

# Matter Still Matters. Design Education for a Material Culture in the Immaterial Age

Following the teaching experience developed for more than two decades within the design *curricula* of the Scuola del Design del Politecnico di Milano, between 2015 and 2016 a small group of scholars [1] – sharing the common experience of teaching design fundamentals for university novices attending first year design courses – committed to a reflection to refine certain pedagogical elements to foster a coherent, rich, and grounded basis for local design studio courses intended for design newcomers.

Addressing needs frequently expressed by novice students exposed to design fundamentals at the very beginning of their university *curriculum*, the group study interests were meant to condense and coagulate a disciplinary, although multifaceted, recognition of the factors grounding a dense sense of design that could be articulated on the terrain of the tangible substance of things and of the relevance of the human dimension [2] of the relation with matter.

To better inspire and guide design learners to fully understand (and exploit) the meanings and opportunities of materiality – as well as to cope with the counterpart claims of immateriality – it was assumed that approaches to product design for novices more than ever advocate an integrated approach to the study of physical attributes of materials entwined with the meaning of the profound *humane* experience with materials themselves.

This contribution focuses on some commentaries highlighted during the collective scholarly reflection.

## FOREWORD: STARTING FROM THE PARADOX OF IMMATERIALITY

The recurrent arguments of immateriality, with its claims for shapeless functions and for information as raw material, continue occurring in a pervasively tangible world: people are surrounded by a universe of tangible artefacts, where relations among people, and between people and their world, are mediated by the concrete shape of artefacts and the tangible attributes of materiality.

The assumptions of a forthcoming design culture, as well as its related design education at university levels, to be built on the all-pervading pre-eminence of immateriality are rather paradoxically faced with the dominance of materiality: technological development and material innovation have opened wide a limitless horizon for natural and artificial

material properties. Scientific research is constantly addressing ways to manipulate materials, even at the microlevels of atoms and molecules, to obtain material properties which are different from macroscopic qualities. The surrounding world is still firmly rooted in the physical substrate of matter, be it natural or artificial.

Clearly, technology's immaterial impact – either traditional or innovative – on people's daily experience has enormously increased over time. At the same time people are still immersed in the tangible properties of materials shaping products and product systems.

Objects generated by simple or complex technologies have always existed. However, the last three decades have witnessed the novelty of an all-pervading stream of conspicuously technological products whose material substrate seem to have progressively been reduced in favour of increasing immaterial and virtual performance [3]. For decades, the

impact of technology as informatics, electronics, robotics, bioengineering, advanced material technology, and so forth has been largely interpreted as the agent driving the system of products towards the contraction of its material substrate to be substituted by immaterial processes and services (Maldonado 1992, 9-84).

The claims advocated by policies of sustainability, in turn, have addressed dematerialization as the strategy for sustaining ways by which material product functions may be beneficially converted into immaterial performances via information products, community products, or duration products, as seen by Manzini (Manzini, Vezzoli, 1998). The discussion has continued, and still goes on along different trajectories, partly shifting also to the new sense to be recognized for the conceptual aesthetics of social design, according to Koskinen (2016, 18-29) who identifies a parallel between post-war art and the condition of current social design. Koskinen observes that artists dematerialized their art to include activities, events, happenings, and performances, as well as language and information in conceptual art alongside social relations. Like post-war artists, current social designers would show that it is possible to dematerialize design to the point that material reality does not disappear but may become a marginal issue.

From the perspective of product design – in particular – the claims of dematerialization have largely implied a progressive emphasis on product performance through its communication and information components, overcoming more traditional perspectives grounded in tangible functionalism (Bassi 2010).

Nevertheless, the empirical and social understanding of materials (Drazin and Küchler, 2015) as well as the tangible, human relation with the substance of things remains the main part of the process of constructing the world, where everything is made up of stuff: objects, personal belongings, and devices, whether technological or not. People are surrounded and pervaded by material persistence. Of course, materials have not only physical attributes: they have social dimension [4] and economic value, as well as perceptive and sensory qualities. Not only sight, but also touch, smell, taste (Miodownik 2008), and the sound of materials may provide sensations of pleasure, resistance, displeasure: we may like to see, touch, or feel materials and utterly dislike them. Sounds and noises produced by material consistency may address our senses and they may play either the sound track of familiar daily routines or the resonance of extraordinary manifestations. Natural materials may have a scent, such as the common experience of fresh wood fragrance. Furthermore, materials are emblems, stereotypes of preferred performances: steel is unbeatable, cement is fundamental, glass is invisible, porcelain is sophisticated, plastic – as in Miodownik (2015, 124-125) – is “imaginificent” or, in common perception, also cheap.

#### A LOCAL BACKGROUND TO EMBED THE *MATTER*

A long lasting tradition of studies articulating the broad sense of a culture of materials can be traced at Scuola del Design del Politecnico di Milano [5] and – on the other side –

debates occurring alongside the transition to a dematerialized world of service and product performances have surely largely influenced local university *curricula* developments since the Nineties. At the same time, only scattered and rather dispersed pedagogical intentions and actions have been formally re-elaborated at both theoretical and applied levels, partially neglecting the core basics of a possible, revised approach to design fundamentals for novices, aimed at reconciling the claims of dematerialization with the consistency of the socially-embedded materiality of the tangible world in which people continue being immersed.

Further, the in-progress, quickly-proceeding disciplinary developments of material science and technology largely provide the convenient framework to understand materials from a technical point of view, without being sufficient. As future designers, design learners may be expected to understand materials with their hands and brains, as well as by means of the complex of sensory experiences, social behaviours and narratives that matter generates. As Miodownik (2015, 198) points out, we may well know physical properties of china but we cannot neglect considering that there is a sort of social stigma that inhibits one from serving tea in any other material if not chinaware. To drink a cup of tea is not merely sipping a liquid. It is a social liturgy and the celebration of a set of values. A cup made of porcelain is part of the valuable integrity of such a ritual. That is the reason why designers may be asked to ground and explore the selection of materials by exploiting both their physical properties and the related socially ritualized behaviours and sensory subjective experiences those properties may produce.

This is why a condensed reflection towards a shared concern for looking beyond objects and things to the materials which constitute them, with claims for considering both their substantial attributes and cultural meanings (Drazin and Küchler, 2015), was introduced as a task among the small group of scholars involved, aimed at sharing some key points for a design-led re-proposition of a *science du concret* (Claude Lévi-Strauss, 1962) alongside the desirable trajectory of an extensive, enriched, and multifaceted culture of materials for design beginners.

#### SETTING BORDERS FOR A CRITICAL COMMENTARY

In order to contextualize the critical commentary that emerged throughout this collective study, we deem it necessary to present a set of background information from which the shared reflection moved.

The new, emerging, and ever-changing fields of action of design in general were placed in the critical frame of view of what has appeared to be a weak and slightly defeatist destiny of the traditional product design culture. As sharply observed by Alberto Bassi, product design culture seems to be “destined to moving in threshold and lateral spaces in relation to the great questions (and economic powers) of our time. Moreover, in terms of the related numerous skills that may contribute to an object definition, the function of

design may appear partial and limited if seen as ancillary compared to the requirements of the market and business, which imply mandatory new solutions at any cost (in response to hypothetical market demands)” (Bassi 2010, 4).

The idea of weak destiny in the tradition of product design culture, also interpreted as an ontological crisis [6] by Cristallo (2015), has in any case developed in response to a modernity that – despite having a widespread reference to the virtual world – has not given up the physicality and tangible meaning of things, products, and systems that are and will stay at hand.

In this perspective, product design still maintains a crucial role in giving shape and substance to the goals that move and will keep moving people and markets. Further, its role continues being to use the project tools to deal with the many issues (Pizzocaro 2016a, 386) of the summation of tangible product functions; the technological-functional convergence into individual artefacts (either tangible or intangible); the permanence of single-function objects; the widening of the target user pool; the emergence and improvement of the rich testing front related to the product’s interactive potential (which integrates and completes the physical/material potential); the consolidation of research methods and design practices specifically targeted towards grasping and interpreting the needs and desires of people and modelling tangible goods thereby; the bolstering of tools and the definition of new types of objects in relation to emerging needs and identities of the products. In short, all the general issues that continue to affect an endless pool of concrete artefacts: some linked to past product typologies which have undergone unpredictable developments (how can the distance in meaning between a pen and an electronic pen, a simple shoe and a hyper-technological high-performance sneaker – that includes a little screen showing useful data to monitor running efficiency – be interpreted?); others, new items linked to a development category that may qualify them as neo-objects (Santachiara 1985) or neo-machines (unrecognizable, unidentified artefacts, black boxes with a purpose that is not explicitly announced, that go beyond the form/function dichotomy and shatter it); or others yet, in the capacity as technological super-objects (Bassi 2010, 8) which are physically overwhelming (how else can – for instance – the bulky presence of vending machines be described?).

#### MATERIALITY HAS NEVER FADED AWAY

It is with the expectation of a design culture to build upon the foundations of (presumed) intangibility that the contradiction with a remarkable tangibility in its strictest sense has been born: research and development departments are investing heavily upon the world of artificial and natural materials, in terms of a wide range of physical, tactile, and visual properties applied to a vast and heterogeneous pool of everyday objects and tools. A number of design concepts – inspired by the unprecedented tangible materials available – already foreshadow an outlook of further development of modern products. The perspectives in terms of scientific research include techniques

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for the manipulation of matter at an atomic and molecular level, which is bringing a radical change in the creation of objects with improved tangible properties and uses. These are different from the properties of objects that are linked to the macroscopic traits of natural materials but are equally and solidly bonded to the concrete physical nature of matter.

At the same time the vibrant claims from the approaches of anthropology and ethnography in their, one could say, *material turn* (Drazin and Küchler, 2015), together with approaches in which materiality is invoked across the humanities and social sciences, demand that both the specific properties of materials themselves and the social relationships activated through their technical use and circulation are taken into full consideration.

Beyond exploring the significance of materials by moving from questions of what may be created from them, richer perspectives are opening on materials representing a shifting ground around which relationships and identities of artefacts may constantly be formed and dissolved in the act of material use.

To understand materiality – and, conversely, the traits of immateriality – from the point of view of a beginner in the product design world, both the familiar human dimension of the substance with which things are made and the physical universe of matter with which he or she has no subjective experience must be interlinked. In such physical universe, the designer will learn – in a scientifically supported way as integrative to common personal experience – that some materials have a smell and others don’t, that some last thousands of years and others turn yellow and crumble under the light, and that the state of materials, as well as their properties, is unstable.

Everything is made of something: our clothes, the everyday objects we use, our devices, and our personal items, whether technological or not. Of course, our bodies are made of tangible substances, and the world of things has physical properties, a cultural dimension, perceptive and sensory abilities, economic value, and a symbolic meaning. The empirical understanding of materials remains – for those who approach design as an object of study or a profession – of crucial importance. The sensory relationship with the composition of things is one of the building blocks of our personal world: we love certain materials and hate others, we surround ourselves with tangible objects that may even have material contradictory performances: glass may be bulletproof glass, or it may break at the light touch of a finger.

#### MATERIALITY AND IMMATERIALITY SIDE BY SIDE

Once again in terms of the effects of a radical transition towards the intangibility of virtual reality and the perspective of setting aside materials as a whole, it has been observed how this would shift the role of design – an art that conforms and represents at the same time – towards the net domination of the representative function. Thus, design would be headed towards consisting in expressions of pure communication (De Fusco 2008, 12), although “the extent to which

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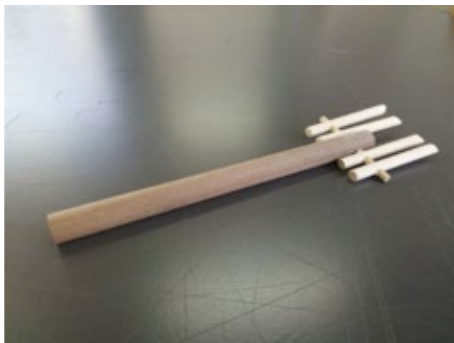
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Fig. 1. Lorenzo Fabbri



↑ Fig. 3. Alessio Gauzolino



← Fig. 2. Matteo Tagliabue



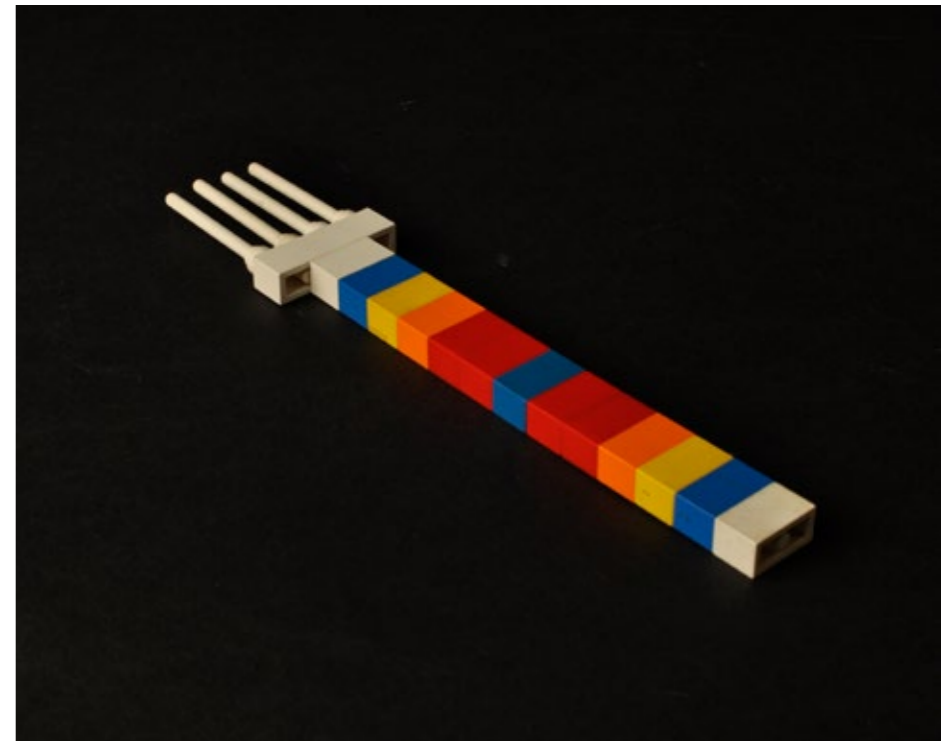
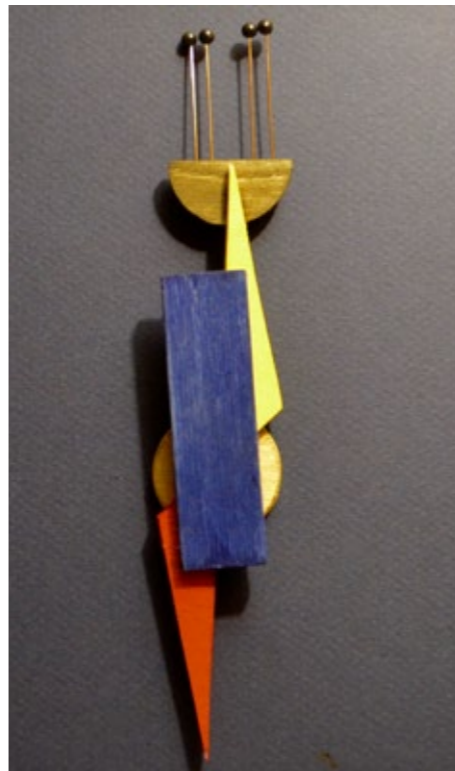
← Fig. 8. Claudia Morani



Fig. 4. Stefano Chenet



↑ Fig. 5. Elena Candelieri



← Fig. 9. Giacomo Fumagalli

↑ Fig. 10. Paolo Schirato

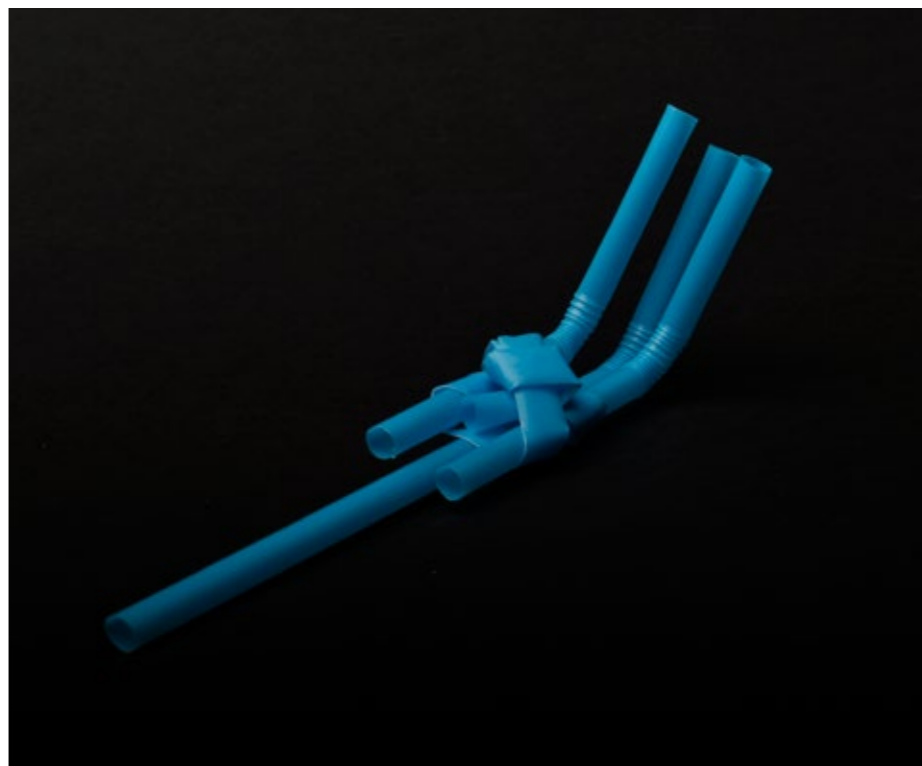
← Fig. 11. Sabrina Occhialini



Fig. 6. Caterina Regni



← Fig. 7. Sveva Solimene



Figures 1-14. Explorations of material expressive languages on a fork morphology. First year product design undergraduate students, Scuola del Design del Politecnico di Milano, academic years 2015-16, 2016-17.

the designer will be gratified by digitally modelling forms rather than physically modelling them is yet to be verified” (De Fusco 2008, 12).

As a matter of fact – as we may literally mean – the claims of immateriality, of function without form, of information as a raw material of design, continue to unfurl in a pervasively physical world: men continue being surrounded by a universe made of substance. Relationships between people, or between people and the world, are mediated by tangible objects, which are the product of human thought, culture, and activity. The invasiveness of physical objects is so high that – like never before – we bear their presence directly on our bodies (with a myriad of mobile and wearable technological devices) and in our bodies (by means of prostheses that replace organs or insufficient/missing bodily functions). Of course, the function of an object claimed by a traditional sense of functionality has changed or lost value: the symbolic meaning of the object has a functionality in a social framework, and this symbolic meaning is distinguished by traits that are no longer assigned at the moment of production, but, instead, when it is used and consumed. Therefore, rather than objects as such, there is an idea of objects in their use and promotion context, including what Marrone (2002, 15) would define *aesthetic promotion*. In terms of design as a discipline and practice, it would no longer be a matter of conceiving practical functions that agree with physical shapes: its task now extends to the prediction and the ideation of “one form of consumption rather than another, one form of promotion rather than another, assigning one sense compared to another” (Marrone 2002, 17). Assuming that nowadays the things surrounding us continue to be for the most part tangible, the expression “at hand” may be used not only to underline the effective closeness as a measure of the relationship between person and thing, but also to recognize the hand – and indirectly the sense of touch – as a driveshaft around which tangibility revolves.

Consider the manual movements through which we give a sense to materials: familiar actions including repeated motion of the mouse, held and dragged along the table top; the light pressure applied to the mouse buttons and keyboard; the stronger, firm pressure on switches; the light touch to engage buttonless surfaces; the grip – a combination of power and lightness – on writing tools; the dexterity required to handle work tools; the caress of a hand embracing the surface of an object.

#### MANUS COGITANS: MATERIALS “AT HAND”

The pressure applied by a hand and its fingertips to things also tells us the meaning of material manipulation: touching is a form of knowing; we constantly touch to better understand; we use touch when sight is useless or not useful enough. It is through touch that we recreate a sensory experience of material quality, with its macroscopic characteristics appearing directly liveable and recognizable.

Contact tells us of warm, cold, soft, flexible, hard, or stiff materials. Sensory traits related to touch don’t nec-

essarily have a direct correlation with technical characteristics. For example, whilst stiffness is directly linked to a property called stiffness – which is quantifiable and qualifiable – softness is not: a material perceived as soft, which bends or deforms, corresponds to an elastic behaviour, and the related property is named modulus of elasticity (Ashby and Johnson 2005, 77). By adopting a perspective that is focused on the centrality of the sensory experience, it is fundamental to consider the meaning that people give to a tangible concreteness of objects, for example tools, instruments, or other products.

This consideration may lead to a renewed analysis of any product use as an elementary action of appropriation of tangibility, and not just an extension of technical handling: using an object implies – in the dimension of tangible artefacts – a direct contact between man’s hand and the object itself. To use a physical object is – in theory – the beginning of a sensory experience giving a status of existence to the object used.

The movement of the hand, which we view as concrete and physical – both through the agility and strength required to use material tools, and with the unperceivable manipulation of touch screens – dominates both the world of everyday objects and that of technological devices, with which we control things, execute commands and controls, produce intangible inputs, and generate information and virtual functions, as witnessed by the persistence, on one hand, of the widely familiar dimension of handling everyday objects, but also the dimension related to typing or to the slight manipulation imposed by miniaturized devices, the soft touch with which the hand comes into contact with grippless interfaces. All such actions bring us back to the concept of the subject, or user, interface: the subject interface “is that which, for example in the case of a tool, facilitates manual grip, or facilitates the performance of a task in digital software” (Fontanille 2002, 87). The nature of a simple gesture (Leroi-Gourhan 1977, 282-285) that allows us to grab or hold everyday objects does not seem to undergo drastic transformations in terms of the functional complexity eventually embedded by technological artefacts.

The statement expressed by Tomás Maldonado in the past thus seems applicable at present: “there is thus no escape from the limit of physicality. [...] It is unreasonable to speculate [...] that men, in their everyday lives, may definitively get rid of the elementary and even, they say, too primitive and naïf demand to always and in any case touch the things in this world with their hands” (Maldonado 1992, 12). The use of things – in intuitive and immediate terms – is repeatedly linked to the movement of the hands, the touch of the fingers, or the precise sequences of actions and operations: the daily consciousness of using things is a routine and a reiteration of manual grip, a comforting repetitiveness or – conversely – a new and unpredicted transformation or an act of learning and a re-adaptation of actions. From the point of view of use, the first approach to an unknown, unfamiliar, or never used object produces a logical sequence of questions (Norman 1997, 112-113), prior to possible actions, where the hand is the protagonist: while the first doubt is “what is it?”; the second is usually “where and how can I hold this object?”; “what part of it must I grab?”; “where must I introduce or

lay my hand?”; “which actions can I perform with it – pull, push, rotate, touch, lightly touch, grab?”; “how much force must I apply with my hand?”; and to this we shall add “how does the object’s material influence the previous questions?”.

The pressure and grip of the hands and fingers narrates (Pizzocaro 2013, 45) a user experience that has been, and widely continues to be, a manipulation of both the object and of its tangible concreteness: to use is a form of knowledge, through the hand as the medium; only after having used an object do we truly know it, become familiar with it, and make its usefulness and its tangible properties our own.

#### FOR HUMAN AND HUMANE EXPERIENCES WITH MATERIALS

The formal and functional dimension of things, their *visible* appearance and tangible, visible traits have in most cases a central and inalienable role in terms of memory and conservation of attachment. Nonetheless, this is not true as a general rule. The *sight* of an object’s physical, concrete, and material substrate is certainly important, but it may take on a marginal role in activating the senses. It is not always sight that activates an experience or an emotion: all senses may contribute individually or in combination with others. Through perception –referred to here as the site of exchange between subject and object in which the first instance of signification is produced (Bolchi 1997, 39) – people are constantly triggered by a number of sensory stimuli that allow them to interact with the surrounding world. All five senses are potentially involved. The fact that our sight-venerating society gives little space to the so-called minor senses – hearing, taste, and smell – is simply the measure of a deficiency.

Visual information, constantly emphasized to this day, is thus not the only principle that informs about the nature of matter. Sound, for example, may also express the physical substrate of things, as can be done by smell or – as said – the touch of the hands and fingers.

The sounds and noises produced by the texture and properties of materials affect our senses as much as seeing them, and they emit both the familiar background noise related to their everyday use, as well as generating extraordinary moments of epiphany (Miodownik 2015, 19).

Sound may indeed provide information that is not otherwise accessible or may add sense and meaning. As Miodownik observes: “We know the sounds of the doors in our homes, and can distinguish between someone leaving or entering from the subtle differences in keys rattling and hinges creaking. As a child, I could always tell whether it was my mother or my father coming up the stairs from the subtle differences in the sound of the creaky stairs. These acoustic qualities of a home are important but often overlooked in bouts of home improvement. When we carpet over the tiles in the hall, we make it feel warmer, but lose our ability to announce our choice of footwear to the rest of the house. The click-clack of high heels and the imminent cocktails that they imply are no longer announced to those slumbering on

the sofa. The squeak of rubber tennis soles is banished and the comforting solid thump of sensible shoes on their way to work is no longer proclaimed. Installing carpet in the hall is a kind of auditory gag that stifles a house’s launch pad into the world” (Miodownik 2004, 13).

The ways in which materials resound (as opposed to the plethora of sounds and noises caused and generated artificially, as well as sound signals, off-screen music, and voices produced by invasive artificial sound reproductions) are important in that they describe not necessarily visible physical elements, but they express the internal functions: they speak of the way in which two or more mechanical components interact; of the acoustic relationships between empty and full; of the contact between materials of different textures; of the activation and interruption of power inputs. In the use of objects, noises are produced when materials interact concretely, when they encounter resistance or rupture, when they undergo forced actions and generate correct and incorrect functioning. Noise is also the sound emitted strictly by the materials themselves: the pitch of the material’s sound, its tones, and its dampening and clarity express acoustic behaviours that may be functional to the expected design result. Bronze, glass, and steel produce high-pitched sounds, while rubbers, foams and polymers emit dull, low-frequency sounds (Ashby and Johnson 2002, 80). The designer is thus asked to consider material sounds and noises with a clear understanding of the relationship between the material, the sound factor, and the effect or information conveyed.

#### EMPHASIZING THE PROCESS OF THE HUMANIZATION OF MATTER

The horizon of augmented material-centric design options may appear to us as a powerful field of exploration not only for the future – as a constantly updated repertoire of emerging performances offered and available by material innovations – but also from the past, in the valuation of material identities modified over time [7]. This is why the aesthetic reconsideration or promotion of used – here intended as both the dimension of effective wear of materials and their recorded use – materials may represent a valuable point.

The consequences and transformations of use, abuse, or disuse of the material substrate of products become the bringers of changes in material characteristics at an identity level. For people, the familiarity with the substance of things corresponds to a comforting routine of interaction and a deep relationship with one’s objects, owned and used fully in their functions, with appreciation or – not infrequently – affection. The profound relationship that connects us with everyday objects – a familiar presence in our lives – is no different; these include small objects and utensils we simply could not live without and would never let go of: personal items, belongings, and paraphernalia [8] full of meaning solely for the owner.

They are things for which, over time, we learn to acknowledge the shortfalls and defects, including the aging of their composition. Materials, like the objects they form,



suffer the effect of time on their surface, which is shown by what is commonly known as a patina, or the trace witnessing that the material has been used. This is the general concept of the well-known paper by Fontanille (2002), who reminds us that “in the strictest sense, the patina is a layer of copper compound that forms over time on the surface of objects including – in part – such metal. In a broader sense, the word is used to define any superficial and regular alteration to objects made of hard, stable, and usually unalterable materials over time. Therefore, a patina is both an expression of ‘time going by’ through use – engraved on the outer surface of objects – and an expression of ‘time lasting’, witnessed by the solidity and the permanence of materials and the internal structure of objects” (Fontanille 2002, 71). Patina is in fact the sign of a worn object. The quality of used objects catches the eye with a single look or touch: it is the manifestation of a reiterated everyday use, a memory of use that is engraved in the material with which the objects are made, or the progressive wear that makes the objects almost similar to one another and familiar, which is the result of a relationship with the people that use them and live with them (Fontanille 2002, 72).

It is a relationship that Fontanille (2002, 72) defines as *humanization*, by which the appearance of the objects ends up even slightly resembling the user: the patina witnesses a previous use of the objects, which bear “the trace of the bodies of those who have used them”, but for this reason contributes to the attraction towards using them, prefiguring methods and forms of future contact. The patina gives objects an inviting *familiar aura*. Of course, the fact that objects covered with a patina are similar to one another does not mean they have a common superficial appearance: each object reacts differently depending on the stress and uses it has undergone. The familiarity as analysed by Fontanille may be ascribed to a form of *complicity* (2002, 79-80), a distribution of common traits that create a formal and expressive language made of stains, signs, faded colours, traces, dents, missing pieces, torn threads, mismatched assemblies, repairs, technical patches, joints, and spare parts.

As a semiotic surface “that acts by retention and protention” (Fontanille 2002, 72), the patina essentially corresponds to the modification of the perceivable properties of objects (form, colour, texture), and in particular – again in the words of Fontanille (2002) – solid objects. The patina is a sign of wear, but wear that is not excessive, as the object may maintain its overall functionality unchanged.

The word ‘used’ has taken on a specific value in the language of trade. Consider the obvious examples of the many categories of objects that actually increase in market value in relation to the aura conferred to them by aging, or the unpredictable expressions of used materials in the fashion business, such as denim aged artificially to create new jeans with traces of wear, a ripped thread, or the faded softness of used pants. Nonetheless, the concept of ‘used’ outlined here goes beyond the sense that Fontanille ascribes to superficial alterations, in that we may apply it to the overall identity of the product and the gradual wearing transformation of its material qualities as a whole, which may gradually fail. In this case, once again, it is purely the existential – and not merely instrumental – depth of the *humane* sense of materials as a



← Fig. 12. Giacomo Brugiapaglia  
 ↑ Fig. 13. Rossana Mascioli

substratum of memory that can explain why it is so difficult for us to let go of our used objects. We continue to use them with their old-age patina, with their performance starting to fail, with their components starting to break, and with their material starting to deteriorate. The materials that objects are made of may express our behaviour over time and have the ability to suspend, syncopate, or interrupt the uniform unravelling of time itself (Connors 2014, 15). The marks of time on materials stop time, as they become anachronistic, but – though failing to alienate them from ourselves – the anachronism and the untimeliness of aged materials makes them, instead, more appreciated: how can one otherwise explain the emotional value and sense of affection exuded by the worn and yellowed pages of a book read over and over, or by an old letter, and on the other hand the emotional barrenness of a brand-new page?

Used – worn, deteriorated, dulled, corroded, oxidized – materials speak of the past, or establish themselves as an identity that sets the tone for the present with their dulled colours and deformed edges, where shape, texture, and colours have faded, and what has remained is the essence that continues to be a physical presence whilst connecting us with a loss of sense, of use, of *status*.

In contrast with the interpretations that exclusively emphasize the aspiration towards change, and the constant need and desire for something new at all costs, and

in contrast with the aseptic, cold aesthetics of high-performance materials that lack an identity and social recognisability, we can still report herein the relevance of stratified pedagogic frameworks for design approaches that may prove the relevance of material permanence and deterioration processes, along with real, concrete, and tangible contexts of materials use. This is, of course, less captivating than the evolving worlds and the expectations generated by the irruption and progressive dissemination of the remarkable outcomes of extraordinary effects and performances of materials by design, informed materials, or smart materials. For this reason, we believe it is not redundant to evoke the sense and importance of a pedagogical intention that can inflame a design conception that may in any case be linked to materials stereotypes and even imperfections in worn material performance, or that may encourage multifaceted analysis, deep understanding, and narration abilities when coping with materiality at the crossroads of past and present materials uses, signs of obsolescence, and forthcoming transitions, within a current relation with matter that is literally holding on to a tangible sense of materials (either outstandingly brand new or – conversely – traditional, forgotten, consumed, worn), in the context of an individual and collective everyday life that is strongly anchored to a materialized reality.



Fig. 14. Giulia Monguzzi

#### FOOTNOTES

- 1 - The intended collective study was meant to integrate the reflective teaching practices from five scholars' experiences within the first-year design *curricula* at the Scuola del Design del Politecnico di Milano, namely Silvia Pizzocaro teaching product design fundamentals, Antonella Penati teaching visual design fundamentals, Valeria Bucchetti teaching communication design fundamentals, and Cristina Tonelli teaching design history fundamentals. Their work was networked through the technology of materials perspective on behalf of the former scholar and colleague Cesira Macchia. The group reflection was partially condensed in a collective book edited by the author (2016).
- 2 - Technical, economical, productive, distribution factors related to the system of product manufacturing – although implicit and unavoidable in a design pedagogy for novices – were, in this case, intentionally left outside the reflection borders.
- 3 - The debate on dematerialization and design is often reported as originating from the exhibition by Jean-François Lyotard and Theodore Chaput, entitled *Les immatériaux* (Lyotard et Chaput, 1985), held at Centre Pompidou in Paris from March to July 1985.
- 4 - As claimed by Susanne Küchler (2015), ethnographies of materials use are "seeking to address the blind spot that materials occupy in social and historical sciences in the hope of paving the way for a new vocabulary and a new intellectual engagement with what the anthropologist Claude Lévi-Strauss has long ago identified as 'the science of the concrete'."
- 5 - Locally, the Scuola del Design del Politecnico di Milano academic tradition of design and materials studies goes back to mid '80s, with well-known Ezio Manzini's *La materia dell'invenzione* (1986) or with the pioneering innovation-led explorations carried out by Marinella Levi (Rognoli y Levi, 2005 y 2011). It is also worth mentioning – among many others – the anthropological approach to materials by Eleonora Fiorani (2000).
- 6 - Here we are referring to what has been sharply defined as an ontological crisis of product design (Cristallo 2015) and its presumed discomfort when dealing with contents and modes of inherent product design *curricula* at the university level.
- 7 - A long tradition of product design studies is largely concerned with issues of materials aging, with claims for an aesthetic quality of materials expressing meaningful experiences (Manzini, 1990; van Hinte, 1997; Fischer, 2007).
- 8 - In contrast with the sense of paraphernalia most commonly referred to as the equipment or apparatus used for a particular activity (Connor 2014, 21), in ancient Roman law paraphernalia o paraphernal goods, from the Greek *parapherna*, were a bride's own personal effects and belongings excluded from the bridal dowry. They were usually jewels or personal belongings the administration of which, but not the ownership, could be transferred to the husband during the marriage. Should the marriage be dissolved, they were to be returned to the bride.

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