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RÉMI LABRUSSE. *Could you describe your career path as a researcher? How did it lead you to textiles?*

Jean-Paul Leclercq. From 1994 to 2006 I was curator of the collections of pre-1914 costumes and textiles at Les Arts décoratifs in Paris, and I took on the task of expanding them.¹ Putting my advocacy for collaboration between museums into action, I drew up the dossier that enabled the Musée des Tissus in Lyon to acquire the 190 *Grands livres de fabrique* of the Lyon-based company Bianchini-Férier (1889-1964, a continuous series of some 25,000 fabrics to stimulate thinking), which had employed artists such as Raoul Dufy and Paul Iribe. This acquisition was made with assistance from the Heritage Fund,² whose support is “reserved for acquisitions of cultural properties of major heritage importance” and had the fortunate effect of conferring inalienability on the collection, both aspects that acted to counter the threats of closure facing the museum.

As both researcher and curator, I designed two important exhibitions. The first, “Jouer la lumière” (25 January 2001 – 3 February 2002, over 100,000 visitors), combined the science of vision and optics with the history of art and its techniques in order to shed light (literally and metaphorically) on the directional visual properties of textiles,³ their genesis and uses long before the kinetic art of Yaacov Agam or the ultrablack of Pierre Soulages, with examples dating from the 15th century to the year 2000. Strangely, this turned out to be a world first. The second, “L’homme paré” (30 October 2005 – 30 April 2006), included more recent elements of design and was staged with support from Pamela Golbin, head of the post-1914 collections. More anthropological in approach, this exhibition explored cultural sexual dimorphism in human beings,⁴ reminding us that finery was once worn by men at least as much as by women, inverting the masculine and feminine attributes we are used to. It was an

invitation to fashion designers to give men back their appetite for adornment and to devise a replacement for the three-piece suit.

More broadly, I sought to play an active role in textile research, both in France and abroad, hosting visiting researchers, giving them access to the works and supporting them in their studies (LECLERCQ, 2014b). I was also involved as both speaker and coordinator at a great many specialist conferences, whether at Les Arts décoratifs,⁵ or for the Association française pour l'étude du textile (AFET) of which I was a founder member (1995) and president from 2002 to 2006, or as a member of the Centre International d'Étude des Textiles Anciens (CIETA).

The development of "Jouer la lumière" led me to invent the Goniophotoscope® (2002), a tool for visualizing the directional visual properties of textiles and other materials.⁶ Since retiring in December 2010, I have collected manuscript weaving manuals, with samples, which I use in the context of the silk Manufacture where I am working on the Collaborative and Critical Digital Edition of the *Encyclopédie*.⁷

I have been a photographer since my earliest involvement in the history of art in Brittany (preliminary inventory of the architectural heritage of Névez, Finistère, 1970-1971). I use photography as a medium through which to explore and present my objects of study, creating photographic breakdowns and series (LECLERCQ, 2013). I have always found it very productive to bring several different practices together in my work: researching and writing data entry software; providing text, illustrations and design for a publication; researching, taking photographs and making scale drawings (architecture) or technical analyses (fabric). These things enable me to link techniques to effects produced and to deduce the reasoning underpinning creative work. My research is not confined to textiles, and this is the key to my approach: I have tried to think textiles in their own terms, but also in the light of other fields, which I have then reconsidered in the light of textiles.

I obtained my *agrégation* in Classics in 1972 and began my work as a researcher in the field of general literary theory using material considerations as a basis for study (LECLERCQ, 2008). I then transposed this method into my work on the other arts. In the years 1973-1975 I taught French in the Literature faculty at the university of Bagdad, where this material-based approach brought me into direct contact with the reed houses of the Marsh Arabs⁸ at the confluence of the Tigris and Euphrates, and with the many uses of the date palm.

As Curator of the general inventory of monuments and artistic wealth of France in Auvergne (1977-1994), I again encountered the logic of materials in the use of wrought and cast iron in architecture,⁹ and became interested in the forms of vernacular architecture – with a predilection for the structural pleasures of frames –, the cultural areas they define,¹⁰ systems for the organization of ornamentation in religious goldsmithing (LECLERCQ, 1986) and campanology (LECLERCQ, 2014b), before coming to textiles via liturgical ornaments (1981).

My time as regional curator of the general inventory of the cultural heritage of French Guiana (2006-2010) enabled me to illustrate the visual effects of light in architecture near the equator – an unexplored field – drawing on my photographic practice and "Jouer la lumière". I also returned to the studious hobby of my childhood as an active field entomologist. I discovered species previously unknown to

science in Iraq and then in Yemen in 1976, including a chafer named for me as *Pachnoda leclercqi* (Rigout, 1985) by the specialist in the field. My knowledge of beetles led me to identify the potential for research on insects as inspiration in the arts, in terms of both their representation and aspects such as systems of variation, color, markings and micro-sculpture.¹¹ As a selector of habitats to prospect, I also developed research questions in the field of vernacular architecture. Lithological maps make it possible to locate rocks occurring in restricted areas, such as the limestone of Le Quiou in Brittany, which may have given rise to specific architectural choices.

All these years of research reflect the same heuristic approach based on observation and description. Considering objects of study (or their properties and data concerning them) as series leads us to approach the systems underpinning their variation through the gradual development of a combinatory matrix with logical properties that prove to have heuristic value and predictive powers. Its empty cells indicate what we should logically find, prepare us to find it and enable the transformation of the analytical matrix into a matrix of research and creation.¹² But at the start the mind needs something to hold onto, just as a nucleus is necessary to form a pearl. Often a material observation followed by explanation plays this role, triggering thinking, the chance hook one must grasp and transform into a firm hold, from where ideas can unfold in a chain. The things we have in front of us all the time are often those we look at least and we don't think about them. Consciously describing them is most likely to bring us something new (LECLERCQ, 2001, 2014a). Plato set out this principle in the revelatory effect of astonishment (*Thaetetus*, 155d).

RÉMI LABRUSSE. *At a time when the display of the Musée des Tissus in Lyon, one of the world's most prestigious textile collections, is under threat for budgetary reasons, how do you see the French historic heritage in the textile field? What are its riches? What kinds of dangers does it face in the medium term, and how should those threats be dealt with?*

Jean-Paul Leclercq. It is the done thing to visit the major exhibitions of painting, the most popular ones, but they seldom offer visitors anything equivalent to the additional structural pleasures of textiles. The silk *boyaux* (patterned reps) and *veloutés* (patterned tobines) made in Lyon in the early 19th century (LECLERCQ, 1999, fig. 3-5) foreshadow the poetry of the Bauhaus, while their orthogonality is more convincing than the graphic and hence arbitrary orthogonality of the painting and stained glass of Piet Mondrian and Théo van Doesburg. Textiles more clearly hold the keys to an understanding of their genesis – a little recognized advantage – and hence establish a competence threshold that must be reached to ensure understanding of the works and the reasoning underpinning their creation. This particularity sets the museum the task of equipping visitors with specific knowledge that can be transposed into other fields. They will leave seeing things in a different way.

The current uncertainties concerning the future of the Musée des Tissus are the collateral damage caused by government-imposed reductions to the fiscal resources of the chambers of commerce and industry. The redeployment of a large part of what remains of the textile industry in the Rhône-Alpes region to the production of technical textiles has finally pushed the entire significance of the Musée des Tissus – and the search for the right parent institution for it – into the domain of “culture,”¹³ which is ill prepared to cope. This was done a little too hastily, as though a revival of the textile industry and textile culture in France were unthinkable, or as though nothing could now be done with the textile heritage. The same general defeatism is

endangering museums with a textile collection in the form of products or machines, such as the museum in Roanne (knitting). Fashion is less threatened. Textile culture is disappearing among both academic specialists (aside from the field of technical textiles, which is governed by commercial secrecy) and designers (who tend to design patterns rather than woven structures or ideas for practical use), and also among most visitors. This suggests that a renewal of contact would generate the heuristically productive shock of experiencing the strangeness of things that were familiar at the time of the *Encyclopédie*.

Textiles are variously present in museums in the form of materials, drawings, and production lines – with looms and lace machines – and may be semi-finished (lengths of fabric) or finished (primarily fashions). The optimal situation is one of in situ conservation of machines and their products,¹⁴ but the textile collection proper is then limited in terms of place and time. Examples would be the Musée d'Art et d'Industrie in Saint-Étienne with its ribbon looms and textile collection (ribbons and point-paper plans), the Leavers lace of the Cité internationale de la Dentelle et de la Mode in Calais, and, in its own field, the Musée de l'Impression sur étoffes in Mulhouse. The Arts décoratifs in Paris is at once a school, library and museum with collections of decorative arts – including tapestry – wallpaper, advertising, toys, textiles and fashions, the latter present only at the Palais Galliera, Musée de la Mode de la ville de Paris, but the presentations of both are confined to temporary exhibitions. In Paris there are textile machines at the Musée des Arts et Métiers, but they do not form an operational sequence. In Roubaix, the textile collection at La Piscine, Musée d'Art et d'Industrie André-Diligent, focuses on fabrics; fashion is a recent addition and looms are at La Manufacture. The Musée des Tissus in Lyon has small-scale models of weaving looms and is linked to a museum of decorative arts, although the drawloom¹⁵ and Jacquard looms in Lyon are at the Maison des Canuts – merging collections can be very productive. Attractions differ depending on what is in the collections, what they make it possible to show and what visitors themselves read into them, far from what the curator may have thought.

RÉMI LABRUSSE. *Conserving textiles is one thing, exhibiting them is something else. In this field issues of display take different forms depending on whether the exhibitions are permanent or temporary. How, in your view, can textiles be made visually exciting while respecting the demands of preventive conservation – which, among other things, excludes the tactile dimension, which is nevertheless a fundamental aspect of textiles? How can a museum attract and win over visitors who often lack education in ways of looking at the so called “minor” arts and who may also be put off by the intrinsic complexity of the principles of textile production? How is it possible to educate people in ways of looking so that, in concrete terms, they will perceive and be touched by elements both upstream (the extraordinary technical mechanisms invented for textile production since the stone age) and downstream (the countless signifying systems they reflect)?*

Jean-Paul Leclercq. Textiles have undoubtedly constituted one of the great adventures of the human mind, at once technical, scientific, artistic, cultural and sensory. Textiles are present at every level of human development, from societies without writing to the learned heights of the literate, and continuing to explore them connects us to the long history of humanity, with a duty to enhance it with the contributions of our own times.

And they are an invitation! They invite us to productively reconcile culture in the narrow sense with technology and science – including the natural sciences where raw

materials are concerned, or when we interpret embroidered, woven or printed designs of flora and fauna, or draw on them in any way that is not trivial. The reverse is also true. In 1727, Antoine de Jussieu attributed the rise of botany and gardens to the appetite for embroidered flowers under Henri IV and Louis XIII; Philippe de Lasalle portrayed the Japanese green pheasant, *Phasianus versicolor*, some fifty years before its zoological description by Vieillot in 1825.¹⁶ The project of the *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers* (1751-1772) has lost none of its currency.

Curators are privileged to have access to works that are held in storage or cannot be viewed. This is often true of most of the collection for reasons of numbers, conservation (protection from light) and presentation (albums). They are also privileged to handle the works, to see both front and back – there’s an exhibition subject! – to examine them through a stereomicroscope, and so to acquire knowledge that is inaccessible to visitors, who see only the works displayed to the naked eye. So curators can reveal unknown worlds to their fellow citizens, in the form of works, approaches and phenomena. This is a duty on a scale with their privileges.

The ancient art of oratory included a grasp of *captatio benevolentiae*, or the art of arousing interest. It requires us to choose beautiful pieces about which there is much to be said, and the mere sight of which is enough to make visitors happy if they do not feel like listening to the curator. But there is nothing like revealing visual properties that seem at first to be inexplicable. As soon as you do this, your audience of visitors, be they elementary school children or the head of research on the physics of light at the CNRS,¹⁷ want to understand what they are seeing, and once this happens they are receptive to technical explanations, which can be kept relevant to this particular question. The dialectics of techniques and the effects produced, including the vast field of directional visual properties, offer an entirely new field to textile historians and other art historians. Similar phenomena can be seen in other fields, and it is necessary to understand them in order to correctly interpret the work undertaken by painters in their representations. This was the aim of “Jouer la lumière”, an exhibition that changed the way visitors saw the world. At the conference “Jouer la lumière: le textile, la lumière et l’œil”, in the nave of the Arts décoratifs, the designers couldn’t believe their eyes when they saw their works on an early version of the *Goniophotoscope*, on the scale that can be seen as the fabric is worked, then in a highly enlarged, oblique and dynamic view through a digital microscope with a rotary head such as the Hirox KH-7700.

RÉMI LABRUSSE. *In the overall category of “matrix arts” you have included the cast decorations of bells in the 18th century and the arrangement of holes on punched cards for the Jacquard loom in relation to textiles. These practices all see the invention of artistic forms in terms of a combination of pre-existing elements which – in the case of Jacquard looms – can be extended to include mechanical generating systems based on “matrices” in the mathematical rather than the strictly material sense. This matrix-based understanding underpins what you call a “generative approach” to forms based on the description of production procedures rather than the appearance of the finished product. You have shown how the entries on textile production in the Encyclopédie – mostly written by Diderot himself – marked a decisive advance in the conceptualization of this generative approach. You recalled that he wrote the entry on Damask: “the only complete definition that can be given of a cloth, and perhaps of a mechanical work in general, is to explain the entire process by which it is made.”¹⁸ In this context, the mechanical dimension of textile production and creation raises several questions. Does its systematization in the industrial age constitute a cultural break or, conversely, the fulfillment of principles that*

were present from the outset in textile theory and practice? What is the specificity of textiles within the vast set of matrix arts? Can we attribute them with a paradigmatic value that would make it possible to draw a line back from the algorithmic structures of computer science and digital imagery to the earliest looms? Lastly, in the mechanisms of textile production, is individual invention inhibited or conversely stimulated by technical constraints?

Jean-Paul Leclercq. The near universality of textiles makes them an illustration of the human capacities for combination and manipulation, with a likelihood of parallel inventions,¹⁹ in which the temporal rhythm of manipulations – which relates to music – is transformed into a spatial rhythm with the vast interplay of permutations on several different levels of organization that generates a woven design, leaving manual methods aside. Here is matter for mathematical research relating to algebra, topology and geometry – the theory of satins gave rise to encryption algorithms – and an invitation to work on the comparative aesthetics of space and time (LECLERCQ, 2008).

The very many intriguing technical similarities between textiles of the Old World and pre-Columbian textiles raise the question of parallel invention, waves of settlement (and in what direction: might we find movements from America back to Asia?) and – you never know – retro-engineering drawing on textile flotsam carried by the currents.

With the similar items obtained in basketry, such as the reed mats of the Marsh Arabs, mathematically speaking, through its passing under and over, warp and weft weaving is a matrix of 0 and 1, reflecting the binary logic on which computer science is based. The matrix of warp and weft pattern steps in fabrics with woven designs recalls the photosite matrix of digital sensors and the pixels of the resulting image. Figured fabrics, whose interlacing can be regarded as an often many-layered mathematical matrix, themselves result from several other matrices, graphic and/or mechanical, that notate or produce the passage over and under of the warp and weft, which are complicated by warping if the warp is made of different threads or simply threads with a different warp take-up and by shuttling order²⁰ if the weft varies.

For the brave, on paper or screen, from the plates of the *Encyclopédie* (1772) to our softwares for computer aided design and manufacturing such as Pointcarré and Arahne, there is always an orthogonal draft for the threading or passing of the warp threads through the eyes of the heddles of the shafts, for the weave or tie up from treadles to shafts and for treadling. This draft notates the action of the individual threads as they are raised or lowered, which produces the basic interlacing of the fabric. On ruled paper, and now also on screen, the design of figured fabrics is notated as a point paper plan, which sets out the work of the draw or of the Jacquard mechanism, by thread or group of threads (warp pattern step) and for each weft pass. Yet another matrix – this time on the loom, the figure harness tie through the comber board – governs the raising of the leashes by the draw (or later the Jacquard mechanism) to produce a design that varies across the entire width of the cloth (single repeat pattern), or is divided into straight or reverse repeats if the pattern has two or more repeats. The point-paper plan and figure harness tie provide the pattern for the matrix of lashes on a drawloom or the punched cards with several rows of holes for the Jacquard mechanism, determining which warp threads are raised as any given weft thread passes through.

It would be illuminating to present figured cloths and textile machines in tandem with a computer aided design station driving a sampling loom, for practical work at all levels, with the curator checking and illustrating his textile analyses, five-year-old children discovering – and understanding – the world of textiles, and designers and stylists doing tests, in a productive breakdown of the barriers between different types of visitor.

The matrix arts (LECLERCQ, 2014b) – which I theorized in the strict sense on the basis of the technique of creating inscriptions and decorations on bells, but which are manifested most acutely in the weaving of figured fabrics – are subject to a high degree of constraint, the effects of which are worthy of study, like the constraints affecting other combinatory arts involving discontinuous variation. We should note that in this sense weaving is an art of discontinuous variation, tempered by the continuity of the threads under the bindings, the different tensions that result and the curving of the threads generated by the weave. The design of a woven figured fabric results from interlacing and is not a surface pattern, printed on fabric or paper.

This invites us to generalize and to study the effects – aptitudes, limitations and circumventions – of different techniques and materials on the creative process and the results obtained. Such an approach looks for traces of the process that generated the work. It seeks to reconstruct the reasoning that guided its production, to the point of uncovering its weaknesses. It is based on what the work manifests, in intention or in fact, and on what has also been preserved of the stages and tools of its creation, which the cloth may elucidate. The Arts décoratifs in Paris holds sketches and point-paper plans for bordered waistcoats of the *habit à la française*. While at first sight their interpretation seems difficult, it becomes easy once you have seen on a fabric woven to shape the unassembled pieces of a waistcoat and identified the principle of an asymmetrically brocaded pattern woven on a loom mounted for a point repeat pattern. Because brocading is manual, it can be asymmetrically confined to the required areas, despite the symmetrical effect of the draw (LECLERCQ, 2012a, 2014b).

The principle of the *deconstruction* of fabrics is also something that art historians, designers and manufacturers all need to master. An important element of figured fabric production consists of reweaving and reusing designs. We can cite the slightly overenthusiastic Édouard Gand (identical weaves can be obtained on different looms): “If I were not afraid to use a comparison from too elevated a field, I should evoke here the name of a celebrated man and say, just as Cuvier reconstructed an animal from an extinct race on the basis of a fossil bone, so, with a simple piece of cloth, the skilled producer can reconstruct the loom on which the fabric was made.”²¹ Once this threshold of validity in the technical analysis – unique in the history of art – has been reached, it is very tempting to stop there, the more so when the curator is not himself able to carry out the analysis and runs the risk of being unable to use it to think about and through textiles.

But the great successes such as that of Philippe de Lasalle²² in the 1770s often resulted from skills in designing both fabrics and looms, through a methodical exploration of the possibilities of the looms that the firm had available or conversely by designing necessary adaptations.

The current decline of mechanical construction in France is a limiting factor. Conversely, computers and electronic Jacquard mechanisms offer entirely new capabilities that creators can use to be both designers and producers, at least at the stage of sampling or creating single pieces. However, there is a need for caution to avoid the trap of hastily turning photographs into cloth by means of Photoshop, textile CAD and a loom with an electronic Jacquard mechanism. These concerns echo those expressed in 1882 by Édouard Didron, in his report on the fabrics of the 7th exhibition at the Palais de l'Industrie by the Union centrale des Arts décoratifs, in Paris, in which he expressed unease at the overdevelopment of the technique of Jacquard devices, which released textile design from all constraints.

RÉMI LABRUSSE. *The textile field is described not only by its production mechanisms, but also by its uses. You have shown that these two aspects are inseparable: the same production system (in terms of techniques and materials) can create different visual effects, which can be linked to different uses and so to meanings that vary over time and space. Conversely, the same visual effect and its associated meanings can be produced using very different techniques and materials. Your curiosity about the interaction of techniques and civilizations has led you to develop an anthropology of dress, particularly that of men. You are also interested in phenomena of appropriation and rejection operating between Europe and the "Orient" in the textile field. You regard it as crucial to link the technical and material history of textiles to the history of fashion and cultural transfer. But using what methodology and with what potential results?*

Jean-Paul Leclercq. We must be very careful to distinguish between intended, actual and perceived properties, and remain cautious in stating their meanings. If satin, which is glossy, is much used in lingerie, this is less due to its behavior in light and more because it is smooth and doesn't cause garments worn over it to ride up when the wearer straightens up. This aspect was mentioned in 1769 by François-Alexandre de Garsault in *L'Art du tailleur* in relation to the backs of waistcoats, which should not be made in velvet to avoid lifting the *justaucorps* of the *habit à la française*.

I should like to mention a proposal for an exhibition which I put forward in 2001, as part of a program of different approaches spanning several years, "Phylogenetics. Textile and costume, aspects of the evolution of cultural diversity". Cultural evolution can to some extent be analyzed in a similar way to that of animal and plant species.²³

In this period of frantic globalization, we need to examine the current and past evolution of human cultural diversity, looking at the role of exchanges and endemic developments, the variable combinations of evolution and ossification or stabilization, emerging phenomena, diversification, extinctions and resurgences. Will very populous countries like India and China be able to evolve and establish their own way of doing things without a sometimes dangerous emphasis on identities bound to the past, or will they become part of a generalized westernization? I briefly raised this major question in relation to the exhibition "Anni Albers 1899-1994" (LECLERCQ, 1999), proposing a model of development combining autonomous local groupings and networks of long distance exchanges that would facilitate a happy marriage of cultural belonging and individual freedom.

The *habit à la française* became widespread throughout European society in the last third of the 17th century. At that time its ceremonial variants were something new; by the end of the 18th century they had become expressions of an old style; under the Empire they represented an assertion of respectability. Derived forms survive,

ossified and isolated, in civil and military uniforms, at the highest levels of society, and in the liveries of the staff of great houses. This trajectory is more or less what can be observed among some species of insect that lived on the plains in France at the time of the last ice age and now survive in separate, sometimes diversified populations in Scandinavia and at high altitudes in the Alps and Pyrenees. Similarly, regional costumes relate to different periods, when they became ossified, whereas historicism such as that of the Swedish national dress promoted by Gustav III of Sweden was an attempt to reconnect with a lost past and marks a break.

There is an urgent need for a historical exploration of the construction of forms of dress that are today experienced as an aspect of identity, in order to bring in a little relativism. Styles of dress are not eternal and are often constructed from imported elements, including religion itself.

In analyzing the wardrobe of a lawyer we find the synchronic cross-section familiar to students of linguistics: the professional robe, a survivor of the fashion for doublet and hose, hangs alongside garments of different, more recent periods – the three piece suit, tuxedo, parka, ski-wear, Bermuda shorts and so on. Similarly a Bastille Day parade brings together military uniforms with chronologically heterogeneous referents.

A diachronic analysis is also interesting. Tapestry, embroidery, printing, weaving, lace and knitting all take directions that draw them closer together or further apart in cycles and groupings that differ according to the period and field. The leading art may be textile-based, such as embroidery for woven or printed bordered coats and waistcoats in the 18th century, or it may be architecture and its offshoots, painting, goldsmithing and woodwork, in the case of 15th century religious embroidery with its architectural grounds. The comparative progress of the different arts is captivating. It would be productive to trace the development of the chasuble over three and a half centuries. Its form was fixed in the early 17th century, but its decoration reflects a series of fashions with different echoes from one period to the next. Nor should we forget the diachronic approaches discussed in 1998 in *Touches d'exotisme*,²⁴ nor, in combination with diachrony, imports such as Chinese clouds (*tchi*), imperial fritillaria, *toile peinte*, cashmere shawls, the silk industry that became central to the identity of Lyon, West African wax prints, and Christianity which has become part of the identity of the West.

But this is a historian's way of seeing. Motifs survive the forgetting of their symbolic value or functional origins. How much understanding do we now have of the things we wear or the textile décor we live in, or of the way that the circuits of production and distribution affect our freedom of choice and our understanding of it?

RÉMI LABRUSSE. *How do you see contemporary uses of textiles? Spectacular scientific advances in the field of technical or "smart" textiles go hand in hand with a no less spectacular decrease of woven fabric decoration, notably in interior architecture. Similarly, the drastic decline of domestic weaving threatens our capacity to combine our perception of textiles with an understanding of their structure and mode of production. What are the consequences of this resurgence of the old divide between the technical and aesthetic in a field which precisely symbolized the meeting of the two?*

Jean-Paul Leclercq. We must fight against this division – unless the split between “decoration” and technical textiles becomes equivalent to the divergence between

architects and engineers that drove the rise of metal in architecture in the 19th century.

When creativity is fertile and finds uses and clients, the role of the museum can be confined to collecting significant works and providing information about them. When creativity is good but struggles to be visible and find its place, museums can usefully display a reasoned anthology and illustrate its possible uses, inviting ideas from architects and designers, who will then become aware of the new products. When creativity is stalled and tends to be confined to the eclecticism of revivals, as under Napoleon III but without the talent and quality, and the modernity that marks a break is the legacy of the Bauhaus, it is up to museums to invite the right kind of projects, based on functional issues that are strong enough to generate a style and aesthetics, rather than being masked by them.

Textiles can now be used for their hygroscopic, thermal, sonic, optical (distribution of light), visual (well-being) or “smart” properties. The time has come to rethink textiles – including contemporary tapestry, which is too often forgotten – in relation to bioclimatic architecture, which they can of course enrich with the pleasures of seeing the play of sunlight differently magnified depending on the time of day, season and weather (snow, sun on wet cobblestones). Here is an invitation to design textile art installations for particular latitudes and climates, focusing on the right times and seasons, so that they are perfectly appropriate to the place and the life that is lived there, not forgetting plants that reveal the wind through the movement of shadows. The shadow dance of coconut fronds in the intermittent breeze of the trade winds is as restful as the sound and sight of the waves rising and falling on a beach. But it needs a screen to play on, and this could be a textile that allows the eye, light and air to pass through. In the absence of a tree to create shadows, a similar effect can be simply created using appropriately designed textile panels arranged on two or more different planes...

RÉMI LABRUSSE. *Thinking through textiles: can we give a precise, non-metaphorical meaning to this phrase? What type of thought is produced by the analytic observation of textiles and what can it explain, beyond textiles themselves?*

Jean-Paul Leclercq. To innovate it is often better to construct your discipline on the basis of the holds or handles offered by your chosen object, rather than imprisoning yourself in a pre-established framework, even if it means breaking with habits, struggling to find a thesis advisor and a jury – a museum curator is not bound by that obligation – and surprising people, which is one of the duties of museum curators when they aren’t doing another part of their job, which is to offer the public an expected retrospective such as “Fashion Forward. Trois siècles de mode (1715-2016)”, now on at the Arts décoratifs.

The “history” of art should of course be understood in the etymological sense of the Ancient Greek word as “research into” – the sense it has in “natural history” – and not only in the chronological sense, as in literary history. It should never be confined to a historical approach unless by deliberate choice and when textiles are sufficiently understood for us to know what to write the history of (LECLERCQ, 2007).

The holds offered to observation by each work (LECLERCQ, 2012b²⁵) or field of art require us to think in different ways. The presence of coats of arms leads to the consultation of works of heraldry. Objects worked in gold and silver gave rise to

collections of hallmarks and maker's marks registered on plates, and then to illustrations of the work of goldsmiths in a guild under the Ancien Régime, and to the manufacturer's catalogues of a major 19th-century goldsmith, with holds similar as those provided by catalogues of decorative cast iron. The chefs de pièce²⁶ of printed fabrics have similar attractions; their numbered designs are the delight of textile historians, who are even happier when the design is signed or reflects current events. There is a great temptation to consider only those aspects of a work that allow us to date or attribute it, to identify the person who commissioned it or the origins of the iconography, and other reassuring historical researches in relation to a work of art.

But is a fabric's merit increased by its confirmed attribution to Dufy, or Dufy's by the fact that he created an excellent fabric design, which we must be able to assess and involves curators? It is productive to alternate our approaches – textiles as an auxiliary study to history and history as an auxiliary study to that of textiles. What textiles have to tell us varies from one approach to the other.

Let us look at the work.

Cashmere pivot shawls of the mid-19th century are fascinating for their dynamic design.²⁷ This opens the mind to considerations of their weaving technique, costly in terms of the number of cards required, but easy on a Jacquard loom, by turning the cards over left to right when half the shawl's length has been woven, and reversing the direction of rotation of the Jacquard mechanisms to weave the second half. Left/right inversion was also used on drawlooms making fabrics with drop-reverse design in the mid-18th century. It was facilitated by the invention of the Sieur Maugis in 1758, described in Diderot and D'Alembert's *Encyclopédie*,²⁸ with point-paper plans that initially seem incomplete, but are completed when read for a second time in the opposite direction, or using the Maugis device.²⁹

And here we enter the vast domain of graphic permutations, the ease of which varies from one textile technique to the next – something generally ignored by ornamentists. Cashmere pivot shawls are a particular example of symmetry around the central point, which is present in many arts of interlacing, in all civilizations, periods and techniques, drawn or mechanical, when they are subject to a strict alternation of interrupter/interrupted, over/under: a rectangular piece of interlacing cannot be symmetrical along two axes intersecting at 90°, but it does have radial symmetry; in other words if it is cut through the center in a straight line, whether that line be horizontal, vertical or oblique, one half can be reconstructed by duplicating the other half and turning it 180° or by duplicating it left to right and top to bottom. This graphic permutation is not necessarily the technical permutation used in manufacture. In the weaving of a pivot shawl the line of inversion and the reversal of the direction of rotation is always in the sense of the weft. This bears no relation to the manual creation of symmetry around a central point in ceramics, brassware, and so on.

This is how, by thinking about textiles, we come to think through textiles, going from one field to the next, and developing a comparative approach to matrix arts.

The main thing is to remember that every domain offers its own holds for thought, inviting approaches that can be usefully transferred to other domains where they have been little practiced because others have proved stronger.

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NOTES

1. Including Jean-Paul Leclercq, "Acquisitions", in *Revue du Louvre*, 3, 1998, nos. 11, 18-24 and 72-73; 4, 1998, no. 47; 4, 2001, no. 78; 3, 2002, no. 47; 2, 2003, nos. 52-53; 2, 2004, nos. 67-72.
2. Fond du patrimoine.
3. It is obvious to all that many fabrics look different depending on the angle from which they are lit and viewed, and the direction of warp and weft, but this area of research has remained unexplored since *La Théorie des effets optiques que présentent les étoffes de soie* by Michel-Eugène Chevreul, Paris, 1846. The same damask may show a lighter design on a darker ground or vice-versa, or the design may not stand out against the ground. Seen and lit in line with the warp, a

shot taffeta is the color of its weft; seen and lit in line with the weft, it shows the color of its warp. A chameleon taffeta changes color depending on whether it is seen and lit in line with the warp from above or below, and appears as a third color if it is lit and seen in line with the weft. A white satin looked at in line with the warp takes the color of light coming from the opposite direction, and so on.

4. Previously in Edmond Goblot, *La barrière et le niveau. Étude sociologique sur la bourgeoisie française moderne*, Paris, 1925.

5. The academic conference held in tandem with the “Jouer la lumière” exhibition: *Jouer la lumière le textile, la lumière et l’œil. L’effet visuel de la lumière sur le textile, un champ pour l’innovation ; enjeux, état de la recherche, propositions méthodologiques et démonstrations*, symposium papers (Paris, musée de la Mode et du Textile/Centre français de la couleur, 2001), Paris, 2001 (bibliothèque des Arts décoratifs, MD 1598).

6. The Goniophotoscope® comprises a circular table 1.15 m in diameter with triaxial 360° rotation and a square 60 x 60 cm glass window for backlighting, plus two articulated arms with spherical concentric motion, both for 360° oriented and ±170° incident lights or imaging devices: the material, light sources and imaging devices can be positioned independently (notation in a 3D hyperspherical coordinate system). There is also a removable articulated arch for close imaging. This device can be used for free direct visual examination, for imaging with any type of camera, or for color measuring with any colorimeter or spectrophotometer. Concept: Jean-Paul Leclercq, “Les jeux de la lumière et du textile, un champ à explorer”, *Cahier technique*, in *Lux, la revue de l’éclairage*, 216, Sept.-Oct. 2002, p. 58-64.

7. Édition Numérique Collaborative et CRitique de l’Encyclopédie, ENCCRE: <http://enccre.academie-sciences.fr/>.

8. Gavin Maxwell, *People of the Reeds*, New York, 1957; Wilfred Thesiger, *The Marsh Arabs*, New York, 1964.

9. “Riom. Utilisation architecturale du fer”, exhibition at the Musée Mandet, Riom, 1983.

10. I returned to the work of Pierre Gourou, *Pour une géographie humaine*, Paris, 1973.

11. See Friedrich Christian Lesser, *Théologie des insectes ou démonstration des perfections de Dieu dans tout ce qui concerne les insectes*, The Hague, 1742; Louis de Jaucourt [a.k.a. chevalie], “Ouvrages de l’art & de la nature, (Science micr.)”, in Denis Diderot, Jean Le Rond d’Alembert, *Encyclopédie...*, XI, (1751-1772) 1765, p. 722-724; Joubert de l’Hiberderie, *Le dessinateur pour les fabriques d’étoffes d’or, d’argent et de soie*, Paris, 1765, p. 98-99; Jules Michelet, *L’insecte*, Paris, 1858, chapter xv, “De la rénovation de nos arts par l’étude de l’insecte”, p. 189-197. His ideas were far in advance of René Lalique, who confined himself to reproducing insects in jewelry, or Émile Allain Séguy. On bio-inspiration see Serge Berthier, *Iridescences. Les couleurs physiques des insectes*, Paris, 2003.

12. Jean-Paul Leclercq, “Mode, lumière, regard, triade d’avenir ?”, in *Revue des deux mondes, La mode. La passion de la création*, I, July 2001, p. 96-103.

13. In the sense of the field covered by the Ministry of Culture and Communication. Despite the establishment of Universcience, national museums established under the aegis of other ministries, Arts et Métiers, Histoire naturelle, and Marine and Armée, do not seem to be part of the official field of “Culture”. Literary specialists readily boast of their lack of scientific or technological culture.

14. Musée des Manufactures de dentelles, Retournac; Soieries Bonnet, Musée de l’Industrie de la soie, Jujurieux. The equivalent was sadly lacking in Tours, where the planned museum of silk manufacture, in the premises and with the machines and collections of the Le Manach company, collapsed in 2009, leading to the declassification of the looms in storage, which were dismantled in 2012, and the dispersal of other machines.

15. The only reconstructed drawloom in France. See Diderot, d’Alembert, (1751-1772) 1772, cited n. 11, XI (planches), *Soierie*, pl. LX-LXII, XCI-XCII.

16. Les Arts décoratifs, Paris, fabric length acquired in 1997, inv.997.2.12. The author's unpublished research.
17. Centre national de la recherche scientifique, France's national research center for science and the humanities.
18. "La seule définition complète qu'on puisse donner d'une étoffe, et peut-être d'un ouvrage de mécanique en général, c'est d'exposer tout au long la manière dont il est fait", "Damas", in Diderot, d'Alembert, (1751-1772), cited n. 11, vol. IV, 1754, p. 614.
19. See "Siamoise à bâtons rompus", three colors (LECLERCQ, 1999, fig. 6; LECLERCQ, 2008, fig. 15, p. 64), in *Collection de Toiles et Toileries*, book of samples from an industrial survey, Héberville, généralité de Rouen (district of Rouen), c. 1790, Paris, Les Arts décoratifs, p. 329. Fabric based on a color and weave effect using the binary properties of the tabby weave, which are propitious to parallel invention and reinvention across the centuries and in any civilization. A similar color and weave effect was identified in pre-Columbian Peru in Raoul d'Harcourt, *Les textiles anciens du Pérou et leurs techniques*, Paris, 1934, p. 20, fig. 6, and pl. I, fig. 2, caption p. 125 (Paris, musée du quai Branly, inv. 71.1932.22.2), which inspired Anni Albers for her *Pictorial Weavings: Two*, 1952, Bethany, The Josef and Anni Albers Foundation.
20. Warping is the preparation of the rolls of the warp; warp take-up is the difference between the length of the warp and that of the fabric, the latter being shorter due to the need for the warp threads to pass over or under the weft; shuttling order is the order of passing of the weft under and over the warp.
21. "Si je ne craignais pas de prendre une comparaison dans un domaine trop élevé, j'évoquerais ici le nom d'un homme célèbre, et je dirais: de même qu'avec un os fossile, Cuvier reconstituait un animal dont la race est éteinte, de même, avec un simple morceau d'étoffe, le fabricant habile peut reconstruire le métier sur lequel a été fait ce tissu", Édouard Gand, *Cours de tissage en soixante-quinze leçons professé à la Société industrielle d'Amiens*, Paris, I, 1886 (3rd edition), 5th and 6th lessons, p. 71.
22. Lesley Ellis Miller, "The Marriage of Art and Commerce: Philippe de Lasalle's Success in Silk", in *Art History*, 28, April 2005, p. 200-226; see "Philippe de Lasalle, l'artiste des Lumières" on the website of the Musée des Tissus: <http://www.mtmad.fr>.
23. See George Howard Darwin (astronomer and son of Charles Darwin), "L'évolution dans le vêtement", in *Revue de l'Université de Bruxelles*, March 1900, illustrated translation of "Development in Dress", in *Macmillan Magazine*, XXVI, May-Oct. 1872, p. 410-416.
24. Jean-Paul Leclercq, "Exotismes et soieries", "Quelques mots d'exotisme textile", in *Touches d'exotisme*, Sylvie Legrand-Rossi (ed.), exh. cat. (Paris, Union centrale des arts décoratifs, musée de la Mode et du Textile, 1998), Paris, 1998, p. 18-39, 218-222.
25. François Croco, Paris, "First Napoleonic pattern. Figured waistcoats", a cloth for historians in his sample book for the 1855 Universal Exhibition.
26. Manufacturer's marks printed at either end of each piece, indicating elements including the company name, the name of the maker, the place it was made and the number of the design.
27. See Cashmere pivot shawl by Maxime Gaussen, probably patterned by Amédée Couder, Paris, c. 1844, Paris, Monique Lévi-Strauss's collection no. 40, illustrated in Monique Lévi-Strauss, *Cachemires parisiens 1810-1880 à l'école de l'Asie*, exh. cat. (Paris, palais Galliera - musée de la Mode de la ville de Paris, 1998-1999), Paris, 1998, no. 13, p. 50, 113.
28. Entry "Soie", in Diderot, d'Alembert, (1751-1772) 1765, cited n. 11, XV, p. 286 and 291.
29. See Natalie Rothstein, *Silk designs of the Eighteenth Century in the Collection of the Victoria and Albert Museum*, London, 1990, point-paper plans, Lyon, L. Galy Gallien, nos. 290-296, 298, 1762 and ca.

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Mots-clés: musée, collection, textile, arts décoratifs, arts à matrices, matrice, technique, méthode, sciences, production, usage

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