a reliable witness in the murder trial of the *climatological* Little Ice Age: 'What should we think of a historian who tried, even partly, to explain economic progress in Europe since 1850 by the warming up revealed in the retreat of Alpine and other glaciers since that date? Utterström is doing much the same thing when he tries to establish a close connection between the advance of the glaciers and the economic crises in Europe during the fourteenth, fifteenth and seventeenth centuries.' [81]

Six. Until the great promise of *vendange* chronologies or European tree rings could be realized, Le Roy Ladurie concluded that only the dendrochronological records from the American Southwest met a high scientific standard. The 'Arizona school' of tree-ring research—using Western tree species which were remarkable rain gauges—resolved annual fluctuations in precipitation with unprecedented precision. [82] When the Laboratory of Tree-Ring Research at the University of Arizona identified an almost century-long drought before 1300, followed by extraordinary humidity in the next century, and another mega-drought in the last third of the sixteenth century, they ignited a decades-long debate within the small community of historical climatologists—mainly meteorologists and archaeologists—about whether these large-scale events were confined to the western United States or might be the footprints of global climate changes.

Utterström embraced the latter view, but Le Roy Ladurie was characteristically cautious. Observing that the drought signals faded away at the borders of more humid regions like the Pacific Northwest, he emphasized: 'Geographical differentiation of this kind is important in itself and of a general character; it is quite wrong to apply conclusions valid for arid zones categorically to humid, temperate regions; what is true for Los Angeles is not necessarily true for Portland; in Europe what may be true for the Mediterranean is not necessarily true for countries on the North Sea, much less for the Baltic.' The existence of hemispheric or global climate fluctuations required proof in the old world and elsewhere that was equal in quality to the Western trees: 'American trees cannot be the work of European trees.' [83]

Seven. Thus there is no Rosetta Stone of climate history, even in Arizona: 'We must therefore stop expecting growth-curves of trees to supply us with information about a universal law on the cyclical evolution of climate. Just as with price curves, climatic curves are for the time being purely empirical: it is impossible to deduce them on the basis of a given frequency; they must be established for each individual continent, and for each large region.' The geographical specificity of climate history—unless shown differently—is an axiom in every context. In Europe, for example, agricultural vulnerability differs in character according to the local climate and crop spectrum. Apart from the most extreme and geographically extensive cold spells—such as those rare winters in the Midi that kill olive trees and freeze the sea around ships in Marseilles harbour—and droughts—like the burning summer of 2003—there are three broad latitudinal bands of seasonal hazards. In the Northern European plain, the major threat to the harvest is rain in the late spring and summer; while in the northern Mediterranean basin, drought is the primary worry, especially before the nineteenth century when wheat was a major crop; in Scandinavia and the Baltic

region, it is extreme cold in any season. It was therefore rare to experience simultaneous crop failures in Northern and Southern or, for that matter, Western and Eastern Europe; 1709 was an unusual and catastrophic exception.

In general, the Midi proved to be the *wrong* place to study the Little Ice Age and its human impacts. Not only do northern France and the Mediterranean register different effects from changes in circulation regimes, but their documentary records, as Le Roy Ladurie discovered after the publication of *Histoire du climat*, are dramatically dissimilar in quality:

> The use of computers in the last few years enabled us to sift the enormous mass of records, to separate the wheat from the chaff, the reliable series from the unreliable ones . . . the research group at the Sixth Section of the École pratique des hautes études thus eliminated the series from the south of France: they are inadequate, correlate badly and are the work of observers who were neither keen, conscientious nor scrupulous. On the other hand, some local series from the Paris region, western France and above all the very north (Arras, Montdidier etc.) came through our computer test with flying colours: they show mutual correlation rates exceeding 0.95. They provide a very solid basis for a picture of the climate during the last two hundred years of the *ancien régime*. [84]

Thirty years later in the first volume of his *Trilogy* his analysis of Little Ice Age events accordingly focused on northern France, England and the Low Countries. [85]

Eight. As in China, India and Brazil, crop failure in one region of early modern Europe was often balanced by bumper harvests in another. Thus the warm interlude between extreme Little Ice Age events in the second half of the seventeenth century—roughly 1650 to 1680—produced disastrous droughts in Languedoc and Provence, but exceptional harvests in the Baltic. In *Les paysans de Languedoc*, Le Roy Ladurie speculated that these unexpected grain surpluses glutted the market in Amsterdam and central Europe leading to a price collapse that may have initiated the broad recession that Simiand characterized as the B phase of deflation and stagnation. [86] But delivering grain from a surplus region to a deficit region, whether or not markets were involved, obviously depends upon the existence of transportation infrastructures. In the seventeenth century, China was unique in a double sense because of the Qing dynasty's commitment to relieve famine, and the centuries of investment that had dug the Grand Canal—one of the Earth's greatest public works—to move emergency rice and millet from the Yangtze to the Yellow River plain, while the famous 'ever-normal granary' system promised immediate relief—*faire la soudure*—until southern shipments arrived. In Europe, with few exceptions, only maritime hinterlands, river corridors and areas of advanced mixed agriculture were protected from famine by the grain trade or alternative crops. Interior regions as well as highland peripheries remained highly vulnerable to crop failure until the road and canal boom of the eighteenth and early nineteenth centuries. For Languedoc, the construction of the Canal du Midi—by speculators, not the government—in the later seventeenth century was the beginning of market unification and a secure grain supply, although isolated and autarkic enclaves remained until the Third Republic.

Nine. Agricultural systems, especially crop spectrums and water storage, shape vulnerability to bad weather. England, the first large country to break the cycle of crop failure and famine in the seventeenth century, had the advantage—thanks to sufficient fodder crops—of abundant animal power to plough and provide fertilizer for both spring and winter grains. Across the channel, however, spring-sown crops were neglected because there were too few draft animals and cattle to manure two annual sowings. The shortage of plough horses also meant that farmers in northern France could seldom plough as deeply or frequently as in England. Thus the traditional

epicentres of climate-induced famine in France were the northern plains from Paris to Beauvais and the Loire Valley. Scotland and Scandinavia shared the French predicament of a dangerous dependence upon a single harvest, although in these northern cases spring rather than winter grains were the basis of subsistence.

'The secret in avoiding famine', according to Andrew Appleby, was in a seasonally 'balanced agriculture, with wheat and/or rye constituting an important bread grain, but with adequate oats and barley to fall back on in times of scarcity'. [87] Bas-Languedoc in the eighteenth century offers an extraordinary example of turning bad weather into good weather by substituting heat-and-drought adapted species for temperate crops. The old agricultural economy of the region, as we have seen, was based on grain and thus highly vulnerable to the 'series of implacable summers', 'imperialist anticyclones, that for five and ten years, sometimes longer, reigned over France with abnormal frequency' during the seventeenth century. After 1700, however, there was widespread conversion of wheat fields to vineyards and subsistence to semi-commercial production. The hot dry months that burnt up grain were a blessing to the vines, and heat waves after 1700 began to produce episodic crises of overproduction rather than dearth. [88]

Ten. The basic statistical unit of climate history is not annual temperature, but monthly or seasonal temperature *and* precipitation. Annual records conceal crucial seasonal anomalies that may represent essentially different weather regimes. Tree rings and grape-harvest dates only reflect weather conditions during the spring–summer growing seasons, so in order to retrieve information about winter climate Le Roy Ladurie turned to Schove's seasonal chronology. The results were very surprising: summer temperature variations balanced each other out to produce net stability in the sixteenth century, while winter weather showed an abrupt decline in stability and temperature from 1540 onwards: 'At first sight, one is somewhat surprised and even sceptical faced with this fundamental discordance of scale between the summer series, with their relatively short fluctuations and their secular stability, and the winter series prone to wide secular oscillations, even inter-secular.' [89] The explanation for this striking seasonal asymmetry, Le Roy Ladurie suggests, is that Northern European climate can shift between two characteristic regimes: a milder *maritime* circulation as in the first half of the sixteenth century; and a more extreme *continental* pattern as during the second half of the sixteenth century. The maritime regime is associated with mild, somewhat rainy winters and warm summers; while the continental regime brings almost Russian winters and sometimes very hot summers. The first represents a strong latitudinal flow of low-pressure systems across the Atlantic, while the second is the result of the high-pressure blocking of maritime weather that exposes Western Europe to a meridional circulation that brings the invasion of Arctic air masses.

Eleven. The oscillation between the two patterns, as well as the corresponding existence of an air pressure see-saw between the Icelandic Low and the Azores High—dubbed the North Atlantic Oscillation by Gilbert Walker in the 1920s—had been recognized since the late nineteenth century but lacked a theoretical explanation until the emergence of 'dynamic meteorology' after the Second World War. The modern theory of mid-latitude weather was worked out in three stages by Scandinavian scientists: first, Jacob Bjerknes's 1904 paper giving meteorology a theoretical foundation in fluid mechanics and thermodynamics; second, the revolutionary concepts of the polar front and cyclogenesis developed by Bjerknes, his son and students in Bergen during World War One; and third, the discovery of planetary standing waves and the role of jet streams by Bjerknes's former student Carl-Gustaf Rossby and his colleagues at the University of Chicago in the 1940s. [90]

One of the early apostles of Rossby in France was the geographer-meteorologist Pierre Pédelaborde whose 1954 textbook—still in print fifty years later—and 1957 doctoral thesis on the climate of the Parisian basin introduced dynamic meteorology to geographers and historians without requiring them to master the complex differential equations that made Rossby's canonical articles a headache even for scientists. [91] In an article that much influenced Le Roy Ladurie, indeed became a

scientific foundation of *Histoire du climat*, Pédelaborde argued for the temporal invariance—today it would be called fractality—of climate fluctuations across different scales of human and even geological time: 'Decadal oscillations and century-scale cycles only differ by their amplitude and duration, and appear to be linked by the same processes within the general circulation.' [92]

In Pédelaborde's view there were two (and only two) fundamental modes of global climate variability, both involving displacements of the principal planetary zones of circulation and defined by their antipodal 'zonality'. The first was characterized by the expansion of tropical convection and jet streams toward the poles, and the increased sinuosity of the paths of westerly moving cyclones in the temperate and sub-arctic latitudes. In the second case there was an equatorward contraction of tropical rainbelt—the Intertropical Convergence Zone (ITCZ)—and an acceleration of the movement of low-pressure cells across the Atlantic. The first mode characterized interglacial periods in Quaternary time while the second was the base meteorology of the much longer Ice Ages. Weaker versions of the same oscillation operated on millennial and centennial time-scales: 'The essential fact here is the existence of two types of circulation'—'the alternation between the two enables us to explain *the variation of climate onevery scale and in every age*'. [93]

This is a curious statement since presumably the two circulation regimes are only the *forms* of variable circulation not its causes. Moreover, there are two different ways that this bimodal oscillation might be generated. In one scenario, 'the intertropical convergence zone migrated north–south away from the colder hemisphere' or 'it contracted and expanded symmetrically around its present position'. Both positions have contemporary advocates. [94] In any event, as a leading Canadian meteorologist later pointed out, 'the notion of the general circulation switching back and forth between modes of variability—low and high zonal indices—did not catch on, and the 1950s saw a general decline of interest in the index cycle as a medium-range forecasting tool.' [95] Indeed Pédelaborde later clarified that 'the zonal and meridional circulations only represent the *resultants* of entirely more complex processes.' The essential fact about Western European climate is 'the extreme fragmentation of the atmosphere, which is what entrains the caprices of the circulation'. Because Western Europe is a battlefield for weather coming from elsewhere—westerly flow, polar invasions, subtropical warmth when the Azores High moves northward, and so on—the 'two circulations' are really just a first-order abstraction. Climatologists continue to debate how many synoptic ideal-types—4, 9, 10 or even 29—are required to classify the diversity of European weather systems. [96]

Twelve. Le Roy Ladurie, however, did recognize that the bold ideas of the new climatology—at least the late-1950s version—fail in the end to explain the agricultural impacts of the Little Ice Age. Schove's data manifest a long-wave pattern only in winter temperatures. Very cold winters may kill people and livestock, but outside of Scandinavia where normal winter temperatures are already very low to start with, they spare cereal crops insulated under snow. Indeed good wheat harvests require cold winters. On the northern 'French steppe' the real danger to cereals, as we've seen, is a cool, rainy growing season, spring through summer. It was thus premature to deduce too much from work like Pédelaborde's until an adequate meteorological record—ideally monthly precipitation data—existed. 'Summing up', Le Roy Ladurie said in 1959, 'one cannot prove that the continentalization' of weather in the seventeenth century had 'depressed the agricultural economy of Europe'. [97]

But he vacillates over the reality of a Little Ice Age, as have many climate scientists in recent decades. [98] 'Is it true, as Schove avers, that the predominance of cold periods and their accumulation is an "age" spanning several centuries?' He accepts that American tree-ring data show 'a long but weak oscillation' but judges it 'without importance to men's lives'—an opinion that oddly contradicts his belief that the American Southwest suffered civilizational disaster during megadroughts. In any event, he rejects the idea of a general climate-related catastrophe in the Baroque age, pointing out that the economic and demographic crises do not conform with the

period's meteorology in any consistent multi-decadal pattern: 'The crisis of the seventeenth century, always presented as the historical climax of the Little Ice Age, in fact experiences its paroxysms in periods of climatic remission when maritime influence has temporarily displaced the continental influence.' Yet if climate change doesn't coincide with long-term economic crisis on the century level, it has decisive impacts on particular decades. 'The failed harvest of 1693', he writes in *Histoire du climat*, 'caused an apocalyptic, medieval-type dearth which killed millions of people in France and the neighbouring countries. No historian of the seventeenth century in France will say I exaggerate.' Elsewhere he claims that 'the biggest crises of the seventeenth century, the Fronde and 1690–1700 were without a doubt provoked by a series of unfavourable climatic and ecological years'.

These, then, were the conceptual starting points, methodological guidelines, empirical-intellectual cautions and provisional, much qualified conclusions against which Le Roy Ladurie's monumental *Trilogy* may be read.

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[1] Lynn Hunt, 'French History in the Last Twenty Years: The Rise and Fall of the *Annales* Paradigm', *Journal of Contemporary History*, vol. 21, no. 2, April 1986, p. 215.

[2] Referring to the collapse of student interest in quantitative history: 'I think 1968 was a disaster, from my point of view'—'young people are no longer interested in all those statistics'. 'Immobile History: An Interview with Emmanuel Le Roy Ladurie', in Alexander von Lunen and Charles Travis, eds, *History and* GIS*: Epistemologies, Considerations and Reflections*, Dordrecht 2013, p. 18.

[3] Guy Lemarchand, Emmanuel Le Roy Ladurie and Karine Rance, 'Regards croisés', *Annales historiques de la Révolution française*, no. 351, 2008. Le Roy Ladurie has always distinguished between anti-communism (of which he is a militant advocate) and anti-Marxism (which he rejects). In his memoir *Paris–Montpellier: PC–PSU, 1945–1963*, Paris 1982, which recounted his passage through the postwar French left, he defended Marxism as an indispensable 'analytic and descriptive tool', not least in its capacity 'to demystify regimes which proclaim themselves officially Marxist': p. 34. He also happily conceded that the *Annales* school shared 'old Karl's belief in a socio-economic infrastructure to history', but without the 'dogmatic preoccupations of his disciples': p. 224.

[4] Arguably there is a third 'grand project', although coming much later in his career: the history, both anthropological and political, of the absolutist court.

[5] 'The paratrooping truffler', *Times Higher Education Supplement*, 12 October 1998.

[6] 'An Interview with Jacques Le Goff', *Historical Reflections/Réflexions Historiques*, vol. 21, no. 1, Winter 1995, p. 160.

[7] Hunt, 'French History in the Last Twenty Years'.

[8] The metaphor is Eric Hobsbawm's. Responding to Lawrence Stone's charge that historians were abandoning social theory for narrative, Hobsbawm pointed instead to the 'remarkable widening of the field of history in the past twenty years', and he specifically rejected the idea that *Les paysans de Languedoc* and *Montaillou* represented opposed forms of historical discourse: 'So long as we accept that we are studying the same cosmos, the choice between microcosm and macrocosm is a matter of selecting the appropriate technique. It is significant that more historians find the microscope useful at present, but this does not necessarily mean that they reject telescopes as out of date.' 'The Revival of Narrative', *Past and Present*, no. 86, February 1980, pp. 5, 7.

[9] To be precise, he 'discovered' Jean Duvernoy, a local scholar, who had already published the three volumes of interrogations in Latin conducted by Jacques Fournier, later Pope Benedict XII. For Le Roy Ladurie's rather bashful account of how he came to receive most of the credit for the discovery: 'Immobile History', p. 19.

[10] Le Roy Ladurie, 'Response to Laurence Brockliss', *Reviews in History*, July 2009.

[11] Le Roy Ladurie, 'En Haute-Normandie: Malthus ou Marx?', *Annales*, vol. 33, no. 1, 1978.

[12] Le Roy Ladurie, 'A Reply to Robert Brenner', in Trevor Aston and Charles Philpin, eds, *The Brenner Debate: Agrarian Class Structure and Economic Development in Pre-Industrial Europe,* Cambridge 1985, pp. 101–6.

[13] Le Roy Ladurie, *L'État royal, 1460–1610*, Paris 1987 (*The Royal French State, 1460–1610*, Oxford 1994); *L'Ancien Régime 1610–1770*, Paris 1991 (*The Ancien Régime: A History of France, 1610–1774*, Oxford 1991).

[14] William Doyle, 'Review: *The Ancien Régime*', *English Historical Review*, vol. 113, no. 452, June 1998, p. 739.

[15] Laurence Brockliss, 'Review of *The Ancien Régime*', *Reviews in History*, July 2009. Note that both the book review and Le Roy Ladurie's response were published 19 years after the release of the original French edition—talk about 'slow history'!

[16] Le Roy Ladurie, *The Ancien Régime*, p. 473.

[17] Le Roy Ladurie, however, no longer considers the polarity right/left to be very meaningful. Instead he and some other former left intellectuals have purloined Karl Popper's *The Open Society and Its Enemies* to create a new binary opposition of opening/closure where 'ouverture' is both a synonym for liberalism (the fall of Communism) and/or for tolerance (the Edict of Nantes). This semantic trick allows Henri-Quatre and Gorbachev to sing in the same celestial choir. See Le Roy Ladurie, ed., *Ouverture, Société, Pouvoir*, Paris 2005.

[18] Le Roy Ladurie, *Histoire humaine et comparée du climat, Vol. I. Canicules et glaciers, XIIIe–XVIIIe siècles,* Paris 2005; *Vol. II. Disettes et révolutions, 1740–1860*, Paris 2006; *Vol. III. Le réchauffement de 1860 à nos jours*, Paris 2009. *Les Fluctuations du climat de l'an mil à aujourd'hui*, Paris 2011, is both a synopsis of the *Trilogy* and a substantive update. Thus it might be more accurate to refer to a trilogy and a half.

[19] Emmanuel Garnier, 'Fausse science ou nouvelle frontière? Le climat dans son histoire', *Revue d'histoire moderne et contemporaine*, no. 57, 2010, p. 7. Jean-Yves Grenier, an economic historian at the École Polytechnique, denied the possibility of reconstructing meteorologies before 1700: *L'Économie de l'Ancien Régime,* Paris 1996, pp. 279–86.

[20] Guy Lemarchand, 'Une histoire de l'essentiel: le climat et les récoltes', *Annales de Normandie*, vol. 57, no. 1–2, 2007, p. 192.

[21] 'History That Stands Still' ['L'Histoire immobile'], in Le Roy Ladurie, *The Mind and Method of the Historian*, Chicago 1981 (selections from *Le territoire de l'historien*, vol. 2, Paris 1978).

[22] Lemarchand et al., 'Regards croisés', *passim*.

[23] This is disingenuous. See, for example, his praise for Furet's attacks on the revolutionary tradition in *The Ancien Régime*, p. 473.

[24] Lemarchand et al., 'Regards croisés', pp. 178–81.

[25] On this issue, Le Roy Ladurie is indeed the better Marxist. In his critique of political economy, Marx simultaneously attacked theories of value that reified capital's capacity for self-movement by denying the natural substrate of production, and the mirror-image pessimism of economists who feared that finite resources—arable land in the case of Ricardo, coal for Jevons—posed ultimate limits to accumulation. Nature, including climate, in *Capital* is thus the coequal source, with concrete labour, of use-value, but merely a relative constraint on the expansion of exchange-value. But it is clearly a force of production in any mode of production. In *The German Ideology*, Marx and Engels had stressed that they knew 'only a *single science*, the *science of history*. One can look at history from two sides and divide it into the history of nature and the history of men. The two sides are, however, inseparable; the history of nature and the history of men are dependent on each other as long as men exist.' *Marx–Engels Collected Works*, volume 5, London 2010, p. 28.

[26] Wally Seccombe, *A Millennium of Family Change*, London and New York 1995.

[27] A complete bibliography up to 2011 of Le Roy Ladurie's research and writing on climate history is available on the website of the Bibliothèque nationale de France: www.bnf.fr/documents/biblio_leroy_ladurie_climat.pdf.

[28] Le Roy Ladurie, 'Histoire et Climat', *Annales*, vol. 14, no. 1, 1959 ('History and Climate', in Peter Burke, ed., *Economy and Society in Early Modern Europe: Essays from the* Annales, London 1972, p. 138).

[29] Le Roy Ladurie, 'Le climat des XIe and XVIe siècles: séries comparées', *Annales*, vol. 20, no. 5, October 1965, p. 918.

[30] My emphasis: Le Roy Ladurie, *Times of Feast, Times of Famine: A History of Climate Since the Year 1000,* Garden City, NY 1971, p. 18 (revised translation of *Histoire du climat depuis l'an mil*, Paris 1967).

[31] 'Proxy indicators represent any piece of evidence that can be used to infer climate. Typically, proxies include the characteristics and constituent compositions of annual layers in polar ice caps, trees and corals; material stored in ocean and lake sediments (including biological, chemical and mineral constituents); records of lake levels; and certain historical documents': Soroosh Sorooshian and Douglas Martinson, 'Proxy Indicators of Climate', in *Natural Climate Variability on Decade-to-Century Time Scales,*Washington, DC 1995, p. 490.

[32] Pierre Daix, *Braudel*, Paris 1995, p. 365. Daix provides a fascinating account of the successive impacts of the structuralism of Althusser, Lacan and Foucault, followed by May 1968, upon the 6th Section of the École pratique des hautes études.

[33] Le Roy Ladurie, *Times of Feast*, pp. 20, 22.

[34] Fernand Braudel, 'The Situation of History in 1950', in *On History*, Chicago 1980.

[35] Le Roy Ladurie, *Territoire de l'historien*, vol. 1, Paris 1973, p. 423. In a 1984 interview Braudel rejected the idea of the 'total immobility' of peasant history, pointing out that this was not his concept of the *longue durée*—borrowed from Marx—as the activity of structures that would one day break up or mutate: see Daix, *Braudel,* pp. 454–5.

[36] Stuart Clark, ed., *The Annales School: Vol. 4—Febvre, Bloch and Other Annales Historians,* London 1999, p. xii.

[37] François Dosse, *New History in France: The Triumph of the Annales*, Urbana, IL 1994, p. 159 (*L'histoire en miettes: Des 'Annales' à la 'nouvelle histoire'*, Paris 1987).

[38] Le Roy Ladurie, *Naissance de l'histoire du climat*, Paris 2013, p. 45.

[39] Emmanuel Garnier claims that Le Roy Ladurie rejected 'the idea of a linkage between climate change and socio-economic evolution' because of his adherence to 'a version of Marxism that believes that the "infrastructures" of a mode of production only encompass social relations and material production': 'Fausse science ou nouvelle frontière?', p. 9. But Le Roy Ladurie, aside from being explicit about the two types of *histoire du climat,* would hardly embrace the same idea—the exclusion of natural dynamics from productive forces—that he was roundly criticizing.

[40] Le Roy Ladurie, *Times of Feast,* pp. 292–93, 20–22. The 1 C° range remains the most accurate estimate of the variance.

[41] Le Roy Ladurie, *Abrégé d'histoire du climat,* Paris 2007 (rev. edn: *Trente-trois questions sur l'histoire du climat: du Moyen Âge à nos jours*, Paris 2010); *Les Fluctuations du climat,* Paris 2011; *Naissance de l'histoire du climat*, Paris 2013.

[42] Anouchka Vasak, Preface to *Naissance de l'histoire du climat*, p. 13.

[43] Le Roy Ladurie, *Naissance de l'histoire du climat*, pp. 23–79.

[44] Robert Paxton, *French Peasant Fascism: Henry Dorgères's Greenshirts and the Crises of French Agriculture, 1929–1939*, New York 1997, p. 130 ff.

[45] Gordon Wright, *Rural Revolution in France: The Peasantry in the Twentieth Century*, Stanford 1964, p. 77.

[46] Anthony Rowley and Emmanuel Le Roy Ladurie, eds, *Jacques Le Roy Ladurie: Mémoires, 1902–1945,* Paris 1997.

[47] Le Roy Ladurie, *Paris–Montpellier: PC–PSU*, p. 34. He became close friends with the sinologist Jean Chesneaux, also drawn to the PCF by the Chinese revolution.

[48] Le Roy Ladurie, *Paris–Montpellier: PC–PSU*, p. 75.

[49] Daix, *Braudel*, p. 289.

[50] *Paris–Montpellier: PC–PSU*, pp. 117–9. Le Roy Ladurie observes that little of Marx's work, apart from the *Manifesto*, was actually read by PCF members. Stalin and Lenin were the bestsellers (probably universally true in the Communist movement).

[51] Ernest Labrousse, *Esquisse du mouvement des prix et des revenus en France au XVIIIe siècle*, 1933 thesis; and *La Crise de l'économie française à la fin de l'Ancien Régime et au début de la Révolution*, Paris 1990, p. 3.

[52] Le Roy Ladurie, *Naissance de l'histoire du climat*, p. 3.

[53] Montpellier in the late 1950s was also an episodically dangerous environment for outspoken opponents of the Algerian War like Le Roy Ladurie and his wife Madeleine (who stayed in the PCF until 1963). The university was a notorious hotbed for right-wing, pro-*colon* student groups linked to the hardliners in Algiers who later formed the Secret Army Organization and tried to assassinate de Gaulle.

[54] William Beik, *Absolutism and Society in Seventeenth-Century France: State Power and Provincial Aristocracy in Languedoc,* Cambridge 1985, p. 34.

[55] Fernand Braudel, 'Personal Testimony', *The Journal of Modern History*, vol. 44, no. 4, December 1972, p. 466.

[56] Lucien Febvre, *Philippe II et la Franche-Comté* [1912], Paris 1970, p. 7.

[57] Despite Braudel's occasional misgivings: 'I hope that young French historians avoid futile projects like those of Vidal de La Blache's leading disciples who studied the different regions of the French mosaic one after another. It's not the bailiwick, nor the *pays*, nor the region, still less the department in the most recent periods that are the true framework of research. But the *problem*'; reviewing Goubert's *Beauvais et le Beauvaisis de 1600 à 1730* in *Annales*, vol. 18, no. 4, July–August 1963, p. 778.

[58] Philip Whalen, *Gaston Roupnel: âme paysanne et sciences humaines*, Paris 2001.

[59] 'Immobile History', p. 17.

[60] Le Roy Ladurie, 'Voies nouvelles pour l'histoire rurale (XVIe–XVIIIe siècles)', *Annales*, vol. 20, no. 6, November–December 1965, p. 1268.

[61] Le Roy Ladurie, 'Recent Historical "Discoveries"', *Daedalus*, vol. 106, no. 4, 1977, p. 144.

[62] Pierre Goubert, *Beauvais et le Beauvaisis de 1600 à 1730* [1960], Paris 1982.

[63] René Baehrel, *Une croissance: La Basse-Provence rurale de la fin du seizième siècle à 1789* [1961], Paris 1988.

[64] Le Roy Ladurie, 'Les masses profondes: la paysannerie', in *Histoire économique et sociale de la France*, vol. 2, Paris 1977 (*The French Peasantry 1450–1660*, Berkeley 1987, p. 278).

[65] Pierre Vilar, *La Catalogne dans l'Espagne moderne: Recherches sur les fondements économiques des structures nationales*, 3 vols, Paris 1962. For the contrast between the dynamism of Catalonia and the decline of Castile, see his 'The Age of Don Quixote', NLR 1/68, Jul–Aug 1971.

[66] Le Roy Ladurie, 'Quantitative History: The 6th Section of the École pratique des hautes études' [1967], in *The Territory of the Historian*, Chicago 1979, pp. 24–5.

[67] Le Roy Ladurie, review of Albert Soboul, *Les Campagnes montpelliéraines à la fin de l'Ancien régime*, *Annales historiques de la Révolution française*, vol. 3, 1961.

[68] Le Roy Ladurie, 'Histoire et climat'; 'Climat et récoltes aux XVIIe et XVIIIe siècles', *Annales*, vol. 15, no. 3, 1960; and 'Aspects historiques de la nouvelle climatologie', *Revue historique*, vol. 225, no. 1, 1961. Their revised content is recycled in different sections of *Histoire du climat*.

[69] Le Roy Ladurie, 'Histoire et climat', p. 3.

[70] Gustaf Utterström, 'Climatic Fluctuations and Population Problems in Early Modern History', *Scandinavian Economic History Review*, vol. 3, no. 1, 1955, p. 3.

[71] For example, a memoir by a vicar, born in 1622, referring to climate events of the late 1590s recollected by his family. Utterström, 'Climatic Fluctuations', p. 32: 'This has the usual weakness of hearsay evidence and the chronology is somewhat uncertain. But there is no reason to doubt the reality of the facts contained in it.' Facts?

[72] Le Roy Ladurie, 'Histoire et climat', p. 6.

[73] Pierre Pédelaborde, *Introduction à l'étude scientifique du climat* [1954] Paris 1991, pp. 22–3.

[74] See Nicholas Clifford and John McClatchey, 'Identifying the Time-Scales of Environmental Change', in Thackwray Driver and Graham Chapman, eds, *Time-Scales and Environmental Change*, London 1996.

[75] Le Roy Ladurie, 'Histoire et climat', p. 137.

[76] 'The point of departure of such a study must not be the weather event, isolated, often ambiguous, but—as continuous as possible—a homogenous climatic data series. Nevertheless the conclusions furnished by such a series, however valuable in themselves, are in their turn unilateral. A useful synthesis can't arise from the simple confrontation of data sets': Le Roy Ladurie, 'Climat et récoltes', p. 434.

[77] Le Roy Ladurie, *Histoire du climat*, p. 17.

[78] Pre-instrumental reports of extreme winters, for example, are often interpreted as cold years, when in fact a warmer-than-usual summer could balance the annual mean. Before the mid-18th century, moreover, every wind above force 4 was recorded as a 'gale', afterwards a force 5 was officially a 'fresh breeze'. And the frozen 17th-century Thames with its famous 'frost fairs' has been universally evoked as an illustration of the extremity of the Little Ice Age, but the freezes are now understood to have been caused by the old London Bridge acting as a weir and preventing the tide from coming upstream. After 1830 when the Bridge was demolished and salt water again flowed past Westminster, the Thames no longer froze even in the coldest winters. See Phil Jones and Michael Mann, 'Climate Over Past Millennia', *Reviews of Geophysics*, vol. 42, no. 2, June 2004, pp. 6–7.

[79] Le Roy Ladurie, 'Histoire et climat', pp. 134, 158–60.

[80] Le Roy Ladurie, *Les paysans de Languedoc*, Paris 1966, p. 29. Alain Guerreau, critical of Le Roy Ladurie, emphasized 'the dates of the grape-harvest should be considered as information about how wine-growers utilized climate and reacted to its variation, rather than as a simple index of climate change.' His conclusion: 'it has become increasingly apparent that the harvest dates can teach us only mediocre lessons about climate trends': Le Roy Ladurie, 'Climat et vendanges', *Histoire & Mesure*, vol. 10, no. 1–2, 1995, pp. 90–1, 145.

[81] Le Roy Ladurie, *Histoire du climat*, pp. 10–11.

[82] After a visit to the University of Arizona in 1968, Le Roy Ladurie proclaimed that 'the work that has been done in the last fifty years in the palaeoclimatic laboratories of Tucson, in the peaceful university city overlooked by the Santa Catalina mountains, is, from the point of view of the science of climate, of history, and of the Earth, one of the great intellectual adventures of the twentieth century': *Histoire du climat*, p. 40.

[83] Le Roy Ladurie, 'History and Climate', pp. 143–4.

[84] Le Roy Ladurie, 'The History of Climate', in Jacques Le Goff and Pierre Nora, eds, *Constructing the Past*, Cambridge 1985, p. 84 (selected essays from *Faire de l'histoire*, 3 vols, Paris 1974).

[85] Contemporary refinements of pre-instrumental time-series employ as many as nine categories to classify seasonal weather. The Dutch are particularly blessed with fine-grained data since the dates of the freezing of canals and water-ways, along with ice conditions and melts, have been fastidiously recorded since the Middle Ages. Since 1992, the Royal Netherlands Institute of Meteorology has published eight volumes—about 5,000 pages altogether—documenting the country's weather history since the year 1000.

[86] Le Roy Ladurie, *Paysans de Languedoc*, p. 36.

[87] Andrew Appleby, 'Grain Prices and Subsistence Crises in England and France, 1590–1740', *Journal of Economic History*, vol. 39, no. 4, December 1979, pp. 883–5.

[88] Le Roy Ladurie, *Paysans de Languedoc*, p. 38.

[89] Le Roy Ladurie, 'Histoire et climat', p. 28.

[90] Achieved through a daring simplification: Rossby ignored the thermodynamic aspects of circulation to focus on the mechanical (hydrodynamic) forces driving large air masses.

[91] Pierre Pédelaborde, *Le climat du bassin parisien*, 2 vols, Paris 1957.

[92] Pierre Pédelaborde, 'Introduction à l'étude scientifique du climat', *L'information géographique*, vol. 21, no. 4, 1957, pp. 153.

[93] Pédelaborde quoted in *Histoire du climat*, p. 277.

[94] Jennifer Arbuszewski et al., 'Meridional shifts of the Atlantic intertropical convergence zone since the Last Glacial Maximum', *Nature Geoscience*, vol. 6, no. 11, 2013, p. 959.

[95] The zonal index was created by Rossby in 1939: Lionel Pandolfo, 'Observational Aspects of the Low-Frequency Intraseasonal Variability of the Atmosphere in Middle Latitudes', *Advances in Geophysics*, no. 34, San Diego 1993, pp. 123–4.

[96] Mait Sepp and Jaak Jaagus, 'Frequency of circulation patterns and air temperature variations in Europe', *Boreal Environmental Research*, vol. 7, no. 3, October 2002, pp. 273–5.

[97] Le Roy Ladurie, *Histoire du climat*, p. 145.

[98] Le Roy Ladurie, 'Histoire et climat', p. 22. He discounts the search for environmental oscillations resulting from sunspots and other astronomical cycles: 'Such researches are to the real history of climate what the philosopher's stone was to oxygen.' *Histoire du climat*, p. 11.