

The emergence of early modern Commons:

Technology, Heritage and Enlightenment

*By Antonio Lafuente & Nuria Valverde **

Our age is rediscovering the importance of commons. Every day we see items in the press directly or indirectly claiming the status of commons for the air, water, the oceans, biodiversity, software and even science itself. And indeed many of the problems facing us are so huge or so complex that they cannot be dealt with on a national basis, but require commitment on a plurinational or even planet-wide scale. Such is the case with CO₂ emissions, AIDS, or Genetically Modified Organisms.

Our subject, however, is not the society of risk but *commons*, that feature of consuetudinary law that has re-emerged from the past and is now claiming our attention. This is hardly surprising, for our world urgently needs to extend common property: that is, those legal entities that are available to all and belong to no one – not even the state. But

* History Institute, Spanish Council of Scientific Research.



let us not be hasty – for the moment, it is sufficient to state that to the old tension modernity introduced between private and public, between state and market, we must now add a third element – commons. Public administration is no guarantee of the adequate management of common property, proof of which, among many other examples, is the disastrous environmental situation in the former Soviet bloc.¹ In any case, the questioning of public property does not necessarily imply the favoring of private property, unless we ignore the possibility of widening the public domain by means of removing some goods from state control and passing them to civil society.²

The casuistry of the reasoning may be complicated, but all the cases quoted above have one thing in common, since we are talking of objects that evolve from the interaction of our environment and our technology. Obviously America existed before it was discovered by Columbus, but it is equally true that as from that year of 1492 its existence, like

¹ Rachel Carson in her famous, *Silent Spring* (New York: Houghton Mifflin, 1962), depicted the conflict between the environment and industrial corporate interests, denounced the abuses permitted by the capitalist system, and advocated a culture of public regulation. M. Goldman's influential book, *The Spoils of Progress: Environmental Pollution in the Soviet Union* (Cambridge: MIT Press, 1972), made it clear that the disaster was much worse in the so-called socialist states. Later literature has brought more arguments in favor of policies that, as well as limiting state prerogatives, are also less liberal. Also, D. J. Peterson, *Troubled Lands: The Legacy of Soviet Environmental Destruction* (Boulder: Westview Press, 1993).

² The 'Tragedy of the Commons' is simply a failure of management on the part of those who have been unable to limit their individual rights in order to protect the collective good. G. Hardin, "The Tragedy of the Commons", *Science*, 162 (1968): 1243-1248. See also the revision of his first determination to recommend private management of common property in, G. Hardin, "Extensions of 'The Tragedy of the Commons'", *Science*, 280 (1998): 682-83.

that of Oxygen in 1777, the hidden sources of the Nile in 1858, or the DNA molecule in 1953, acquired a status of a completely new and conclusive character. America, as well as Oxygen, the Nile and DNA became laboratory specimens, objects that could be mobilized by means of maps, formulae and tables. In other words, objects that, without detriment (either then or now) to their importance for human life (or culture), were destined to be the object of great and controversial experiments, whose solution required the cooperation of more experts and new technologies.

The same is true of Michelangelo's frescos, the manuscripts of Qumran or the bones of the child of Lake Turkana that, once appreciated by archaeologists or paleontologists, become objects bearing witness to a past that can only be studied using sophisticated technologies and specialized language.³ Let us now see these technologies at work.

Technology and consensus

Examining is very simple. It consists of detecting singularities where apparently all is continuously uniform or chaotic. What matters is how we do it and how we evaluate

³ Let us imagine it was found necessary to restore Velazquez's *Las Meninas*. The move would come up against several groups of defenders, each with their own different orthodoxies, ready to fight tooth and nail to prevent anything being changed beyond mutually agreed limits. The question, of course, is who accepts the agreements (and how, and where) that cannot be altered, and how to evaluate any deviations from the doctrine. These questions lead us inevitably to answers favoring the use of one machine over another, or in other words, preferring one methodology to its alternatives.

things. And, while admitting it is not an easy question, we will venture an answer. It is enough to take an object (social, cultural, material or natural) and to assign it some features, characteristics or properties (local, symbolic, physical or formal), that are tangible according to some discipline (history, archaeology, ethnology, astronomy or botany). If the correspondence between the chosen object, its supposed properties and the disciplines applied is correct, then we have made a gigantic step forward, so long as what we sought to do was to inform and shape the object: in other words, to do things with it such as to measure, date, catalogue, compare, or mix it, etc. And we can see how complicated this process becomes, for these are practices that require ever more sophisticated technologies, from the most accessible scales or tables to the rarest balances or numerical series. The technologies of inscription are very diverse, and all imply the use of more or less obvious catalogues, cartographies, algorithms, machines, perspectives or scales. Thus we reach a first deduction: that each object reduced to or circumscribed by a handful of properties needs to be taken care of, and none can survive without the metonymic and disciplinary practices with which it was first brought to light and then established.

So, water does not need us. But H₂O could not survive without an army of chemists, doctors and engineers to recreate it constantly in their laboratories, their books, their plans or their projects. The explanation is simple: for while parsley is the fruit of evolution, *Petroselinum sativum* is the brainchild of the botanist, as the balance of payments is to the economist, Quipus to the anthropologist, and the current of El Niño to the geographer. All these objects are scientific

creatures, bearing no relation to the existence of primitive or sullied nature. None of these objects is natural; they cannot exist without inventiveness and dexterity. They are artificial and among themselves they weave the fabric of what we call reality, including the periodic table, the explanations of the tides, of fever or of species, not forgetting the theories of error, of combustion, of colors and of value; they form an artificial milieu, created by the concurrence of all our technologies ranging from encyclopedias to statistics, passing through classificatory principles, electrolytic cubes and astronomical tables.

The concept of reality, however, has become too elusive. And anyone determined to maintain the existence of a stable, shared, consistent and universal reference faces the challenge of explaining how we acquired this heritage and how it was able to expand its dominion to such an extent. We shall not repeat the arguments discrediting the tendency to exchange nature for reality. The two things are not equivalents, however hard we may try to naturalize cultural imagery, or however stubbornly we strive to maintain the duality between subject and object. We shall add just one more comment on this point: reality carries such weight in our political and moral imagery because it is always expressed with quantitative factors, proving the existence of a broad consensus on its dimensions and how they are to be calibrated. The strange thing, however, is the enormous effort made by our institutions to suggest that values derive from natural principles and not from a rapport between people and their machines. It is of course true that reality and facts are the same thing, but the problem arises when we wish to discri-

minate between facts and opinions. The introduction of these nuances brings out the experts and all the paraphernalia of gadgets that they use to read the pulse, to take stock, and to draw up genealogies.

No society can survive without some agreements to give a certain stability to its more fragile structures. So nobody denies that values are important, but if there were a group of people with the will to understand each other, opposed to capriciousness and in favor of precision, they would first have to agree on the meaning of these words. We know, too, that they would almost certainly end up arguing about measurable and quantifiable matters, and so would need to decide which machines to use and the protocols needed to order and then communicate the information obtained. In short, they would have to obtain technologies able to dissociate the phenomena from the back yard, from the village, and from ethnic links. So a conversation about values ends up as a debate about screws and adjustments, the calibration of instruments or the distortion of lenses. The important thing in these technologies of disembedding⁴ is not whether they are artificial or foreign, but that they act as political instruments to create a new consensus. They are in conse-

⁴ Anthony Giddens explained this clearly when he proposed that *disembedding* (lifting out) was one of the typical circumstances of modernity. See his, *The Consequences of Modernity* (Cambridge: Polity Press, 1990), 88. See also, Ph. Brey, "Space-Shaping Technologies and the Geographical Disembedding of Place," in *Philosophies of Place: Philosophy and Geography*, ed. A. Light and J. Jonathan Smith (New York/London: Roman & Littlefield, 1998), 239-263.

quence moral machines and the basis of civic order. Without them there would be no social contract.⁵

If civility is a technical matter, efficiency is a moral challenge.⁶ Our world is obsessed with the problems associated with the management of time, including those whose roots are historical. Implicitly or explicitly we are told over and over again that to explain something is to relate history, and when we question this adulation of time, there emerges the conflict between modernists and post-modernists. But

⁵ For more details on how instruments produce values and consensus on scientific practice and the production of reality, see L. Daston, "The Moralized Objectivities of Science", in *Sonderbruck aus Wahrheit und Geschichte*, ed. W. Caarl and L. Daston (Göttingen: Vandenhoeck and Ruprecht, 1999), 78-100. On the material conditions of this consensus it is also worth considering, A. Pickering, "Living in the Material World: on Realism and Experimental Practice", *The Uses of Experiment. Studies in the Natural Sciences*, ed. David Gooding, T. D. Pinch, and S. Schaffer (Cambridge/New York/Melbourne: Cambridge University Press, 1992) 275-297. On the minimum characteristics of technological consistency and the margins of flexibility permitted by the local adaptation of machines see, M. De Laet and A. Mol, "The Zimbabwe Bush Pump: Mechanics of a Fluid Technology," *Social Studies of Science*, 30 (2000): 225-263.

⁶ The association of efficiency with moral values is determined by two aspects. First, by the association of scientific results with epistemic values related to rigor, objectivity, accuracy and disinterest, applied to do away with any suspicion of any possible arbitrary manipulation of the results. See, L. Daston and P. Galison, "The Image of Objectivity", *Representations*, 40 (1992): 81-128; S. Schaffer, "Astronomers Mark Time: Discipline and the Personal Equation," *Science in Context*, 2 (1988): 115-145; P. Dear "From Truth to Disinterestedness in the Seventeenth Century", *Social Studies of Science*, 22 (1992): 619-632. But secondly, too, due to the emergence of biopolitics that have to use broader degrees of precision in order to guarantee that the task of government may be centralized: I. Hacking, *The Taming of Chance* (Cambridge: Cambridge University Press, 1990); T. Porter, *Trust in numbers. The Pursuit of Objectivity in Science and Public Life* (Princeton: Princeton University Press, 1995); A. Rusnock, "Quantification, Precision and Accuracy. Determinations of Population in the Ancien Régime", in *The Values of Precision*, ed. N. Wise (Princeton: Princeton University Press, 1995), 17-36.; A. Lafuente and N. Valverde, "Linnaean Botany and Spanish Imperial Biopolitics", in *Colonial Botany. Science, Commerce, and Politics in the Early Modern World*, ed. L. Schiebinger and C. Swan (Philadelphia: University of Pennsylvania Press, 2004): 134-147.

there is another conflict that cannot be ignored: that sets natural against artificial, that imposes on our machines an existence separate from that of our bodies. Such a statement ignores the fact not only that they are extensions of our own sensitivity, but also the creators of our sociability. Our world can no longer afford the abstractions implied by the separation of ideas from the techniques that produce and mobilize them. The discussion we wish initiate is not that which supports the importance of history, but that which demands that we pay greater attention to technology. What is in question is not whether we are post-modernists, but what remains before we accept our destiny as post-humans. In short, to try to distinguish between subject and object is an effort that will end in despair: in the *polis* all we can talk about is the reality arising from the actions of weighing and measuring; so long, that is, as we introduce some artifact capable of producing the figure that defines the object or, if you will, creates it.

The discipline of treasures

Anyone finding a meteorite of uncertain origin and unknown composition, whatever its size or location, knows at once that it will augment human heritage, and that its place is in a museum. How do we know that it is treasure? We do not in fact know, even though the ability to make this sort of judgment is one of the main objectives of the educational

system.⁷ The merit, however, lies in realizing that a lump of stone (or a bone, a carving, a manuscript or a germ) is an object of great value, that can only be confirmed by someone who has the sensitivity and, above all, the tools needed to objectivize certain determining features. From this it follows that the relationship between heritage and technology is so close.

No doubt many people will understand it, but it is difficult to justify the fact that France has more than 4,000 museums and a list of buildings with 188,315 entries, of which 41,812 are classified as historical monuments⁸. It is clear that those who realize that the roots of identity lie in

⁷ On the early stages of the development of this sensitivity and its popularization, see A. Secord, "Botany on a Plate. Pleasures and the Power of Pictures in Promoting Early Nineteenth-Century Scientific Knowledge", *Isis*, 93 (2002): 28-57; S. Schaffer, "Natural Philosophy and Public Spectacle in the Eighteenth Century", *History of Science*, 21 (1983): 1-43; L. Stewart, *The Rise of Public Science. Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750*. (Cambridge, Mass: Cambridge University Press, 1992).

⁸ See http://www.culture.gouv.fr/public/mistral/merimee_fr. As far as architectural heritage is concerned, there are in France 263,526 items listed, of which 107,319 have been declared historic monuments. The number of publicly owned museums is about 1,400, according to the European Museums' Information Institute (<http://www.emii.org/map/fr.htm>). The Ministry's register of Spanish property runs to 43,521 items (<http://www.mcu.es/bases/spa/inbi/INBI.html>), but in the list is still incomplete. The most amazing case of heritage inflation seems to be that of the United Kingdom. There the number of places, monuments or buildings that are considered part of the national historic or natural heritage and which enjoy some kind of legal protection has risen from about 1,000 in 1945, to nearly 10,000 in 1960, to the figure of a million today. The situation has led P. J. Boylan to reflect on the tendency to conserve 'practically any conceivable element of an often newly-invented heritage' and the fossilization of city centers. See his "The Heritage Dimension in late 20th Century Culture", Research Paper for the Council of Europe's Task Force on Culture and Development, 1994-95. A general assessment of the financial problems associated with heritage management is to be found in, Economics and Heritage Conservation. A Meeting Organized by the Getty Conservation Heritage (Los Angeles: Getty Cenmter, 1998), accessible on-line <http://www.getty.edu/conservation/resources/econrpt.pdf>

heritage are legion; but sadly we still do not know what the term means, much less when it is written in the singular. We apologize to anthropologists, to the publishers of *National Geographic* and antique-dealers, also to tourist companies and the legion of conservationists and restorers: we plead guilty to not understanding what identity is. We do not know how to measure it, nor what to compare it to. We know this is an unpardonable sin, now that so much is spoken about multiculturalism. If identity is so important, why not declare the whole country as our patrimony? Why should museums have boundaries? The simplest answer is financial, for it is very expensive to maintain the heritage. And moreover it has always been a controversial subject. An excess of public patrimony will not only exhaust the state's resources, but can give rise to a spiral of conflicts that is very difficult to deal with.

Let us look at an example. 1790 was a great year for Mexicans of Spanish descent. A few months apart, and only yards from the great centers of metropolitan power (the viceregal palace and the cathedral) were found the Stone of the Sun and the *Coatlicue*, two pieces that alone would be enough to fill a museum and to satisfy much hunger for the past. And this was indeed what happened, for exalted settings were ordered for both of them. The former, the so-called Aztec Calendar, a twenty-five-ton monolith of about 3.60 meters in diameter, was fixed to the wall of the temple itself and the second was displayed in the courtyard of the University. The Viceroy Revillagigedo, as we can see, took advantage of the opportunity to display the pride of his victorious bloodline, greater still when compared to the earlier achieve-

ments of those natives. If in the Iberian Peninsula archaeologists were discovering their Roman inheritance, those in the colonies were not going to turn their noses up at the legacy of the Aztecs. But the word inheritance, then as now, was a hotbed of conflict. The pieces were as beautiful as they were complex, a real trophy for anyone who was aware of the discoveries being made on the other side of the Atlantic, in Naples, Mérida or Córdoba.⁹

Antonio León y Gama (1735-1802), a brilliant *criollo* astronomer and scholar, soon published a beautiful treatise in which he was able to exhibit his exquisite and unusual erudition.¹⁰ Both stones were a priceless object of study, a case that would prove beyond doubt the breadth and rigor of pre-Columbian astronomical and mathematical knowledge.

⁹ See, G. Mora, *Historias de mármol. La arqueología clásica española en el siglo XVIII* (Madrid: CSIC, 1998); J. Arce and R. Olmos, eds, *Historiografía de la arqueología y de la historia antigua en España (siglos XVIII-XIX)*, (Madrid: Ministerio de Cultura, 1988); A. Mestre, *Apología y crítica de España en el siglo XVIII* (Madrid: Marcial Pons, 2003).

¹⁰ In the second half of the eighteenth century there took root in the intellectual world of New Spain a current of thought warning of the need to set up museums to bring to light the cultural, scientific and anthropological characteristics of the country and its different regions. The works by Francisco Xavier Clavijero, *Historia antigua de México* (1780); José Antonio Alzate, *Las antigüedades de Xochicalco* (1791); Antonio de León y Gama, *Descripción histórica y cronológica de las dos Piedras* (1792); as well as the impressive example that Lorenzo de Boturini set to his contemporaries when he compiled the greatest collection in Mexico of codices and written material; or, later, the exploration undertaken around 1805 by Guillermo Dupaix and the artist José Castañeda through the Mexican altiplano and South-eastern areas, in search of monuments of archaeological value and high plains and antique objects under the auspices of Carlos IV; all formed part of a huge movement to rescue antiquities. See, E. Florescano, "La creación del Museo Nacional de Antropología y sus fines científicos, educativos y políticos", in *El patrimonio cultural de México* (México DF: FCE, 1993); J. Cañizares-Esguerra, *How to Write the History of the New World. Historiographies, Epistemologies, and Identities in the Eighteenth Century Atlantic World* (Stanford: Stanford University press, 2001).

They were both symbols of an ancient grandeur that had not been lost but only hidden or, rather, repressed: two treasures on which native science and native politics could be founded. But in the case of the Coatlicue, the number of heirs was not to be limited to two, for the Indians saw in those stones a relic that revived their sacred ancestral rites, and lost no time in going to visit it. The authorities soon realized that the Indians had not gathered due to 'national pride' or, as was to be expected of a man of the Enlightenment, 'to contemplate one of the great works of their ancestors', but for reasons that were classified as fanaticism and idolatry. The consequences were immediate: they were forbidden to enter the University Courtyard and the order was given to bury the piece there and then to avoid any form of paganism.¹¹ The same object, then, passed through the three conditions of trophy, treasure, and relic, unequivocally showing its boundary nature,¹² midway between as many worlds whose practices and cosmovision appeared theoretically insurmountable. However, time will vindicate the person who is able to activate the object in the most effective way. In this case, it was León y Gama who initiated a tradition of research capable, in one discourse, of

¹¹ J. Alcina Franch, *Arqueólogos o anticuarios. Historia antigua de la Arqueología en la América española* (Barcelona: El Serbal, 1995), 122.

¹² The concept was introduced by Star in order to identify intellectual tools shared (and used in different or peculiar ways) by several communities of practice: S. L. Star, "The Structure of Ill-Structured Solutions: Boundary Objects and Heterogeneous Distributed Problem Solving," in *Distributed Artificial Intelligence*, ed. L. Gasser and M. Huhns (San Mateo: Morgan Kaufmann, 1989). Gieryn has broadened the concept to allow things, processes, peoples or ideas to attain the status of 'boundary', so long as they are capable of permeating through the limits separating different social orders. T. Gieryn, "Boundaries of science," in *Handbook of science and technology studies*, ed. S. Jasanoff, et al. (Thousand Oaks, CA: Sage Publications), 393-443.

fusing together the credibility of mathematical formulae, the accuracy of archaeological testimonies and the legitimacy of ethnographic memory. Everywhere scholars faced similar crossroads. Resolving the conflict between local culture and scientific practices was equivalent to clearing the way for to the formation of the modern state. In order to globalize native wisdom, realizing its value and loosening it from its ties, it had to be explained in the language of the newly emerging bureaucracy, or if you prefer, using the conceptual conventions and experimental tools of modern science.¹³ (Lafuente, 2000).

Things were not much different back in Spain. Concern for the decadence of ancient glories (Biblical or Imperial) had to be explained, in the words of the lawyer Juan Sempere y Guarinos, the staunchest apologists of the Spanish King Carlos III and his reign, ‘because neither the prudence nor the unhappiness of nations is the product of mere chance’ (Sempere y Guarinos, 1788 (I): 18). And of course in order to find the cause of a decline it is necessary to have objective-sation procedures that can be checked. At that point history ceases to be a chronicle and a hagiography, and becomes a public enterprise, discipline-based and thus political. And since the search for explanations needs to be very methodical and demands a good deal of information and many calculations, scholars devote themselves to looking into the past for glimpses of strategies, inventions, calculations or traces that

¹³ A. Lafuente, “Enlightenment in an Imperial Context: Local Science in the Late-Eighteenth-Century Hispanic World,” in *Nature and Empire: Science and the Colonial Enterprise*, ed. Roy MacLeod, Special issue of *Osiris*, 15 (2000): 155-173.

might reveal an order that could evolve and/or decline. At this point there were problems aplenty, but there were two whose urgency was most pressing: first, the preparation of technologies of dating and localization, the *when* and *where* expressing historic statement; and the second was to agree on the variables (technological inventions, architectural constructions, productive processes or graphic representations) whose traces could define the arrow of time, or the signs of progress. To place a group of artifacts, virtual or mechanical, within the course of history meant seeing the world of inventions as an achievement that, unlike that of art, was by nature collective and familiar, the anonymous fruit of (local) improvement and (secular) imitation of widespread practices.

The consequences were spectacular. Technical knowledge also had to be a common, circulating freely, demanding a novel system of patents, greater recognition for model-makers and draughtsmen, and an uncompromising war against the craft guilds¹⁴. And historians too had a task before them, for the value of things is confused with the difficulty of producing them and, as a result, the objects that give evidence of any calculable degree of skill or civilization are no longer lumps of stone or scribblings. Yes, we do have a

¹⁴ See A-H. Thamer, "On the Use and Abuse of Handicraft: Journeyman Culture and Enlightened Public Opinion in 18th and 19th Century Germany", in *Understanding Popular Culture. Europe from the Middle Ages to the Nineteenth Century*, ed. S. L. Kaplan (Berlin/New York/Amsterdam: Mouton, 1984), 275-300; L. Hilaire-Pérez, "Invention and the State in 18th Century France", *Technology and Culture*, 32 (1991): 911-931; L. Hilaire-Pérez, *L'invention technique au siècle des Lumières*, (Paris: Albin Michel, 2000). For the Spanish case see, A. M. Roncal, *Gremios e Ilustración en Madrid (1775-1836)*, (Madrid: Actas, 1998); and, on economic policies associated with guild politics, E. Lluch, *Las Españas vencidas del siglo XVIII. Claroscuros de la Ilustración* (Barcelona: Crítica, 1999).

common past (belonging at the same time to everybody and nobody); and the second novelty is that it is technical. What can be imitated from our past are its processes, hidden or forgotten, and so we achieve that strange squaring of the circle whereby the technologies of the past are seen as the root of a common heritage and the leitmotif of a discourse capable of homogenizing the plurality of local or regional histories. What León y Gama did, what Sempere y Guarinos wanted to do, was to study the technical accomplishment imprinted on those stones and to put them forward as a shared model. The importance of the past and its witnesses is not in doubt. This is a history whose interest grows as it reflects more and more technical splendor: ‘A building’, wrote in 1790 José Antonio de Alzate, Mexican priest, journalist, and one of the most famous scientists and intellectuals of his time, ‘shows the character and culture of the people: for it is clear that civilization or barbarism are manifest in the progress that nations make in sciences and arts’.¹⁵

Much has been written about scientific expeditions of the eighteenth century, and there is an abundance of texts describing the broadening of botanical, medical, geological and geographical knowledge. And there is no shortage of reflections of the interest in anthropological, ethnographic, and geographical matters. However, it must be admitted that

¹⁵ Quoted in Alcina Franch, *Arqueólogos o anticuarios*, 113 (cit. n. 11). J. Sempere y Guarinos followed the same line in his *Historia del Luxo, y de las leyes suntuarias de España* (Madrid: Imprenta Real, 1788). Recalling the works of Tarquinius, one of the Roman kings who devoted most attention to public works, he writes: These public works cannot have failed to influence in the minds of the Romans the love of fine arts, and the ideas of taste, comfort and delicacy that are regularly imparted thereby’.

we still have some way to go in understanding the scope of the expeditions whose objectives were documental, archaeological or numismatic. It appeared more and more urgent to explore the formation of collections and the traffic of objects from antiquarianism to academicism, and from private hands to public collections¹⁶. Indeed, there was a collecting fever that was paralleled by a proliferation of excavations and violations. If proof were needed, here is a document convincingly showing the Enlightenment's drift towards monumentalist hypertrophy. It is a Royal Decree of 6 July 1803, prepared following an Instruction from the Real Academia de la Historia,¹⁷ on how to collect and conserve ancient monuments: *'By ancient monuments shall be understood statues, busts and bas-reliefs of whatever material, temples, sepulchers, theaters, amphitheaters, circuses, naumachias, palaestras,*

¹⁶ As new goals were identified for collections, objects were purged or reorganized. The case of Kircher's Museum, that would cease to be a Gallery of Art and Mechanics and was turned into a Museum of Classical and Ecclesiastical Antiquity, has been considered paradigmatic. See, P. Leturia, « Contributo della Compagnie di Gesù alla formazione delle scienze storiche » in *La Compagnia di Gesù e le scienze sacre. Conferenze commemorative del quarto centenario dalla fondazione della Compagnia di Gesù tenute alla Pontificia Università Gregoriana, 5-11 November, 1941* (Rome: Universitatis Gregorianae, 1942). In the European sphere, literature on collections has grown considerably since the works of O. Impey and A. MacGregor, *The Origins of Museums: the Cabinets of Curiosities in Sixteenth and Seventeenth Century Europe* (Oxford: Clarendon, 1985); K. Pomian, *Collectionneurs, amateurs et curieux: Paris, Venise XVIIe-XVIIIe siècles* (Paris: Gallimard, 1987); P. Findlen, *Possessing nature: museums, collecting, and scientific culture in Early Modern Italy* (Berkeley / Los Angeles/London: University of California Press, 1994). However, we are not aware of any specific studies showing the evolution of the implicit value of each collection, not only from an economic point of view but also the legal status acquired by objects when they are introduced into spaces that change ownership.

¹⁷ The so-called 'Instructions of the Marqués de la Ensenada', drawn up in 1753 to facilitate the performance of the archaeological commission aimed to produce a history of Monumental Spain, forerunners of those of 1803 that must be classed as the first document for the protection of the Spanish archaeological heritage.

baths, roads, paths, aqueducts, stones or inscriptions, mosaics, coins of whatever type, cameos: pieces of architecture, milestones; musical instruments, such as rattles, lyres, bells; sacred [instruments] such as amphorae, ladles, crosiers, sacrificial knives, axes, stoups, vases, tripods: arms of all types, such as bows, arrows, slingshots, quivers, shields; civil [instruments] such as scales and their weights, balances, sundials or clocks, armillary spheres, necklaces, crowns, rings, seals: all kinds of utensils, instruments of liberal and mechanical arts; and finally whatever things, yet unknown, held to be ancient, whether Phoenician, Roman, Christian, whether Gothic, Arabic and Medieval. In other words: everything is of interest.

To say that something acquires the status of a patrimonial good implies that the item is subject to various disciplinary rules. The first seeks to define it according to the available technology, whether to determine its composition or age, or to reduce it to a plan or to fix its dimensions. Chemistry, chronology, and planimetry, among other branches of knowledge, act as auxiliary sciences and their judgments are important for everything relating to the preservation of the piece. As we have said, an object is only properly defined when the parameters determining its characteristics as well as the procedures employed to measure them are made public. To give an object historical value is tantamount to giving it scientific and legal substance. We are talking, then, of a heritage that can only be constructed by the intensive intervention of our technologies and, as a result, that can only be defended (preserved) if we keep variations of those parameters defining its value within reasonable limits.

The second discipline we mentioned is the market. By protecting something against commercial exchange, we favor the emergence of a traffic, public or private, in similar objects or simply in copies.¹⁸ Museums play a decisive role here, for in the same way that facts acquire credibility when they are experimental, so the value of objects increases a hundredfold when they go into a museum. The laboratory and the museum thus act as launch pads, favoring movement through two different but complementary networks: that of scientific objects and that of patrimonial objects, in other words, that of science and patrimony. And just as in the eighteenth century botany could not survive without apothecaries, gardeners, and artists; the same applies to archaeologists without the swarm of dealers, collectors and valuers. It is not easy to tell a researcher from a valuer and, wherever we look, we will always find little huddles of experts, scholars, specialists and charlatans arguing over the object, shaking it about, and transferring it into other hands.

The politics of the chest-of drawers

In modern Peru the name of Saint Peter – San Pedro – is still used to identify dozens of rivers, a colonial legacy

¹⁸ The clearest indication of the traffic generated by museums is surely the increasing development of technologies for the detection of fakes, and the market ratings of artistic reproductions. See, M. Jones, ed., *Fake? The Art of Deception* (London: British Museum Publications, 1990; J. Keller, "Print market changes, reacts to tough year; Art Business News' survey of 414 gallery owners reveals trends in the world of published art", Special report in *Art Business News*, October 15, 2002, on http://www.findarticles.com/p/articles/mi_mOHMU/is_7_29/ai_88577350

totally unacceptable to an apprentice bureaucrat. Nonetheless, there they are, all different but linked together by the same two words. Any civil servant would have used the Christian calendar of saints and established a straightforward relationship between heavenly beings and earthly features. To ensure the tidiness of the result he would have adjusted his workspace to suit the object under research and installed accordingly chests-of-drawers with index cards ordered alphabetically, one per river, to avoid duplications. A sketch-plan of the room, then, would show the location of the large number of filing cabinets required; for, as well as rivers, there were convents, plantations, and estuaries to be administered. And, to finish the parable, he would discover that plans, drawers, and saintly calendars are a very efficient tool for controlling the territory. Certainly the repeated appearance of Saint Peter would be considered an abuse (of religion) and an error (of management). And nobody can be blamed for the mistake, because it only becomes apparent when somebody checks the sketches, when the will to govern replaces the will to dominate, and not a single street or gully remains outside the Grand Picture. And so that all these pieces can fit, they must be submitted to symbolic violence so disproportionate that it becomes necessary to found an Empire. We do not mean force, but management. That is, common codes and shared language. Science and Empire are thus mutually cause and effect. They do not coincide, but they do determine each other.

It seems very problematic. In fact, it is necessary to share the illusion that things can be fitted into letters, ciphers, outlines, marks, gradients, or currents. In short, that

they can be transferred to a plan, that the plan can be a piece of paper, and that the raw materials, the processes and the place where it was made can be filed, on another piece of paper inside a cabinet. It is necessary, but we know that it is not enough. What distinguishes a geographer from a filing clerk is the former's status as a witness. And the same could be said of a botanist or an astronomer, which are other skills calling for fieldwork: *in situ* scholars.¹⁹ People who go off in search of their objective and bear witness of its manifestations. Experts who, as well as their own persons, move data, instruments, paper. And this all gives them an influence over what they observe and record, as it does over those who send them and those who listen to them. Upon their return both observers and those who sent them admit the possibility that their papers enable knowledge and action from a distance²⁰.

An enlightened scholar needs no explanation of expeditions or suchlike *technoscopes*. Especially not if we think of the second half of the century, when courts on both sides of the Atlantic were seized by a fever for the accumulation of data, drawings, maps, plants, rocks, bones, shells, textiles, books, arms, catalogues, dictionaries, plans, minia-

¹⁹ The moral and epistemological qualities they should possess have been described by, among others, J. Pimentel, *Testigos del mundo. Ciencia, literatura y viajes en la Ilustración* (Madrid: Marcial Pons, 2003) ; D. Outram, "New Spaces in Natural History", in *Cultures of Natural History*, ed. N. Jardine, J. Secord and E. Spary (Cambridge: Cambridge University press, 1996), 249-265.

²⁰ See J. Law, "On the Methods of Long-distance Control: vessels, Navigation and the Portuguese Route to India", in *Power, Action and Belief: A New Sociology of Knowledge?*, ed. J. Law, *Sociological Review Monograph 32*, (Routledge, 1986) ; S. J. Harris, "Mapping Jesuit Science: The Role of Travel in the Geography of Knowledge", in *The Jesuits: Cultures, Sciences, and the Arts, 1540-1773*, ed. S. J. O'Malley, (Toronto: UTP, 1999), 212-240; P. Carter, *The Road to Botany Bay. An Essay in Spatial History* (London: Faber, 1987).

tures, models, porcelain, tapestries or machines and other historical objects. The expedition is much more than a journey of the erudite, for it implies many commitments, ranging from the support of a sovereign to the coordination of an accumulation of activities and people all aiming towards one goal, calling, at the very least, for agreement on instruments, language, formalities and hierarchies. An expedition can be seen as a great artifact, a sort of mobile toolbox, full (like ships) of human and non-human actors, and where we cannot judge in advance which of the protagonists is working as an extension of the other. We do not know now, and Alzate did not know then, when with his proverbial irony he wondered aloud why, in order to talk about a plant it was necessary to hide all that was known about its location, surroundings, flowering season or soil type.²¹ It seems absurd, but that is how it was. We know that the Linnaean system operates a very efficient interface, although it is insensitive to local and seasonal circumstances. And nowhere could the *criollos*- those of Spanish descent- ever agree for, as Alzate *[...] it is a remarkable thing that the slow-wittedness of a man, however studious and observant, as we suppose Linnaeus to be, should wish to inspect the troops of the whole globe in order to record them, impose new names, and tell them where they should stand*'. His perspicacity is indeed astonishing, because very few could see the enormous

²¹ See A. Lafuente and N. Valverde, "Las políticas del sentido común: Feijoo contra los dislates del rigor," in *Feijoo, hoy*, ed. Urzainqui, I. (ed.) (Oviedo: Fundación Gregorio Marañón / Instituto Feijoo de Estudios del siglo XVIII, 2004) 131-157; S. Müller-Wille, "Joining Lapland and the Topinambes in Flourishing Holland. Center and Periphery in Linnaean Botany", *Science in Context*, 16 (2003): 461-488.

disproportion there was between the hugeness of the world and the smallness of the laboratory. The Cabinet of Uppsala, its brilliant occupant and his however-many chests-of-drawers were too small to hold the world. Nowadays we would never question these extremes, but from a distance they are poignant.

This disproportion is no less evident when instead of books, be they treatises or inventories, what we wish to inaugurate are museums. Here the Enlightenment was at least up to the standard of the present day. And as we are talking about an enclosed area that can only display what fits inside it and what we can conserve, nothing is more predictable than the appearance inside it of accommodation devoted to simulation or replicas, such as wax-modeling rooms, model-making studios, restoration laboratories and taxidermy workshops. Elsewhere the shelves are more than mere furniture, since they function as media adapted to the object to be legitimized. Any item falling into this framework of planks will be forever divorced from its place and culture of origin, as well as drafted into another scheme of meanings. It is no coincidence that all natural history collections look the same. In its apparent simplicity or familiarity, the labeled grid of shelves acts as an indispensable device for preserving names.²²

²² On the physical organization of scientific material and the movement of reference see, Bruno Latour, *L'espoir de Pandore. Pour une version réaliste de l'activité scientifique* (Paris: La Découverte, 2001), chap. 2; the epistemological and political texture underlying these apparently simple processes is amply dealt with in G. C. Bowker and S. L. Star, *Sorting Things Out: Classification and its Consequences* (Cambridge, Mass: MIT Press, 1999); J. Fabian, *Time and the Other. How Anthropology makes its Object* (New York: Columbia University Press, 1983).

This is the fundamental difference from Cabinets of Curiosities. In effect, a museum of the Enlightenment was the epitome of modern rationality, since it combined the four activities of naming, knowing, disseminating and owning in inseparable parts of the same move. For this reason modifying a museum means putting many specialists to the test as well as (and this is what we find most remarkable) the stable or stabilized fabric of ordinary experience: in other words, the agreed ways of looking at and dealing with our surroundings. So a museum is also a boundary object. It does not belong exclusively to the experts who handle the pieces they keep within, but also to those who want to buy and sell them: in other words, all those who think that museums hold everything worth conserving, everything we need to pass from generation to generation, whatever it costs in terms of budgets and officials, or in terms of inventories, laws and buildings. When in 1821 the British Museum set in motion a process of *aggiornamento* to get rid of its old Linnaean organization, D. Stewart Traill, in charge of the collections, protested indignantly: 'I am opposed', said the naturalist, 'to any unnecessary change in nomenclature; [...] the adoption of such an innovation in a private collection would be ascribed to bad taste; in a new book they would draw down wholesome castigation of the reviewer; in a public museum they merit the reprobation of every true friend of science'.²³ Museums, we are told, cannot be anyone's caprice: they were conceived to stabilize the world; they are above fantasy, opinion, and

²³ Quoted in McOuat, "Cataloguing power: delineating 'competent naturalists' and the meaning of species in the British Museum", *British Journal of History of Science*, 34 (2001): 1-28, on 10.

even theoretical invention. Museums would only survive as the depository of common sense.

Whatever they may be, the fact is that very soon after they opened they were already seeking autonomy with respect to the projects with which they had originated, and were asking for resources of their own to organize journeys and to complete their collections, or to fill the gaps on their shelves.²⁴ And so the museums entered the bidding to obtain objects, encouraging the extravagant market in scientific objects mentioned above. Many arguments were wielded in defense of this ambition to complete collections, but they never failed to mention usefulness to the nation, national prestige or scientific education.

In botanical gardens problems took a very novel form, since to give full account of natural variety implied deploying a policy of transplantation (not just of acquisition) that raised the greatest economic and business expectations. To bring a collection of minerals or American ruins to the court in Madrid was the dream of every enlightened courtier, but reproducing floral wealth in an enclosed site was an ambition shared by all the political economists of Europe. There is no shortage of examples to help us to understand the new

²⁴ This is the case of the Spanish Real Gabinete de Historia Natural (Royal Natural History Cabinet), that from 1777 onwards received the zoological and mineralogical samples collected on different expeditions. In the Gabinete the materials were classified, ordered and evaluated, making suggestions according to fields of interest. From 1793 onwards, however, expeditions began to be organized from the Gabinete with a view to filling the gaps of important objects it should contain. See, A. Barreiro, *El Museo Nacional de Ciencias Naturales (1773-1935)* (Aranjuez: Doce Calles. 1992), 89. It was this practice that would justify the organization of expeditions such as that of Molina, the Heuland brothers and that of Gimbernat to the Alps, as well as numerous explorations in Spain carried out, among others, by Talaker, Molina and Vilella.

relationship that was arising between research, preservation and exploitation of natural resources. And none better than the forest.

When wood began to run short, botanists began to look upon the forests as storehouses of trees. And the culture of protectionism was gaining followers. However, no threatened species could be protected without the prior intervention of scientific research defining its particular qualities. Indeed, nobody can preserve an unfamiliar species: in other words, the management of a crisis (such as, for example, that arising from the extinction of trees used in naval construction) is considerably better when it is possible to identify the particular attributes (always associated with a species) that are to be promoted. The study of plants, the exploration of territory, the establishment of businesses and the protection of woodland were activities that were interconnected in many different ways. Still it is impossible not to see the close relationships built up by botanists between the garden as an experiment and the forest as a laboratory.²⁵ Yet there is also an obvious correspondence between the garden as museum and the forest as a storeroom. So much so that those of the Enlightenment turned the forest into an extension of the garden, and passed laws about its use as if it were in the public domain, subject to the dictates produced by scientists and engineers.

But here too, as was to happen in the case of questions of nomenclature or even of therapeutic uses, the *criollos* put

²⁵ See, N. Broc, *Les Montagnes au siècle des Lumières. Perception et représentation* (Paris: CTHS, 1991).

up a strong resistance, for protection was equivalent to a freeze, destroying much revenue from the timber business, including the taxes collected by the local authorities: ‘as long as the laws of nature do not fail us’, declared the Corporation of Quito, ‘there will be forests to spare in Guayaquil without need of Decrees to provide for their preservation’.²⁶ And in Cuba things were seen in much the same way: ‘it is morally impossible’, asserted the protest from the Royal Consulate about the measures that sought to prevent the depletion of the woodlands, ‘that it can be proved in the natural order of things’.²⁷ Those who talk like this seem convinced that botany capitulates outside the enclosure of the garden, for the laws governing open spaces maintain an order that only the natives understand.

In any case, we shall not go any further into the credibility of the two positions, obviously based on evidence that is as shaky as the two conflicting languages (or types of

²⁶ Towards the end of 1778 the President and Visitor of the High Court of Quito, José García de León y Pizarro, alerted by reports such as that of the engineer Francisco Requena (1743-1824), warning that certain forest areas were thought to be ‘quite exhausted’, issued an Order aimed at the protection of the forests of Guayaquil. The Corporation, that until then had tried to ensure that timber should be taxed in favor of the city, invoking the damage that could be caused by uncontrolled felling, now reacted declaring its total opposition. M. Laviana Cueto, “Los intentos de controlar la explotación forestal en Guayaquil: pugna entre el cabildo y el gobierno colonial,” in *Ciencia, vida y espacio en Iberoamérica*, Vol. 2, ed. J. L. Peset, (Madrid: CSIC, 1989), 406-407.

²⁷ Quoted in C. Naranjo Orovio, “Los reconocimientos madereros en Cuba (1780-1810),” in *El bosque ilustrado*, ed. M. Lucena Giraldo (Madrid: ICONA, 1991), 110. The argument for the existence of a profuse and specific natural environment, in-depth knowledge of which could only be achieved by involving the natives, was used again on the occasion of the controversy over the cinchona bark monopoly. See, M. A. Puig-Samper, “El oro amargo. La protección de los quinares americanos y los proyectos de estanco de la quina de Nueva Granada,” in *El bosque ilustrado*, ed. M. Lucena Giraldo, (Madrid: ICONA, 1991), 235.

forest) are untranslatable. The forest, as has already happened to the Stone of the Sun, becomes a boundary object, and since the botanists had earned the right to uphold their own points of view, the *criollos* had to use their ingenuity to try to appropriate an object that, being an unregistered secular legacy, had been emancipated and mobilized by envoys from the metropolis using technologies transforming a common good into public property.

Common good and patrimony

There are few accounts of the eighteenth century that do not stress the importance of the ideal of technical progress conceived by Enlightenment thinkers. Technology, without doubt, is one of the main protagonists of our world, and its hegemonic deployment is related to some of the processes outlined here.

The two cases studied, ruins and forests, showed themselves to be boundary objects: that is, objects situated (technically and scientifically) at the crossroads between different cultural traditions, sometimes complementary and sometimes competitive. But the important thing, in the final analysis, is to redeem the idea that was emerging at the time that something like the dignity of the Aztecs or the attributes of a species should be a common good, preserved from any threat. What dangers do we mean? First, oblivion and second, abuse.

Let us pause for a moment to look at the form taken by these two threatened realities, shared memory and bio-

logical diversity. We call them realities because, in fact, they came into the collective consciousness when they were emancipated or, in other words, when they were quantified, tabulated and recorded; that is, since we introduced our technologies and their rules of usage and inscription as mediators. And, since we have brought together testimonies that talk of dying off and decadence, we have had to talk of threat, a term that necessarily brings into circulation a whole new group of players, from expert valuers to the officials, delegates and bureaucrats occupied in vigilance, listing and preservation; not to mention the paraphernalia of files, shelves, competitions, commissions, contracts, taxes, valuations or catalogues. In brief: at the same time as the thinkers of the Enlightenment discovered the role of technologies in the formation of consensus they realized the need to convert fragments of reality into a common good. And to guarantee the continuity of the commons and of the consensus, the most acceptable formula they could find was to broaden the public domain to take in the common good. From this arose a collective of experts whose mission was to interweave the threads of the new technologies and the new commons to produce modern forms of fellowship.

From the common good was born a public patrimony, built on manifold commitments interweaving old yearnings for justice and new ideals of austerity. But not every threatened good can be saved by turning it into patrimony. If anyone were to say now that the air we breathe should be a common, he would immediately have to design a chain of laboratories, protocols and norms to define what is healthy air, as well as criteria to improve and protect it. Would the state be the

main manager of these protocols? Does defining something as a public good necessarily turn it into something public? In modern times, since the Enlightenment, the answer is emphatically yes, and only yes. However, today we can admit that the identification of common with public has a date of birth, and perhaps a date of expiry. It came into being because the management of the common good, as was discovered in the eighteenth century, was a profoundly technological undertaking, and only the state was able to absorb the costs and smooth over the controversies.

The state then built on its technological hegemony the highway that connects *common* with the public domain, and created an enormous heritage for all to enjoy. Now we see that knowledge is moving further and further away from the notion of commons and that, moreover, more and more segments of knowledge are unacceptably being privatized, such as traditional learning, software and the genome. And let us state it succinctly: everything that becomes patrimony can change hands, even public hands; to avoid this we urgently need to define new commons, whose maintenance is based on the gift economy, for now the citizen has, for the first time in history, access to the technologies and the resources that would enable us to sustain a range of commons belonging to everybody and to nobody.