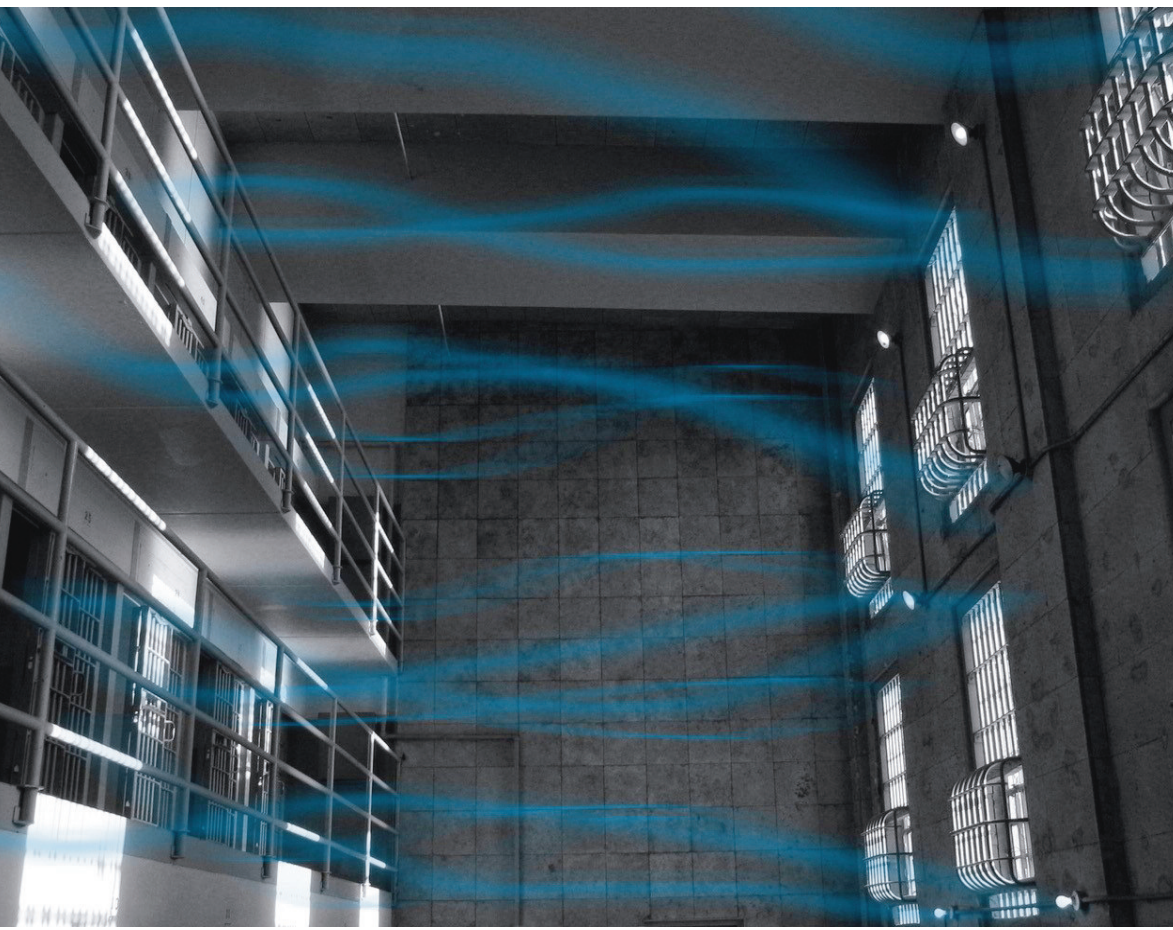
INVISIBLE ARCHITECTURE

The experience of place through smell

Anna Barbara and Anthony Perliss



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Olfactive Design. The birth of a discipline

Several decades have now passed since the publication of the book *Invisible Architecture – The Experience of Place through Smell*. What once seemed a field of research somewhat neglected by architecture and design, has over time become an emerging discipline and an increasingly promising professional practice.

In the years since the first edition, I have continued my research around the world, trying to understand who was working with air, as well as who was experimenting with smell in relation to design. Over the last 20 years, various paths of research dedicated to olfaction have emerged in design, products and services as well as in neuroscience to investigate the impact of odors on our brains; in behavioral psychology with applications in marketing, sales, experience; in chemistry and engineering of new products and materials; in mechanics for the design of small technologies and for diffusion both in the environment and the body; in therapies for health and care; in digital systems to convert material into immaterial. (Milotic, 2003), (Henshaw, McLean, Medway, Perkins, Warnby, 2018)

What used to be niche research has become a growing sector both in terms of quantity and quality.

The sense of smell is the only sense we cannot turn off: we can close our eyes, plug our ears, not touch, refuse food, but we cannot stop breathing. (Levi, 2012)

It is the brother of breath, as recited by the protagonist of Patrick Süskind's The Perfume. With air, smell penetrates our bodies, and we cannot resist it. Odors thus become vehicle for emotions, memories, illnesses, as well as desires. The dominance of odors is linked to the control of people and their emotions, which is why interest in this organ and its potential is still partly to be explored. (Nestor, 2020)

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All our senses respond to external stimuli, but only the sense of smell requires the input of world particles into our body. (Gorman, 1964) (Fuso, 2022)

The involuntary, internalized nature of smell is part of those qualities that make it intangible, profound, and intimate. (Levi, 2012)

In this sense, the pandemic has helped increase awareness on the existential role of this sense, not only on an aesthetic level, but also on a vital one.

Scientific literature shows that there are areas, such as marketing and neuromarketing, which are extremely interested in olfaction and aim at exploring its impact on consumer behavior. Olfaction is also key in immersive experiences frequently linked to museums as well as in retail to understand its contribution to physical experiences in highly digital and/or immaterial contexts. (Ischer, Baron, Mermoud, Cayeux, Porcherot, Sander, Delplanque, 2012), (Lupton, Lipps, 2018)

Olfaction in workplaces, healthcare, retail

The digital revolution we are experiencing makes this immaterial and immanent sense a cardinal tool of presence, through the physical experience of the places that house, even when they're digital, our bodies. For any experience, even the most virtual one, provokes emotions that affect our bodies. There are no places without smells, but there are places where the threshold is so thin that it is not perceived, or others where the smell or the sum of smells constitute an olfactory landscape. The question is whether the sum of the odors produces a cacophony or whether someone has designed the olfactory bouquet and the various odors compose a pleasant or disgusting result.

An olfactory education not only increases sensitivity, but also becomes an indispensable tool for designers to ensure that the invisible qualities of space are consistent with those of the other senses and are not out-of-control or even adverse variables.

The next generation of designers will have to acquire the sensitivity that Joseph Rykwert demanded of his students so that it is indisputable that designing a place does not only mean designing its image, exciting the sight, but also involving all the senses, which are the fundamental media for the experience of a place to be memorable, exciting, and necessarily coherent.

The digital revolution, which has realized some of mankind's primary desires, such as dematerialization, eternity, ubiquity, has found in the sense of smell its biggest ally and most performative sense.

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Andy Warhol wrote in 1975 in *From A to B and Back Again* that smell is really a means of transport, more so than sight and hearing, touch, and taste. It is the sense of smell that is the powerful medium in taking us elsewhere. Smells make us travel through time and space but also simultaneously here and there. (Warhol, 1979)

The sense of smell is often wrongly associated only with the luxury sector or with wellness and hospitality, but its effects are instead much broader and deeper, impacting and altering our psychology, our mental and emotional state, and our physiological condition. (Morrin, Ratneshwar, 2000)

Neuroscience is extensively investigating how olfaction inhibits or accelerates certain mental states or physical and physiological processes. New explorations are helping to discover how many of our behaviors are often reactions to olfactory stimuli. (Ruzzon, 2022) (Bitner, 1992) (Barwich, 2020)

The impact of olfactory stimulation is a performance enhancer in the areas of productivity, learning and concentration. That odors influence mood is a well-known fact, but scientific literature shows that they also influence job performance and behavior. Research data on workplaces shows that scented environments with diffusers reduce staff absenteeism and that well-oxygenated and ventilated offices increase productivity and cognitive functions by more than 60 per cent compared to the average. This is why the design of workplaces is strongly involved in this topic, both in introducing materials with olfactory characteristics, as well as in the design of ventilation systems that contemplate the possibility of acting not only on air, temperature, pressure and humidity, but also on fragrance. (Baron, 1990)

The results of research and experiments have made it clear that the impact of odors on our organism, on an emotional and behavioral level, can influence therapeutic aspects and reconfigure places of care, through olfactory design that, in certain spaces and at certain times, assists the cure itself.

All air qualities – smell, temperature, humidity, pressure – become therapeutic tools with which body and psyche can be healed.

The potential of the sense of smell in the treatment of certain senile diseases, from dementia to Alzheimer's, has been tested and measured. Olfactory disorders are usually detected in 85-90% of patients already in the early stages and worsen as the disease progresses. However, only 6% complain about this sense loss. Although in Alzheimer's patients olfactory disturbances are due to both peripheral and central deficiencies – with loss of the ability to detect, recognise, identify, remember – the ability to make

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qualitative judgements of odors such as intensity, hedonism, familiarity, edibility, etc. still remains. (Brand, 2019)

In recent years I have developed – alongside Francesca Ripamonti – an Olfactorium project, in Il Paese Ritrovato, a small village for Alzheimer's patients in Monza, where the inhabitants practice olfactory gymnastics to slow down the degeneration of the disease. This project stemmed from the scientific evidence that Alzheimer's patients gradually lose their sense of smell and consequently the cognitive relationship between smells and memory, but it wanted to test what the scientific literature of recent years has shown instead, namely that the loss of cognitive memory is not accompanied by an equal loss of emotional memory. (Albrecht, Schreder, Kleemann, Schöpf, Kopietz, Anzinger, Demmel, Linn, Kettenmann, Wiesmann, 2009)

Research carried out by the Alzheimer's Society shows that patients react to certain odors, such as cinnamon, with a significant increase in certain cognitive functions, such as visual-motor responses, working memory and the attention threshold. Olfactory stimulation, which can evoke pleasant memories in the elderly, induces greater sociability and a desire to get out of the house and establish relationships, leaving behind the isolation that is often the cause of depression. Some fragrances are capable of transporting people back in space and time, and therefore their inclusion in retirement homes, or homes for the elderly, can be of great help to their sociability. (Ansari, Johnson, 1975)

The Olfactorium was therefore an olfactory gymnasium to exercise patients' emotional memory and stimulate sociality and vitality.

In addition to the research interest in the health and care area, a significant part of the research was directed towards the commercial area, driven by marketing rather than interior design.

The emotional relationship between smell and emotional memory has been a privileged territory of experimentation in retail, hospitality, fashion, food, sports, cosmetics, entertainment, tourism and all the imagery that experience design is able to generate. (Spangenburg, Crowley, Henderson, 1996)

Early studies, carried out as early as the 1990s, looked at the psychological reaction of consumers in shops that featured fragrances. (Gulas, Bloch, 1990)

Every year, exorbitant sums are spent on incorporating eye-catching lighting, sound carpets, furnishings, and equipment in shops to create atmospheres to increase sales or make the experience memorable. (Bouzaabia, 2014)

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Generally, the research has focused on localised odors (Gulas, Bloch, 1990), or on scented objects for promotional purposes (Morrin, Ratneshwar, 2000) and only in isolated cases has it focused on olfactory studies of spaces by testing the behavior within certain simulated environments. (Spangenburg, Crowley, Henderson, 1996).

Designing for the sense of smell in spaces means dealing with ambient scent, i.e. air, breathing, temperature, humidity, materials, orientation, scent and not specifically with the smell emanating from a particular object. (Morrin, Ratneshwar, 2000) (Zemke, Shoemaker, 2007).

Experiments on ambient scent show that consumer evaluations are better when the environment is scented than when there is no scent and that a scented environment always has a positive effect on behavior and evaluations. (Baron, 1997), (Chebat, Michon, 2003)

Incorporating smells into retail outlets, shops, gyms, as well as linking smells to travel and experiences is a lucrative market. Those who design spas, cruise ships, large hotels know the persuasive and attractive power of olfaction within hospitality experiences. (Shoemaker, Lewis, 1999).

The olfactory brand also concerns the designer of spaces who must design and govern this experience, create real emotional landscapes that are memorable, without being toxic and invasive. (Bone, Jantranis, 1992)

Other studies show that a design of environmental stimuli that focuses on the coherence between smell and sound produces greater satisfaction with the experience and makes consumers' decision-making processes more efficient. (Mattila, Wirtz, 2001), (Mitchell, Kahn, Knasko, 1995)

Research testing the effects of environmental odors on brand evaluation and recall shows that odor consistency has a relationship with brand memory. The presence of odors in the brand evaluation phase results in participants' increased attention to brand stimuli, increased brand recall and increased accuracy in brand recognition. (Morrin, Ratneshwar, 2003)

Invisible Architectures

The book is structured around seven major thematic areas, which remain highly topical today because they act as a bridge between smells and places, objects, rituals involving death, the spiritual, bodies, sex, time, identity and authenticity, memory, emotions, rituals, etc. (Chu, Downes, 2002)

The theme of death deals with the inexorable transformations of matter, which, as it transforms, releases into the air the volatile components that we somehow inhale. These transformations, heading inevitably towards death, show a seamless continuum. The polyamines cadaverine

and putrescine, which are crystalline compounds found in decomposing organic matter, belong to the same family as the spermidine and spermine found in semen.

The subject of spirituality and the places associated with it also still finds in the sense of smell one of its most important mediums.

Although rituals are disappearing, the smells of incense and candles remain expedients to lend spirituality to more secular and profane rituals and, on the contrary, the use of scents serves to invent new rituals and other spaces of sacredness. (Han, 2021), (Turley, Milliman, 2000)

Smells are primarily concerned with the identities of places, the authentic and the artificial, to convey emotions and memories. The identity of places, people, animals, materials, is inscribed in smell and that is why it is so powerful and dangerous. The olfactory identity is so memorable that human beings, barring serious pathologies, find it difficult to erase it. In fact, olfactory memory is a more accurate and reliable long-term memory than conscious memory. Whereas visual memory loses more than 50 per cent of its intensity after three months, memories related to the olfactory sphere only lose 20 per cent of their intensity after one year. (Barwich, 2022)

In addition to companies that place an important part of the emotional brand memory in the olfactory experience of their spaces, museums too have in the last decade discovered the identity and narrative nature of odors applicable to exhibitions, installations or works of art. Apart from a few museums internally dedicated to fragrances, such as the Musée du Parfum in Paris (founded in 1983) and the Osmothèque in Versailles (founded in 1990), there is a great exploration of olfaction in art, exhibition and curatorship of important exhibitions. (Nieuwhof, 2014), (Levent, Pascual-Leone, 2014)

In recent years, I have designed several museums in China dedicated to the local liquor, called *baidu*. The first is located in Shaoyang, Xiangjiao Liquor Museum in Hunan, the second Tongwangyao Liquor Museum in Changsha, the third in the Heritage Village of Lidu, Jiangxi Province.

The liquor is produced by fermenting sorghum, which is a strong identity element of this popular drink throughout China. The olfactory identity was indispensable in defining the narrative, display, and experience within the 3 museums. Sorghum scraps were used to make some of the plasters, but special diffusers were also designed for the olfactory tasting of the different states of ageing of the same liquor.

Olfactory identity also means similarity or diversity, it implies proximity or distance, attraction or repulsion, it regulates that social distance

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that induces us to buy perfumes to increase the aura of seduction, attraction, or to refresh spaces so that they are more pleasant. (Baron, 1981)

Multiculturalism and discrimination

The issue of multiculturalism, of diversity between peoples, urgently present in today's political debates, also concerns the sense of smell and the proximities between bodies that often smell differently. (Allen, Havlicek, Roberts, 2015)

According to odor-obsessed writer George Orwell, bad smell was an insuperable barrier to the success of socialism. (Sutherland, 2016)

Smell discrimination is also undoubtedly inscribed in the experience of places and relationships. Everyone smells differently, depending on their diet, age, physical activity, health. (Brand, 2019)

The history of spaces and architecture is about the need for human beings to distance themselves from bad smells. (Hamblin, 2020)

It begins with the distinction between human and animal odors, removing the beasts from the houses and confining them to the stables, continuing with the concealment of bodily odors relegated to the bathroom, and continuing with the denial of the smell of food in the kitchen, strategically distant from the reception rooms like in19th century bourgeois homes. (Muchembled, 2020)

When hominids abandoned their quadrupedal gait in favor of an upright posture, they marked a revolutionary breakthrough in the perception of space through the sense of smell. The nose was no longer close from the ground. Humans stood upright.

Sigmund Freud described the disgust for excrement as the strongest push to move from the quadrupedal position of childhood to the bipedal position of adulthood. The beginning of the industrial age brought an end to the 'excretional age' of architecture, when spaces were cramped and promiscuous with the smells of earth and bodies, of beasts, of sex. (Freud, 1991), (Hamblin, 2020)

The birth of skyscrapers was paradigmatic in its attempt to elevate whiteness and cleanliness beyond hygienic qualities turning them into moral values. The regulation of odors became a means of social and moral control. During the 20th century, spaces were dried out and dehydrated, for fear of tuberculosis and diseases of all kinds. Light and air became rights for all, as the 10th CIAM (International Congress of Modern Architecture, 1953) proclaimed. (Colomina, 2019), (Hamblin, 2020)

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In the last twenty years, the topic has become an obsession in some countries such as Japan, where the design and production of deodorants, halitometers and other instruments that can ensure that one's smell will not bother others, is one of the most flourishing markets.

With the pandemic, sensitivity became neurotic, for the obsession was not exclusively against bad smells, but rather against an odorless virus.

Air as a vehicle of contagion takes us back through the centuries, reintroducing protective masks, greater distances between people, less crowded spaces, and more efficient and tightly controlled ventilation systems. (Nestor, 2020)

Although we can recognise more than 10,000 different smells, we are among the animals with the least developed sense of smell and have exercised it less and less over the centuries.

The sense of smell is also connected to materials, for the air we breathe contains VOCs (Volatile Organic Compounds) that are gradually released from most materials used in architecture and design. They are present in buildings, materials, furniture, wood panels, laminates, synthetic fabrics, carpets, upholstery, insulation, polyurethane foams, glues, lacquers, resins and interior cleaning agents. (Henshaw, McLean, Medway, Perkins, Warnby, 2018)

Materials, in turn, react with each other in a kind of composition that blends the intangible qualities of different materials into a single dynamic identity. (Zumthor, 2006)

In a multi-species and digital world, the loss of our sense of smell could lead to our extinction. This is why the pandemic has raised a fundamental question for human existence that digital technologies can help save.

The relationship between virtual, augmented, artificial technologies and the sense of smell is a big gamble. To date, odors have not yet been digitally conveyed, but it is predicted that by 2030 olfaction will play a key role in IoT systems and immersive experiences.

More than half of the world's population lives with little to none contact with nature due to continued urbanisation, which increases the need for natural experiences. Research data shows that 60 per cent of people hope that videos will soon be accompanied by smells as well as sounds, and more than 56 per cent of respondents to this research expect by 2030 to be smelling the smells of the films they are watching. What failed in the 1960s experiments with odoramas during film screenings could now be enabled by technologies. (Ischer, Baron, Mermoud, Cayeux, Porcherot, Sander, Delplanque, 2012)

Will phygital life be odorless or instead more stimulated? What will virtual spaces smell like? What air will there be in the extremely artificial

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spaces we will design and live in? What role will Artificial Intelligence play?

There already are some A.I. experiments aimed at recognizing certain chemicals that can alert, modify, and react according to stimuli, just as there are technologies that can monitor what happens in spaces, but also choose the quality of the air we breathe. And there are patents and research on wearable technologies to help enable materials and fabrics around us to react to odors. (Tillotson, 1991)

One of my projects for a residential tower in Xi'an, China in 2018, explored the possibility of customizing the olfactory landscape of each flat depending on the time of day, the tenant's mood and the need to relax or wake up. In this case, both the materials and a home automation system allowed for the management and control of the air and any fragrances.

In a digital world that encourages the separation of perception and emotion, where the present is often a time of images uploading to then be experienced elsewhere, continuing to use the sense of smell may serve to keep the body at the center of the experience of place and the exclusive seat of emotion.

Olfactive Design

The relationship between the sense of smell and many disciplines of design and architecture is nothing new. Odors are found in the materials that build architecture, in the rituals that are hosted, in people's activities, in the people themselves.

When these two buildings, the visible and the invisible, are coherent, they produce pleasure, narrative and comfort; when they are not, the generated effect is one of discomfort, disorientation, and even illness.

We inhale and exhale 25,000 times a day, we let pieces of the world into ourselves: this dimension of the project and the meanings it carries should not be overlooked.

Places have smells, cities have smells. Paul Valéry recounts those of Genoa's *sottoportici*, Alberto Savinio the amiable ones of Venice and a plethora of writers have written about those of Paris, its stinks and its smells. Artist Sissel Tolaas has reproduced the olfactory landscape of 52 cities since 1998. (Henshaw, McLean, Medway, Perkins, Warnby, 2018)

Joseph Rykwert used to say that when one of his students mentioned, for example, types of Greek architecture, he would ask them what the Greeks did in the building: what happened on the altar, for example, where cows, bulls and other animals were sacrificed.

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The great masters of architecture designed considering the olfactory matrix of their buildings: Richard Neutra, Alvar Aalto, Peter Zumthor, Herzog and De Meuron, Gigon and Guyer, Diller and Scofidio, Philippe Rahm, to name just a few.

Today, this immaterial and profound dimension must be designed, it can no longer be left only in the hands of the companies holding the keys to our emotions, subliminally ready to guide us only towards their own interests.

We are at the dawn of an important new design discipline, that of olfactory design, which not only takes us into a dimension yet to be partly explored, but which requires new skills, offers new professions and markets. A discipline that requires transversal and vertical skills capable of exploring an aesthetic beyond sight, an ethic beyond consumption, a sustainability of materials, a healthiness of indoor and outdoor air, a knowledge of the neurological and physiological impact of certain substances on our actions and emotional reactions. (Bonnaud, Fraigneau, 2021)

Olfactive Design explores issues related to spaces, products, services, behaviors, experiences, interfaces and air qualities. It is a discipline whose main objective is not merely the scenting of environments, but rather the understanding of the nature of the materials that are chosen to furnish an environment, the movement of air in spaces, as well as their temperature and moisture which are able to convey odors and volatile components.

It is a discipline made up of the merging of several competencies in design, energy, chemistry, mechanics, neuroscience, art, perfumery, history, anthropology, ethnography, marketing, behavioral psychology, etc.

Olfactive Design is about designing a dynamic olfactory composition that can redesign spaces. Designing with the sense of smell means in fact constructing invisible forms of architecture within the visible one. In space, as well as in time, for smells move naturally and artificially and change continuously. It is therefore not a question of choosing a fragrance diffuser, but of choosing the materials to be used in the project also for their olfactory qualities, deciding how to make the air which carries them move, where to put a window or an air vent. It is a question of deciding which odor should trigger the experience and when to start it, and then how it should change over the course of the experience of a place, where it should be saturated and where it should be eliminated to make way for other odors or the absence of them. Entering a place hence becomes the moment in which memory, emotions, and behavior are activated. The lobby, the reception, the waiting room are places where the presence of smell kickstarts the invisible adventure of emotions in space.

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Designing spaces with olfaction is like writing a musical score, with pauses, rhythms, volumes, notes. The trivialization proposed by the market to allow the olfactory experience, conveyed by candles, incense, flowers, diffusers, is emancipating itself towards an integrated design, which stems directly form the project itself and is not included at the end as an afterthought decoration. The shift from perfumery and decoration to design has turned this into an area of research and design in the contemporary world, far removed from cosmetics and environmental perfumery, integrated with digital technologies and sensitive to people's physiology.

Olfactive Design offers unlimited opportunities. A design practice that, despite being present all throughout human history, has only today become a cardinal discipline in the experience of places.

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Preface

Joseph Rykwert recounts that when a student illustrates, for instance, types of Greek architecture, after a while he will ask them what the Greeks used to do in the architecture they are describing. What would happen, for example, on the altar? There were cows, bulls; sacrifices were carried out by slaughtering animals. Hence there was blood and there was stench. Rykwert states that one never thinks about these things, about the smell of a place… yet that is an important part of the understanding one can have of a building.

This book stems from a series of questions that we authors have asked ourselves in different circumstances of our lives, when in touch with the world of odors, perfumes, aromas. Our different backgrounds led to wondering how to represent smell and its qualities within a visual culture and how to use it as a design tool in architecture.

Other matters extensively dealt with in the book include: why aren't odors – beyond fragrances, perfumes, candles, or incense – used as part of the designing process? Why is the realm of smell rarely investigated by those who do not belong to the world of perfumery or chemistry? What type of architecture constitutes olfactory constructions?

Questions such as these prompted the first steps of this research, which over the years has become an actual journey through the history and geography of places that have a significant relationship with odors, air, and olfactory perception.

Through this analysis, it became clear that many were the places to experience when following the invisible traces of smell, cardinal the questions to be investigated, and unexpected the connections between the realm of smell and some of architecture's biggest issues.

Not only did we take into account the range of fragrances and aromas but also deliberately made a broader exploration that ranges from stenches

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to the more sublime scents, from the conscious use of air as resource, to its very use as a time machine, we took into consideration physiological characteristics at least as much as organoleptic qualities.

The result is a collection of thoughts, notes on the incredible intertwining of some places and some smells which helped us bring closer to us otherwise incomprehensible matters, opening still exploitable threads. The places here indicated are only some possible routes which may help shine a light on how much more there still is to be explored.

During this research we realized that between perfumers and architects – despite apparent distances – lie compelling connections, shared language, and comparable matters, so much so that we decided to bring them together, let them converse, invite them to an often-convivial debate on various topics. None declined the invitation, which felt like an encouragement to pursue the work.

Chosen meeting spots were never fortuitous: Paris' catacombs; the Zaansdrake windmills in The Netherlands; New York's Meatpacking district; Florence's Giardino dei Semplici; Hermès' leatherworking atelier in Paris.

In addition to specialists, we also met people who, despite working in other fields, find themselves investigating olfactory matters like us. Some of their reflections, contributions and provocations are present in the book as a compass for orientation and insight into specific topics.

Taking an interest in the world of odors, in a somewhat heretical way, not going through the rigorous disciplines of perfumery schools or nose training, has granted us the freedom to investigate and weave together topics and people that would have otherwise remained in their own specific fields of research.

While this work may be taken for granted by those more experienced on the matter, we hope that it will on the other hand arouse the curiosity of those less familiar with matters of the nose to whom this book is addressed.

It has been a beautiful journey that has left us feeling that we were moving, like pioneers, within regions which are still to be explored, examined, discovered, inhabited. It could have gone on forever, but like all real and not legendary journeys, there is a moment of arrival, of restitution, of sharing, which this book seeks to sum up.

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Introduction

The title, *Invisible Architectures. The experience of places through smells*, is meant to remind us that olfactory structures are often invisible, despite being poignant and present in one's experience of place. The title is also a reference to an exhibition by Philippe Rahm and Jean-Gilles Décosterd entitled *Architecture invisible*, which would perfectly title many of the topics here explored.

Western culture has historically been focused more on sight than on the other senses and reluctantly considers other dimensions that are nevertheless fundamental to the experience of architecture, design and living. Olfaction seems to be mostly extraneous to one's formulation of spaces, yet from a careful reading of cognitive and perceptive, cultural and social, design and anthropological phenomena, it would seem that smells not only are profoundly present in places, but sometimes even become essential ingredients in their very definition.

In 1949 Richard Neutra wrote that we should devote as much attention as possible to all of environment's nonvisual aspects. He perhaps foresaw the design limitation of those who did not also take the other senses into account. It is surprising for Neutra's statement dates back to unsuspected times, when the dictates of Modernism had reached their most mature stages and the visual dimension was far from the crisis that would later seize it. Yet Neutra, grappling with architectures at the edge of the desert, could not limit himself to formal functionalism while the fine, prickly soil filled his eyes and nostrils.

Countless are the reasons behind the lack of consideration of smell in architecture, some of which this book attempts to investigate within their contexts and reasons.

An apparent problem concerns the very invisible nature of the olfactory experience, for that makes it hardly manageable through the usual

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vision-based tools of design. The invisible, to be considered, often had to alternate media, formulate new expressive languages, become clear and evident, make itself visible to avoid oblivion.

Another reason is to be found within the intimate relationship that's established between emotions and the sense of smell, that profound perceptive sphere capable of arousing primary passions that are sometimes ungovernable not only by designers, but by mankind in a broad sense.

The evocative potential of smell derives from its emotional power for odor is vehicle for memory and as such digs deep into memory, bringing back pleasures or pains impossible to stir away from in accordance with the emotional layers it evoked.

Moreover, smell is an extremely unstable and elusive sense which, like sound and natural light, grapples with the dynamic flow of time on things. This evanescence quality makes it ungovernable for Western design culture that sinks its roots in Greek culture, which placed sight, hearing, and touch at the center; on the contrary, precisely because of its intangibility and transcendence, smell is right at the basis of Eastern culture.

If one wishes to retrace a possible history of odors in architecture one must almost immediately recognize not only the cultural differences between East and West, but also those between North and South, between the various regions of the world, between xeric and swampy land, between tropical climates and arid areas, between alpine huts and underground lairs, between local specificity and global homogeneity.

The relationship that is established between space and scent is therefore itself the complex result of various odors: those of the materials that constitute the space, of the furniture inside it, of the actions that take place in it according to the time of the day, the orientation, the humidity of the air, the persistence, the degree of saturation, the temporality and even the quality… in short, of a whole plethora of coordinates that are impossible, or at least very difficult, to manage.

Nevertheless, if one wishes to address the issue of odors in architecture, one cannot refrain from the questions that Tala Klinck poses in the book *Immaterial/Ultramaterial* edited by Toshiko Mori. She asks, for instance, what are the smells of the polished marble, the urethane-coated wood, and the hot laminated steel in Alvaro Siza's buildings. She wonders how the resins, the solvents, and the pigments contained in latex paints, drywall, nylon carpets, or epoxy carpet glues influence our perception of spaces She states that Rudolph e-Khoury believes that the modern surface is the extension of a visual logic of cleanliness and that the universal appeal of the white wall in modern architecture derives from its capacity

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to translate the absence of smell into an image. Klinck sees all of this as an epochal turning point.

And this is perhaps the strongest feeling that the research work carried out for the writing of this book leaves us with, that of feeling that we are in the presence of an 'epochal turning point' in the evolution of olfactory studies, further confirmed in by the 2004 Nobel Prize in Medicine to Richard Axel and Linda Buck for having clarified the mechanisms that control the way odors are perceived, from the molecular to the cellular level, and by the feeling that this invisible dimension of architecture is becoming more and more immanent, more and more a subject of study, research, artistic and architectural design, like never before.

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1. Death/Entropy

The Last Breath

The relationship of the physical and metaphysical body with death and entropy is one of the fundamental keys to understanding the relationship that smell establishes with the here and now, with earthly life and the things of the world.

Death is an experience strongly connected to odors, those of the physical body separating from the spiritual: the former decomposing and returning to the earth, the latter volatizing, exhaling a 'last breath' which conveys the departure from matter and the passage of state.

Death has always been connected to perfumed or mephitic exhalations, depending on the conditions, contexts and even biographies of the deceased. Consequently, the rituals and places related to a death have from the very beginning been odorous, imbued with an olfactory dimension that worked as a proper account of said passing.

During great epidemics, wars, and dramatic genocides, actual olfactory territories would unite all in the same fatal breath.

We will have to get to the 20th century and to death no longer perceived as a collective event, but as a private, solitary one in a hospital, for the smell of the dead body to become clinical, disinfected, frozen in its processes of decomposition, and to acquire an olfactory distance from the mortal event, as Michel Foucault wrote.

Death was believed to concern the exhalation of the body's air since the Egyptians. It has always been a custom to plug nose and mouth of the deceased or of those visiting a dying person, even more so in times of great epidemics and contagions, visitors of a sick or dying person would wear a kind of beak filled with essences, to emphasize how the dying person's breaths could in and of themselves convey death. Smell was thus

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considered to be the cause rather than the effect of death itself: a volatile and invisible death, more lethal because it was everywhere, inhaled through the nose with breathing, with no way of escaping it.

Separating the home of the dead from that of the living

Separating the smell of the dead from that of the living is cardinal in burial rituals: embalming, burial, cremation. All are performed with the same methods and techniques as the processes of preparing ingredients and extracting essences for perfumes: drying, enfleurage, distillation.

The embalming rituals of the Egyptians, aimed at connecting one with the eternal present, consisted of emptying the body of earthly humors in order to stuff it with fragrances, divine balms such as myrrh, and resins such as storax.

In the 'house of purification', the embalming process took place, beginning with the extraction of the brain from the nose and then of the entrails. The body was not emptied completely, heart and kidneys remained inside. Once the body had been emptied, the embalmer would salt it by immersing it in a kind of brine, *patron*, in which it would soak for about thirty-five days. The body was dyed with henna taking on a red color for men and a yellow one for women and was then filled with pads soaked in resins and ointments. The storax was rubbed all over the body and then poured into the skull through the nostrils. Bandages were also dipped in storax and then smeared with spices. Then it was time to wrap it in layers using linen bandages and other fabrics.

The mummy was eventually placed inside a sarcophagus, which was to be considered the 'house of the deceased', and as such followed the architectural styles of the various eras, with the lid as a 'palace façade'.

The Egyptians were incredible architects and refined perfumers, and perhaps for this reason it is not difficult for us to read the sarcophaguses, and even the pyramids, as gigantic *ante litteram* perfume boxes.

The nose of architecture

The pyramid is the standard shape used to imagine the structure of a perfume and its overlapping with the human body is as evident today as it was in Ancient Egypt. The olfactory pyramid is divided into three parts: head, heart, tail, just like: top, center and base. The pyramid shape was chosen because when one smells a perfume, the head-top notes, at the

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apex of the pyramid, are the first to be smelled and, being the most volatile, are also the first to disappear (citrus, fruity, spicy). The heart-central notes (floral) emerge subsequently, followed by the tale-base notes (woody, musky, ambery) which are the ones that stay.

The Temple of Luxor is considered a key to understanding the origins of Western alchemical tradition. The afterlife was an 'eternal present', not simply a moment connecting past with future, but a permanent projection less condition.

George H. Dodd and Steve Van Toller wrote, in relation to R.A. Scwhaller's twelve-year long studies on the hieroglyphics in the Luxor Temple, that in the eternal present time does not flow, one is eternally still in the moment when the divinities and the spirits performed their mythical deeds coming directly into contact with human beings.

The Egyptians knew the inner anatomical conformation of the cranium. The nose was called *fnde*, and the cranium *shtyy nt fnd*, or "hall of the nose", "sanctuary of the nose". According to Dodd and Van Toller, the fact that the Egyptians believed that the nose was a sort of sanctuary gives us insights into the corresponding sanctuary in the Temple of Luxor. Schwaller studied the anatomical structure of the nose and saw that if one were to place the longitudinal section of the cranium over the plan of the temple, the olfactory senses would correspond to room V, while the olfactory bulb and the frontal cerebral lobes to room XII. The wall separating these two rooms corresponded to the cribriform plate of the ethmoid bone, through which the olfactory nerves reach the olfactory bulb. Schwaller concluded that Room V, the sanctuary of smell, was where the sacred ceremony of the anointing of the pharaoh with scented oils was carried out. He also noted that on the eastern wall of room V, which corresponded anatomically to the area of the forehead where the olfactory bulb is located, the list of the oils and scents to be applied on the pharaoh's forehead had been engraved twice. The pharaoh's crown is depicted precisely in correspondence to the zone of the cranium, and it is surmounted by a rearing cobra, symbol of the sense of smell and capacity for judgment. If Schwaller's theory were correct, the Temple of Luxor would then be an architectural representation of the olfactory system.

The Architecture of the Nose

The nose is central. It protrudes into space from the center of the face and connects all other facial orifices. The nose's forward protrusion is counterbalanced by the skull's backward protrusion at the occipital lobe.

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On the average or idealized face, the vertical position of the tip of the nose and the width of the nostrils are in proportion to the line of the eyebrows, to the line of the mouth and the vertical and horizontal dimensions of the entire face, from chin to hairline and across the cheekbones. The nasal chamber's vaulted ceiling is supported by the septum, a vertical wall that divides the chamber in half. The septum is the nose's central axis, arching with an almost imperceptible transition from its bone foundation to the cartilage cap. Internally this bell-shaped cap shows two rising symmetrical spirals which resemble the hydrodynamic, swirling shape of liquid jets.

The ethmoid bone, the nose's bridge, is a crux of the face. According to Alberto Giacometti, who spent decades painting and sculpting perfect heads, the junction of the nose's bridge and the eyebrow was the key to the face; he felt that if he managed to capture that bit of anatomy then the rest of the head would automatically fall into place.

Nostrils, the nose's entryway, are, like eyes and ears, in a symmetrical pair for depth perception. Studies on brain imaging have shown nostril-specific localization of odors. Although they work in stereo for spatial perception, there is always one nostril that is more active than the other. In two hour cycles the activity moves from one side to the other. The nostril's hairy surface acts as a filter, clearing it from dust or insects.

Ascending the nasal cavity are the turbinates. Spirals which repeat themselves in the nose's shape, specifically in a triplicate turbinates' shell-like shape, *conchas*. The spiral twits the air currents into vortexes, rolling them into a maximum amount of contact with the cleansing mucus membrane that covers all the internal nasal surfaces. Likewise, other airborne olfactory components also mover, optimizing their contact with sensory receptors. Mucus, a watery, protein and carbohydrate-full substance, captures dust and evacuates it with a constant ciliary flow towards the pharynx. The moisture of mucus also facilitates the transmission of electrochemical olfactory *stimuli*. While a turbine generates energy, the turbinates generate mucus. They fluctuate between contraction and swelling, dryness and moisture to attune the air and purify it before it enters the body. This self-regulation is taken care of by the autonomic system, responsible for other body systems such as digestion, blood pressure and heart rate.

The paranasal sinuses are four pairs of chambers flanking the nose. The mucus, a cleansing and saline liquid, runs through them, circulating thanks to cilia, tiny fluttering hair-like structures. About half a liter of this fluid flows through the sinuses daily in the body's effort to decontaminate incoming air. Mucus runs down the back of the pharynx and into the stomach where it is purified. Once the incoming air has been cleansed and

acclimatized, it proceeds downwards into the many branches of the lungs, shaped like upside-down trees.

The nasal cavity and the oral cavity are like a duplex, separated by the upper part of the mouth's palate. Because of this proximity, some of the features normally considered solely related to the mouth, such as taste and speech, derive from this duplex configuration: a major part of flavor perception is an olfactory signal; and the sound of one's voice is shaped by the resonance of the nasal cavity's vaulted ceiling.

The nose is really an antechamber, a loading dock for air and odor. Air is inhaled downwards, and olfactory signals rise upwards. Olfactory nerves send electrochemical messages to the olfactory bulb in the primitive part of the brain. The messages that enter the brain are connected to a series of systems. The limbic system – our emotional center – memory, and sense of direction are all directly influenced by olfactory information.

According to Eastern notions of bodily mechanics, the energy which charges the air – *chi* in China or *prana* in India – stems from the olfactory bulb. Both cultures have developed refined breathing techniques with the intent of harnessing this circulating energy. Yogic breathing involves the introduction of air in one nostril and its exhaling through the other to affect different parts of the nervous system. Inhaling transmits external olfactory information to the brain, while exhaling transmits internal information for molecules coming from the lungs flow through nasal scent receptors on their way out. This internal information allows the body to trigger a bio-feedback loop which regulates itself also in accordance with signals coming from the lungs.

Alchemy and Pharmacy

Precisely because close to the territories of death, the realm of odors has mainly been explored by magic and religion, by alchemists and monks, who developed medicine and pharmacy during the Middle Ages to treat both body and soul with the same potions.

Those outside of these two masterships who manifested some sort of interest in the world of odors were looked at suspiciously and even, during humanity's darker times condemned to burn at the stake like it happened with witches.

It is no accident that one of the world's most celebrated producers of scents in 1221 was the Officina Farmaceutica di Santa Maria Novella, established in Florence by Dominican friars who cultivated medicinal herbs to treat the sick and the dying. The history of this institution is

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emblematic to trace the history of smell in the West. Initially private and monastic, it opened to the public around the Seventeenth century and expanded its trades all the way to China, Russia and India in the following hundred years converging along the same route redemptive and commercial interests alike. The Officina went from being a religious institution to a laic one, despite still maintaining that mystical and solemn aura typical of monasteries.

The basic tool used by alchemists and doctors was one and the same, the alembic. The uncertain genealogy of the word – *al-Ambik* has a dual Greek and Arab etymology – made its entry into the West, to carry out the first distillations, less "suspect". It worked by means of a recipient into which the ingredient was placed and heated. Its vapors would then condense and cool down producing a liquid known as "essence". Nowadays the process is much less "alchemical" because of tools such as the headspace, which can measure odors in a place without necessarily needing to extract them using traditional processes. It's a glass dome-shaped device under which the analyzed object or area is enclosed. Through a process of vacuum-sealing the area is isolated and its molecular composition analyzed to recreate its olfactory identity. This process cannot be carried out in all instances, yet it remains one of the main ambitions of anyone who steps into the world of odors. Grenouille, the protagonist of Patrick Süskind's Perfume, «sought to distill odors that most people do not even perceive such as that of glass, the fresh, clay-like odor of smooth glass. He was completely unsuccessful. He thought he could extract the characteristic essence of things using his alembic, as could be done with thyme, lavender, or cumin. He also tried to distill brass, porcelain, leather, grains, and cobbles. He distilled pure earth, blood, wood, and fresh peaches. He distilled his own hair. Finally, he even distilled water, the water of the Seine, whose particular odor he felt was worth preserving».

Putrescine and Cadaverine

The smell of death is certainly the most tangible perception of entropy, of the inexorable and irreversible loss of energy a decomposing body exhales in the form of gas. However, in the interplay between the rhythms of life and those of death, perhaps the most interesting information is given to us by molecules of putrescine ($C_4H_{12}N_2$) and cadaverine ($C_5H_{14}N_2$). These molecules are responsible for the smell of rotting flesh that accompanies the decomposition of organic matter. What is interesting is that the same molecules are the ones that produce the smell

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of semen: therefore, in olfactory terms, death and conception are very closely linked, in a continuum.

Perhaps instinctively this vital continuity in the death-putrefaction-rebirth cycle was felt in rural cultures where the smell of manure was not cursed, but rather welcomed, perceived positively as fertilizer: benefits and drawbacks would balance each other out. With the emergence of the industrial city, the various production, transformation, and consumption processes were inexorably separated. The natural cycle was forced by the driving rhythms of the machines. Processes of assimilation became inevitably congested and the first landfills were created.

The industrial era hence caused a serious case of indigestion for the cities, imposing the need to manage debris, contain stenches, send manure away, and hide excretions away from houses, *piazzas*, and streets. The underlying continuity that had made the natural smell of death "tolerable" was finally broken to make way for one of the most frequent conceptions of urban utopia: the scented city.

Dosages and Concentrations

One's relationship to odor depends on one's judgment (taste, quality, memory), on the duration of the act (repeated stimuli lead to inurement) and the smell's concentration (smells which we might recoil from at high concentrations may produce a pleasant perfume at low concentrations). This is all well known in perfumeries, where extracts of excrements, hormonal secretions, or excited animal's calculi are all used in low concentrations as indispensable ingredients of the compositions.

Hence no stinks or odors exist per se outside created combinations and in relative concentrations. However, any investigation into what might be considered the "stench among all stenches" results in the same answer: excrement. Within the arms trade, the Pentagon carried out a study to determine what the absolute stink was something which would make one escape and trigger utter disgust in any given culture. After years of experimentation with some of the most horrendous stenches in the world, the unrivaled winner was the "standard bathroom malodor". Before even being recognized, this smell makes anyone who's subjected to it immediately run away. It is a concentration of smells from various types of excrements which is generally used to test the effectiveness of deodorants. However, its applications are rapidly expanding outside the world of environmental hygiene and into the realm of "social hygiene" as possible crowd dispersers to replace tear gas as a means of controlling demonstrations.

Scatology

Roland Barthes stated that does not stink, suggesting that outside the semantic experience, the smell of feces is among the most nauseating of the olfactory experience.

The moment in which early hominids gave up their quadruped gait in favor of a vertical stance marked a revolutionary turning point in the perception of geometrical and olfactory space. The nose was now farther away from the level of the ground hence from the section of the space with the highest concentration of smells. This new-found distance led to a loss of familiarity and a change in taste regarding certain odors that were previously considered pleasant but had now become repugnant. On the scale of the individual and not of the species, this idea is echoed in Sigmund Freud's theories – he ascribed most neuroses and psychoses to the emergence of one's disgust towards feces, an unnatural coercion that leads the child to perceive feces as extraneous to themselves and thus disgusting.

If we drew a parallel between the individual and the city we may think that similarly to how in the growth of a body (whether human or urban) there always is a moment of rising up from the ground, of going from a horizontal to a vertical position, of gaining distance from one's excrement and from the ground level, likewise the first industrial city produced the skyscraper as a new way of rising from the ground and gaining space above. This was not only as a response to high population density, but also a means of escaping from the miasmas of the street, the stenches of the ground. It is no coincidence that Rome, the ancient city *par excellence*, has bequeathed a symbol of its power in the form of the hydraulic engineering work of the Cloaca Maxima.

We may then consider architecture's "excremental age" to be one of promiscuity with the odors of the ground, with bodies, beasts, sex and feces, which were also regarded as resources in pharmacy and cosmetics. The advent of the industrial age marked the end of this world. It removed odors of bodies and animals from the city and its architecture. It elevated whiteness and cleanliness to moral values as well as hygienic ones. It ventilated spaces and exposed them to the light of day like never before.

The works of early hygienists moved in this direction of excrement isolation. The latrine-towers that seemed inspired as much by chimneys as by D'Arcet's dovecote were public toilets comprising a seat suspended almost in thin air accessed via a metal walkway. Significant progress in construction materials and finishes was made with the advent of smooth surfaces, enamel and lacquer which could ensure that air and water run off unhindered.

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In the East, however, another direction was taken. The idea of toilet which Junichiro Tanizaki describes in his most renowned work In Praise of Shadows is one of a place of spiritual rest: «The parlor may have its charms, but the Japanese toilet is a place of spiritual repose. It always stands apart from the main building, at the end of a corridor, in a grove fragrant with leaves and moss. No words can describe that sensation as one sits in the dim light, basking in the faint glow reflected from the shoji, lost in mediation or gazing out at the garden… Here, I suspect, is where haiku poets over the ages have come by a great many of their ideas. Indeed, one could with some justice claim that of all the elements of Japanese architecture, the toilet is the most aesthetic». According to Tanizaki, the hardness, the shine of the tile isn't just an aesthetic and sensorial offense, it's also a religious and philosophical one.

Futurism and Necrophilia

In matters of cleanliness, hygiene, air and light the Futurists were true militant fundamentalists. The exaltation of upward and diurnal values in opposition to the symbols of night, was not only a manifestation of progress and energy, but also a maniacal way of exorcizing death.

According to Eric Fromm excessive hygiene is one of necrophilia's traits alongside passion for foul smells. In this sense one of the Manifesto published by Tommaso Filippo Marinetti in 1910 outlining Futurism's main guidelines, could be read as an authentic attack against the humors and odors of the body and architecture rather than a proclamation of innovation. «We aspire to the creation of a non-human type from whom moral pain, goodness, affection, and love will be extirpated, mere poisons eating away at our inexhaustible vital energy, no more than on/off switches to our powerful physiological electricity. In order to overcome the biological human we, on the other hand, enlist scientific knowledge, especially mechanics, that will give rise to the creation of a new being, the 'non-human type'. This non-human, mechanical type, built for omnipresent speed, will naturally be cruel, omniscient, and combative. The realm of life has become the realm of 'non-life'; people have become 'non-people'. [It is] a world of death. Death is no longer represented by stinking feces and corpses. Now its symbols are clean, gleaming machines; men are no longer attracted to fetid latrines, but to structures in glass and aluminum».

The biology of matter had become an obsession to be exorcized with exercises in creativity and design in all fields, especially those where there still were traces of uncontrolled naturalness. This is clearly exemplified

in *Futurist Flora and Plastic Equivalents of Artificial Odors* by air-poet Fedele Azari, dedicated to the death of odors and natural flowers and their replacement with others designed and created in the laboratory.

But the first signs of this fear merging death and excrement together are found in late Nineteenth century literature in a pivotal piece of writing on the sense of smell, *Au Rebours* by Joris Karl Huysmans, which strongly challenged once more the olfactory dogma by which natural odors were better than artificial ones. The protagonist, *Des Esseintes*, collects flowers that look artificial rejecting natural ones, and goes to live *au rebours* (against the tide) in a countryside pervaded by industrial odors, signs of that modernity which favored the artificial as an emblem of progress, perfection, control, and reproducibility.

In support of Fromm's thesis, architect Bernard Tschumi stated in an interview that the completely white structures of the 1930s represented, on the one hand, society's fears of death and decomposition, and on the other, admiration for the white and desiccated ruins of antiquity. Tschumi hoped that the hypocritical distinction between mind and experience of space in architecture could be overcome, saying that emancipation from taboos such as decomposition and eroticism were among the most interesting ways of transcending this paradigm.

Blood

Death's violent smell is that of blood. This is the olfactory experience which most strongly alerts and excites, terrifies, and reawakens the animal that is in all of us. The smell of blood is that of aggression, of the violent proximity of death, of primal hand to hand combat.

In the book *The Conquest of Mexico*, Cortés described the unbreathable smell of Aztec cities. Upon arriving in Tenochtitlan – one of the main cities, with spacious *plazas*, temples, buildings, and luxurious gardens – the bloodthirsty Spanish soldiers immediately felt that the air was saturated with human blood. At night, as a matter of fact, ministers would perform blood rituals with animals and people. Because of these ceremonies Aztec cities developed the standard city center that we are all familiar with broad *plazas* for public gatherings, religious dances and games were built. These spaces were meant to host all those who were left outside of the pyramid-temples where the sacrificial rites were being carried out. A broad staircase led to the top, from which the ministers would precipitate the lacerated bodies of the victims– ritually executed, four at a time, from dawn to dusk, four days a week.

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Blood was everywhere, not only near the sites of the sacrifices, but also used as mortar to knead construction material for buildings and monuments. Cortés wrote that the statues of the Aztec gods in which they believed were much taller than a big man. They were made using the seeds and legumes the Aztecs also ate. They would grind them and mix them up with human blood from hearts ripped from the chests of living people. They would knead the grinded flour with the dripping blood until the mixture was enough to build a huge statue. And after the statue had been built, they would sacrifice other human hearts to them.

Many are the places associated with the bloody smell of death: battlefields, sacrificial altars, arenas, and slaughterhouses. If we were to awaken our olfactory imagination to feel the smell of blood which impregnated the Roman Coliseum when the lions tore the bodies of the early Christians apart, we might grasp the overwhelming feeling of excitement, participation, rite, and madness that stemmed from that place. It is the same sensation we might feel today in a *plaza de toros* when the bull, or perhaps the *torero*, is killed in the *corrida*. And perhaps it is the same feeling we might find in other places of collective excitement in which sooner or later blood begins to flow.

The blood of death and pain has disappeared from our lives. We have frozen it hot, odorous, sticky, and thick in our freezers, free of smells or feelings of guilt. We have absorbed it into deodorized tampons humorless bodiless. We only keep a visual record of blood. We embrace it in films à la Quentin Tarantino, or in its emphasis in films like *Saving Private Ryan* by Steven Spielberg where the landing sequence is a gruesome explosion of bodies, blood, and human pulp mixed with the fine sand of Normandy almost fully penetrating the nostrils of the audience as a memento.

That is why body art shakes us when it embraces blood as a fundamental ingredient in its performances. That is why any of the works of Franko B's – where the flagellated body dripping with blood becomes a canvas, not for beauty or perfection, but for the pain, the love, the hate, the loss, the power, and the angst of the human condition – hits us in the guts and consciences.

Punishment

The electric chair is a theater of cruelty whose smells are perhaps the most extreme recollection of this exercise of death. And yet when it was first introduced in the United States in 1888 its practice was thought of as a more "humane" alternative to hanging. And it is perhaps for this ambi-

tion of normalcy that Andy Warhol adopted it as an icon of his times, as a common image to be silk-screened in all its banal violence in 1967's *Big Electric Chair.*

It is a strange short-circuit that of the inmate strapped to the chair with moist copper electrodes fixed to their head and legs. The other end of the wires is connected to an electrical generator that within short intervals emits strong electric shocks which range between 500 and 2.000 Volts. The procedure causes visible devastating effects. The prisoner sometimes leaps forward held by the straps. They may urinate, defecate, or vomit blood. The internal organs are scorched. The air fills with the smell of burnt flesh. It's no more than ten minutes, those drowned in the tears of the audience while they look at the shocks running through Selma's body – played by the unmatched Icelandic artist Bjork – in Lars Von Trier's Dancer in the Dark (1998).

Another method, 'inspired' using poison gasses in World War I, was introduced in the United States in the 1920s. Here the prisoner is sealed into a watertight gas chamber. Within eight-or ten-minutes hydrogen cyanide gas is released in the chamber inhibiting the action of respiratory enzymes which transfer oxygen from the blood to the body cells. The prisoner usually holds their breath in the first few minutes but is then forced to inhale and quickly dies of asphyxia.

Food

Places dedicated to food and its transformation are of very high entropy levels. There, matter is transformed into something else by dissipating energy and emanating strongly perceptible odors.

The smell of food is an indicator of its quality and state of conservation, or, we might say, its relation to the processes of decomposition. In the process of food transformation bacteria are the great architects, actants of decomposition. Bacteria are in some ways fundamental ingredients in the alchemy of odors: if there are few of them they may lead to unusual stagnation processes; if there are too many of them they may decompose the food to such an extent they make it rot. Many important food conservation processes such as seasoning, fermentation, leavening, etc., would not exist without bacteria.

In order to overcome the decomposition of food, as well as to cover up the taste of food gone bad, spices were imported from the East, finding their most perverse applications during the Baroque period. Baroque cuisine, usually based on game, heavily tasted of dressed corpses, embalmed in

honey, flavorings, spices, and balsamic vinegar. Baroque cuisine was not a happy exercise, but rather an almost macabre ritual of death (the animal) carried out by the living (the person). Still life paintings come to mind, especially those by Caravaggio, with their pale and emaciated fruit that looked like it emanated that sickly-sweet smell of rotting fruit.

There are designers and artists who are not averse to odors and the stench of decomposing organic matter and use stink as an ingredient in their projects. One example is Gaetano Pesce, who displays perishable works in his exhibitions. Among the better-known ones are the olfactory experiences at the *Made in Italy* exhibition, where he displayed typical foods and drinks that would change over time, providing the visitor with an unusual and unforgettable olfactory experience.

The food flavoring industry represents one of the most flourishing industries and one of the ones we should look at more suspiciously in the coming decades. As prophesized by Philip K. Dick in *Ubik*: «Tired of lazy taste buds? Has boiled cabbage taken over your world of food? That same old, stale, flat, Monday-morning odor no matter how many dimes you put into your stove? Ubik changes all that (…) One invisible puff-puff whisk of economically priced Ubik banishes compulsive obsessive fears that the entire world is turning into clotted milk, worn-out tape recorders and obsolete iron-cage elevators, plus other, further, as-yet-unglimpsed manifestations of decay».

Eau de New Orleans

When Noah opened the window of his Ark to see if it had stopped raining, he must have smelled something which might as well have been the world's olfactory essence, the absolute fragrance. In that water, on which his Ark was floating, lay all of creation: people, animals, plants, all that had been submerged. Who knows how long it took for all that water to recede, for the mud to become solid ground, and for that primordial odor to be taken away from the nostrils of the survivors.

The experience of death through the smell of stagnant water is strong, as if that hypo-oxygenated solution teeming with bacteria were the airborne expression of the end. Again, in Süskind's *Perfume*, Paris is a city filled with mortal humors: «The thousands of odors and stenches oozed out as if from thousands of festering boils. Not a breeze stirred. The vegetables in the market stalls shriveled up. Meat and fish rotted. Tainted air hung in the narrow streets. Even the river seemed to have stopped flowing, to have stagnated. It stank».

The image of submerging water brings to mind the *tsunami* that hit the coasts of Thailand and Indonesia, moved the island of Sumatra, drowned thousands of people, homes and buildings, and a vast region of Southeast Asia back in 2003. It brings to mind Hurricane Katerina that hit New Orleans in 2005, killing people, destroying buildings and roads. It makes one perceive the endless cycle of the ecosystem.

A project by 2A+P titled *Swamp Project for the Ecocenter at the Nakdong River* was developed with the intention of creating a structure that rests on, and then sinks into, the soil due to its scarce resistance. The center part of the project, foundation-less, is dug at the same level as the river, in direct continuity with the natural soil. A thick reedbed consolidates the structure and supports the roof and allows the system to breath providing air circulation with its cavities, triggering a process of self-ventilation supplemented with fans.

A foundation-less ring-shaped structure floats reacting to the thrust of the sandy soil. The sand dune mutates into a habitable swamp, a hypogeous environment that stores a microclimate in its depths. A habitable greenhouse in direct correlation with the natural environment into which the visitor is immersed down to the water level. It is an experience submerged in exhibition space, an exploration in the depths of the soil. *Swamp* is an invisible architecture lacking any formal value, an organic system, operating laboratory to study the ecological and environmental conditions of the Nakdong River area.

Volatile Organic Compounds

The olfactory pollution of contemporary cities is caused by three fundamental factors: difficulty in disposing of waste; air pollution caused by car exhaust; lack of both adequate public policies regarding odors and of management of air scenting operations.

The air we breathe contains Volatile Organic Compounds (VOC) which are actual killers. We perceive them as a pungent sensation as they excite the trigeminal nerve, which has the fundamental olfactory role of alerting us to danger. VOCs are organic molecules, hence containing carbon, that we perceive only at relatively high concentrations but which are slowly released over time by most of the materials we employ in architecture and design They can be found in construction materials, furnishing (fabricated wooden panels, particle board, paper, synthetic fabric, carpets, plastic coatings, insulation, polyurethane foams, glues, lacquers, resins, moth repellents, wood preservatives, etc.), and detergents for cleaning inte-

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riors. They are also released during combustion processes such as using kerosene heaters, gas stoves, or smoking.

Other factors that affect air quality are the electrostatic properties of certain products such as carpets and some synthetic wallpapers, and the hygroscopic ones of certain materials that absorb odors like sponges.

Some of Emilio Ambasz's underground works turned out to contain such high concentrations of radon gas released due to the presence of soil in the work, that a serious drawback which required control measures in subsequent works was called for.

However, a careful analysis of the volatility of dust may contribute to the olfactory and visual qualities of certain spaces. In Annette Gigon and Mike Guyer's early works for the restoration and expansion of the Oskar Reinhart Collection they mixed limestone from the Jura with copper into the concrete. This made for surfaces which would rapidly turn from red to green. While in Zurich's Switching Box iron oxide pigments were implemented in the small building. These pigments hold the same chemical composition and smell of the dust produced by trains on rail tracks.

Dust and infra-thin

Dust carries the odor time and of the material that produced it.

In his book *La polvere nell'arte* [Dust in Art], art critic Elio Grazioli traces dust's evolution throughout art history where it is initially perceived as a negative manifestation, formless matter, entropic materialization of the passing of time. But then, starting with Marcel Duchamp's Dust Breeding it turns into an expressive and positive ingredient in art – from that moment onwards, writes Grazioli, "dust is a trace", and thus an inscription and a narrative.

Another pivotal book in understanding the relation between dust and our times is Marco Belpoliti's *Crolli* [Collapses], which focuses on the timeframe between the collapse of two pieces of architecture – the Berlin Wall and the World Trade Center – to weave together an account of the art at the end of the millennium. Belpoliti recalls the incredible circumstances which led to the creation of Wolfgang Staehle's 2001 work *Untitled*. The artist was in New York with an installation that involved setting up a number of video cameras in various parts of the world – one of these cameras was filming the Twin Towers on the morning of September 11. It was an unintentional live coverage. He caught everything. Even the dust rising thick over Manhattan and invading its streets, buildings, and apartments, surrounding those fleeing the scene of the disaster, cars, benches, parks, and trees;

thick, gray dust, volatilizing cement, asbestos, papers, objects that were in the towers, which became part of the artwork. The dust produced by the collapse of the Towers hence contains the Towers themselves. It is the trace and the index of their collapse, carried far away by the wind until its disappearance in the atmosphere. That dust is now everywhere.

Art Spiegelman drew the Towers in his *In the Shadow of No Towers*, telling the story of September 11th – buildings are pulverizing in incandescent tones of fire and miniscule pixels. In drawing them he was reminded of his father trying to describe the smell of smoke in Auschwitz. The best description his father could come up with – recalls Spiegelman in an interview, smoking a cigarette – was the word "indescribable". And that is to him also the best way to describe the air in lower Manhattan after September 11th. Full of asbestos, biphenyls, lead, dioxin, and human shreds, Spiegelman calls lower Manhattan's air a witch's brew that made Chernobyl look like a spa.

In the nostril-memory of those who were in Manhattan that morning, lingers an unbreathable odor that still persists undiluted. It is the smell of the dust that had once been the Towers, built between 1966 and 1972 by Japanese American architect Minoru Yamasaki, mixed together with all the lives that were lost in the collapse.

Odorless Death

The most terrible and treacherous smell of death is non-smell. Killing by means of gas is a technique which has been used many times throughout history. According to the writings of Polybius around 187 BC, the Romans used poisonous fumes to flush the defenders of Corinth out from their underground tunnels. While asphyxiating gasses made of hydrocyanic acid, chloropicrin, arsine, and other components were used during World War I.

But it was the murder of Jewish people in the gas chambers of the concentration camps during World War II that made the atrocity of this type of death clear and proved odorless death to be unquestionably more lethal. The gas was called Zyklon B, a mixture of hydrocyanic acid and other poisons produced by the German firm Tesch & Stabenow and publicly passed off as insecticide.

It is an odor which risks being forgotten by those who did not experience it but one that still belongs to the survivors as Erri de Luca writes in *I colpi dei sensi*: «To that humanity exterminated with Zyklon B gas, whose odor has poisoned our century, and that no one knows».

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Unfortunately, the list of lethal substances employed for killing enemies or presumed enemies is as long as it is abominable: napalm, nerve gas, depleted uranium, white phosphorus, Agent Orange, just to name the better-known ones. The manufacturers of these "smart" weapons call them "non-lethal" – again, Zyklon B had been labeled as an herbicide – because they are supposed to be sprayed on enemies, not to kill them but to "incapacitate" them. They are tranquilizers, anesthetic gasses which include, among their official ingredients, valium and opium derivatives and who knows what other non-declared ingredients. They represent one of the most powerful markets in the world and not even the International Treaty on Chemical and Bacteriological Weapons can regulate it.

In 2002, the air conditioning system of one of Moscow's most beautiful opera houses was transformed into a death dispenser. A commando unit of Cechen terrorists barricaded in the Dubrovka Theater held hundreds of people hostage without any possibility of official negotiations. "Non-lethal" gasses were released into the air conditioning resulting in the death of 120 people. Of the survivors, or the "incapacitated", nothing is known.

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2. Emotion and Rite

Architecture as urns

Odors are often bridges between the here and now and the hereafter and it is perhaps for this reason that religious institutions will use incense, candles, unguents, and balsams of all types as instruments to guarantee their monopoly over souls. Offered as a gift to the gods by all ancient civilizations, perfume spiritually elevates and renders the body divine. It turns sacred places into urns.

The history of religious sites and places of worship is steeped in a mixture of purifying scents and cadaverous stenches, of heaven and earth, of horror and ecstasy, of ascension and inhumation, of sublimation (the upper reaches, heaven, the balsamic) and decomposition (the lower reaches, the grave, the underground, hell).

Olfactory compositions in these sacred sites have never been fortuitous. We might consider them as actual invisible architectures, forcefully and intentionally superimposed over formal, luminous, and acoustic ones. Their purpose was to serve as an emotional guideline for the faithful in order to psychologically condition their states of being and of participation.

In his *Journal of the Plague Year*, published in 1722, Daniel Defoe wrote that «If we were to go into a church when it was anything full of people, there would be such a mixture of smells at the entrance that it was much more strong, though perhaps not so wholesome, than if you were going into an apothecary›s or druggist›s shop. In a word, the whole church was like a smelling-bottle; in one corner it was all perfumes, in another, aromas, balsams, and a variety of drugs and herbs; in another, salts and spirits, as everyone was furnished for their own preservation».

In architectural terms, the movement which most strongly marked the shift from the urn to the ampoule was the *Glassarckitecktur* of Bruno Taut

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and Paul Scheerbart's. As opposed to the architecture that preceded it, which favored urn-like structures, i.e., a dark, enclosed containers with no ventilation, "glass architecture" introduced the idea of a transparent, openable, and breathable ampoule. These were the same years (1914-1920) in which glass became an irreplaceable material for packaging industrially produced perfume and the democratization of its use.

Bruno Taut's Glass Pavilion at the Cologne Werkbund Exposition in 1914 looked like the perfume bottles perfumer Françoise Coty had commissioned to René Lalique a few years prior. These were the same years when Adolf Loos renovated the façade of the Knize perfumery, whose packaging was being designed by Ernst Dryden, a student of Gustav Klimt.

Odor of Sanctity

If fragrance is a vehicle for the divine, then God is a dispenser of essences (and existences); the sacred is scented, and its places are impregnated with odors. Leaving one's body and being transported into the hereafter by a perfume is a positive sign for any culture or religion, whether it be incense, candles, wreaths of flowers, or the sandalwood branches used for traditional cremations.

All the way back in Ancient Egypt it was believed that Osiris would grant a delicate scent to those who breathed his breath. And those who visited him after their death would rest in peace because they had breathed his myrrh and incense-scented breath. The association between odor and sanctity was so explicit that the masters of the cult of Osiris would chew cedar gums to perfume their breath and gain a scented aura of sacredness, the same concept we now find behind toothpastes and oral hygiene products.

The Greeks had a specific funerary toilet which consisted in washing the body of the deceased with scented oils and wrapping it in scented sheets before sending it off on its journey to the Elysian Fields.

In pre-Christian world the invisible presence of the divine could be sensed through the indescribable smell of ambrosia. And in Christianity sanctity was also thought to emanate a scent. Christ arose from the dead amidst the scent of myrrh and aloe with which he had been anointed after the Deposition. Henceforth the saints, their wounds and stigmata, did not smell of rotting flesh, but emanated a delicate perfume like those of Saint Francis or Saint Clare, smelled of violets like Padre Pio.

In Christianity, a scented body, even if poor or ragged, is considered a positive sign and may even embody a vocation for saintliness. The

deceased are still to this day perfumed prior to burial. That way – somewhat cheating natural processes of putrefaction – they will emanate a sense of sanctity.

Nonetheless, among all religions, Christianity has always been the one characterized by fluctuating views on perfume used as a bridge with the divine. While on the one hand the Church condemned the personal, Dionysian use of perfume and limited the use of scents in its own rites only to incense and flowers, it also on the other hand promoted more urban religious rituals and celebrations that were actual olfactory performances. During the rite of *Corpus Domini* the streets are paved with multicolored carpets of flower petals for the passage of the "Body of Christ".

A work by J. G. Décosterd and P. Rahm titled *Il Buon odore di Cristo* [The Sweet Odor of Christ] – created for the Dal Paradiso all'Inferno [From Heaven to Hell] exhibition in 2004 at the Fondazione Bevilacqua La Masa in Venice curated by Giacinto Di Pierantonio – fully expressed this idea of the *odor of sanctity*. It was an upside-down mushroom hanging from the ceiling all the way down to the floor that emanated a smell of incense, myrrh, and cinnamon. The idea is that holy odors, impregnated with sanctity, are veritable placebos: they soothe, beatify, heal.

Earthly Paradise and Heavenly Garden

If the hereafter is a scented realm, then its iconography will faithfully adhere to its metaphors. A sky filled with fine, icy air. A garden of earthly appearance yet much more luxuriant and sweeter. The Elysian Fields with five hundred scented fountains. The great prairie. The Earthly Paradise described in the book of Genesis is a garden that offers all one could wish for, where all is blooming and bursting with ripe fruit.

We all know what happened in the end. Eden has remained an expression of most of humanity's desires and damnations d, at least among the Abrahamic religions, which since its fall have been trying to recreate it on Earth in all sorts of versions and dimensions. In the Old Testament's Song of Solomon another garden had previously been described. It was an enclosed, sealed garden – «[…] an orchard of pomegranates, with the most pleasant fruits; camphire, with spikenard […] and saffron; calamus and cinnamon, with all trees of frankincense; myrrh and aloes, with all the chief spices […]» – which somewhat evoked the virginity of the lover. The Hanging Gardens of Babylon would then attempt to turn this dream into a concrete reality.

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The idea of the celestial garden can also be found in other religions. In the Taj Mahal in Agra a plinth with a bas-relief of flowering plants runs along the interior and exterior walls of the temple surrounding the cenotaph and the external structures. If Paradise is a garden, then there couldn't have been a more appropriate symbol to make the tomb rise from a field of flowers.

The Alhambra Gardens, conceived as a metaphor for paradise and its foretaste on Earth, are an interpretation of the spiritual yet sensual Islamic civilization, concentrating sophisticated beauty and light hedonism.

A work by Décosterd and Rahm sought to bring this idea into an olfactory dimension. For New Year's 2003, they created an installation at the Fondation Cartier pour l'Art Contemporain in Paris titled *Paradise Now*, based on the contemporary spatiality of the ineffable. With no materiality or physical limits other than odor, *Paradise Now* was an inter-religious version of the earthly paradise, or celestial garden, which converged in the olfactory dimension: musk, aloe, milk, and honey as fragrances of the Islamic paradise with an extra touch of incense and wine for Christian heaven.

Gardens

A garden has always been a place for constructing emotions through rites, planting, care, and harvest. It is by definition a grand bouquet composed of a particular combination of plants, trees, and flower species, varying with the seasons and the arrangement of the scent sources. It constitutes a natural scale version of what perfumers seek to capture in a bottle.

The history of French, English, or Italian gardens is far too vast to be exhaustively addressed in this book, but we can use our imaginations to grasp the olfactory orgy that could likely be smelled din each of these types of gardens.

The planning for a garden is extremely complex because the invisible dimensions and variable dynamics of odors are more evident here than elsewhere.

The antithesis of the blooming garden is the Zen rock garden. Here plants are replaced by stones and the soil by granite or clear marble sand. The Zen Garden does not seek to seduce the senses but to ignite meditation.

In order to outline the ways in which gardens are still to this day spaces for olfactory design we have looked at works by Petra Blaisse and at a peculiar Zen Garden designed by Yukio Nakagawa.

The works of Blaisse are particularly interesting in regard to the development of the concept of contemporary garden. Here the Dutch artist does not maintain the sharp distinction between natural and artificial but instead creates a threshold where the artificial is naturalized and the natural made artificial. One of her current works is the *Library of Trees* in Milan, which will include trees of different species as a living archive of scents and essences.

In 2003 Yukio Nakagawa designed an installation titled *Onde onirique* [Oneiric Wave] at the Hermès exhibition area in Tokyo. The work was displayed for three months, it had all the typical characteristics of a Zen Garden, but it had been scented with clouds of lavender laid out on the ground. Seven hundred kilograms of lavender blossoms shaped lavender and cobalt-blue waves that had been arranged together with red, blue, and white bubbles in a dreamlike world that enveloped visitors in its delicate perfume. In another recent work, *Tenku Sange* [Paradise], Nakagawa created a multicolored, scented rain composed of 200.000 tulip petals. The geometric space remained still while the olfactory dimension was dynamic.

Secrets

The *Hortus Conclusus* inspired from Chapter 4 of the Song of Solomon, «A garden enclosed *is* my sister, *my* spouse; a spring shut up, a fountain sealed […]» not only expressed the idea of a garden but was also a metaphor for virginity. From an architectural standpoint it is an enclosed garden containing the flowers which are the symbol of paradise. This type of garden provided inspiration for the cloisters in Medieval convents, which are also where the systematic classification of plants began.

Damascus is a city full of gardens, all hidden behind high walls. They are invisible to the eye but not hidden from the sense of smell which allows us to imagine them in all their authentic charm. Damascus is another capital of the rose. Its perfumers were always skillful extractors of essences used for tapestry as well as to "tint" houses with perfume. It is said that when Saladin conquered Jerusalem, he brought five hundred camels laden with rosewater to purify the city before his triumphant entry.

Arabic culture is full of tales of secret gardens burgeoning with flowers. In the first lines of Arabian Nights' *Sinbad the Sailor* we have an exhaustive description of one of them: «One day; during the most violent heat of summer, [Sindbad] was carrying a heavy load from one extremity of the city to the other. Much fatigued by the length of the way he had

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come, he arrived in a street where the pavement was sprinkled with rose-water, and a grateful coolness refreshed the air. Delighted with this mild and pleasant situation, he placed his load on the ground, and took his station near a large mansion. The delicious scent of aloes and frankincense which issued from the windows, the sound of a charming concert issuing from within the house accompanied by the melody of the nightingales, and other bird's peculiar to the climate of Bagdad, added to the smell of different sorts of viands, led Sindbad to suppose that some grand feast was in progress. He wished to know to whom this house belonged».

That of the secret garden is also a recurring theme in design. Even Le Corbusier designed one on the rooftop of the Beistegui apartment in Paris in 1930: a ceiling-less room with a lawn instead of pavement, poetic evolution of the rooftop garden.

Martha Schwarz's Splice Garden on the roof of the Whitehead Institute in 1997 is almost an homage to Le Corbusier. Irrigation was not possible on the small roof of the building, and so the artist decided to create an ironic design which would divide the garden in two. In one half she created a pop-Zen Garden with artificial plants instead of rocks. In the other half she set up a fake French Renaissance Garden also using artificial plants. The scents were left completely to the imagination.

Sulfur

If incense is the aroma of the divine, then sulfur is the exhalation of hell.

Tartarus, the underground city of punishment and torment, was a nauseating place, a sinkhole of abominable reeks, but above all a place where olfaction was a means for measuring crime and applying punishment. The nose was a meter for assessing the magnitude of sin. It filtered the mephitic stench of hell which, according to the moral, smelled like a latrine.

In Christian tradition, malodor has always been considered a representation of evil, and in its literature hell is referred to as a poisonous pit, a shadowy foul dungeon to which bodies and souls are condemned. In the *Divina Commedia* [Divine Comedy], Dante Alighieri drowns the simoniacs in excrement, the sluggard in the vile reek of the Styx, and condemns counterfeiters and alchemists to scabies and leprosy. Torquato Tasso in the *Gerusalemme Liberata* writes, in regard to the mouth of Hades, who rules over hell: «So from his mouth flew kindled coals about, hot sparks and smells that man and beast would choke».

Today's cities stink no less than ancient ones, as we may infer from reading Süskind's *Perfume*. Cities standing on volcanoes stink even more because the volcano's vents fill the air with sulfur, the unmistakable odor of rotten eggs.

The book *Mediterraneo* by Studio Azzurro recounts that «In Naples, as in many cities of the Mediterranean, the soft subsurface is dug out into a labyrinth. You descend into the earth in the center of the city and re-emerge together with the vapors of the many small foundries that have established a habitat there below… In slow motion the incandescent matter is released upwards, transforming the earth into pure vapor. This imaginary cloud moves through the rough cavities of the earth away from the unbearable heat, it spreads out in the cones that naturally aspire upwards towards the yellow sulfur-rimmed orifice, whence it issues forth liberated from the compression and darkness of the grotto. At that point it becomes completely white and rotund and vanishes into the sky».

A project that works along these lines is Vulcania, the European Volcanism Park near Clermont-Ferrand designed by Hans Hollein in 2002. The center of the structure is wholly integrated into the basaltic rock of the landscape, from which it emerges as a regular conical structure covered in basalt. The inside of the cone is coated with golden steel reminiscent of the internal heat of a volcano. Part of the building is dug into the ground, with galleries and rooms lit from above, entirely faced in layers of lava and in perfect harmony with their context.

The Place of Fire

Once primitive men grasped the importance of fire, questions rose as to how they could bring it inside the house without burning it down. They learned how to tame it and keep it alive by nourishing it with wood, bushes, and dry grass – the smell must have been so intense that it suggested other possible, tasty, uses of it. The place of fire in architecture is key to understanding the evolution of certain types of buildings.

Initially, fire was near the entrance for reasons that are easy to imagine, and the house would consist of two similar rooms, one for sleeping and the other for daytime activities. Rooms were later diversified as we see in the Greek *megaton* found in Mycenae, consisting of a hall and an antechamber. In order to prevent excessive heat loss, fire was then placed in the center of the building, resulting in a court-like structure used in monasteries and European universities. Temperature regulation, and thus the fireplace, held a central role in laying out the disposition of

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the rooms. Smoke was expelled through the roof via a central chimney. In order to hang in the chimney all which needed to be cooked, chimneys had to be enormous, as big as a room and as tall as a tower. It was only when the fireplace lost its central spot and was moved towards the walls, that buildings developed their rectangular structures. When fireplaces began to multiply and be located in two, three, or more parts of the house for various functions – heating (fireplace), cooking (kitchen), lighting (candles, oil lamps) – the modern house was born.

Heating. The Twentieth century architect who dedicated the most energy to thinking about where to locate the fireplace was Frank Lloyd Wright. During the World's Columbian Exposition of 1893 in Chicago, he fell in love with Japanese architecture, which he would then seek to reinterpret in all of his life's works. An explicit reference was the *tokonoma*, the permanent element in Japanese interiors which will feature in many of Wright's houses. The core of the house becomes the fireplace and other elements are distributed in relation to this main attraction, heart of contemplation and of ceremonies in symbolic and micro-environmental terms.

Cooking. Kitchens would also undergo their rationalization process in those same years. Back in the Eighteenth century the introduction of the stove with more than one burner had already paved the way for new culinary techniques. But it was not until 1869 that a sort of movement which studied the management of fire and the way it related to cooking was born. Catharine Beecher and Harriet Beecher Stowe published their *The American Woman's Home*, partly inspired by the rationalization of galleys on ships. In 1913, Christine Frederick published *The New Housekeeping. Efficiency Studies in Home Management*, which translated Taylorist labor optimization into the kitchen. In the 1920s the manual arrived in Europe and was translated into many languages. Its translation into architecture is found in the *Siedlungen* [Housing Estates] projects of Ernst May, as part of which Margarete Schütte-Lihotzky would design her famous Frankfurt Kitchen, the prototype of the modern installed kitchen and a sort of *manifesto* regarding rationalization of the domestic environment and its flows, as well as a milestone in women's emancipation, not only in the home but also in architecture.

Lighting. The advent of electricity would slowly abolish oil and wax lighting thus eliminating their impregnating odors from architecture, bringing eternal day into buildings alongside all the ingredients of modern living: air, light, heat.

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Per Fumum

In ancient civilizations "perfumes" did not exist as such– flowers, aromatic plants, and resins were used as offerings to the gods. With time, the use of odorous substances intensified, and an olfactory aesthetic was born. It involved more elaborate products such as fumigation, oils, balsams, and brewed liquors, all used nevertheless mainly as means for approaching the divine.

None of the great Eastern empires was ever as religious yet at the same time in love with perfumes as ancient Egypt. In the early 2nd millennium BC, the first expedition to modern-day Eritrea resulted in the discovery of incense, myrrh, and the shrubs they were extracted from. Conquests to the east gained them storax, cedar wood, galbanum, and bitumen. From the Far East came benzoin, cardamom, cinnamon, and pepper. Some of these substances were used in the morning rituals of the reawakening of the statue and others in the rites of the unction of the altars.

From this practice of burning raw materials stems the word "perfume", which derives from the Latin *per fumum* "by means of smoke", through nebulization, the airborne transformation of a substance. In ancient times, in fact, methods of perfuming the body were the same as those for perfuming places – both were accomplished by means of fumigation. "To fumigate" was a synonym of "to purify", both in religious and hygienic terms, and this practice soon translated from temples to homes.

Two fundamental rituals associate scented substances with the worship of gods: fumigation and unction.

Burning substances which enhanced their own odor, would rise upwards and get dispersed in the air, reaching the divinities. Aromatic woods and resins, as well as incense, became the best and most coveted ingredients.

Unction on the other hand involved spreading oil or scented, consecrated paste on specific sections of sanctuaries, on altars, statues, objects of worship, on the head and the hands of rulers, priests, sick people, on weapons, on house entrances, and on anything which needed glorification or preservation. Eventually scented essences – myrrh, spices such as cinnamon or musk – would even be added to mortar during the construction of mosques, so that during the hottest hours of the day, the heat of the sun would enhance the perfume and thereby the mystical aura of the site. The eighty mosques of Harar still give off, to this day, the scent of myrrh.

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Listening to Incense

Incense, or *koh*, was first introduced in Japan in the Sixth century by Buddhist monks who would employ it during their purification rites. Made from aromatic wood, incense became so ingrained in Japanese culture that over the centuries schools which taught the art of using it were established. Incense traces back to the long history of Japan's rituals and symbolic sites, – it's an ancestral practice which had to face, and deal extensively with, the modern rise of industrialization. At the Chicago World's Fair in the late 1800s Japan took part exhibiting for the first time the small cone-shaped incense we know today.

Koh-do, or "listening to incense", is a dedicated ritual which over the centuries was elevated to art form status. It consists of a training aimed at recognizing and tasting this fragrance through specific ritualized steps similar to those of the tea ceremony. Three types of wood are used in the ritual: *Byakudan* (sandalwood), *Jinkoh* (Ginkgo biloba), and *Kyara* (a kind of wood more valuable than gold itself).

Sandalwood is very important because of its specific use in architecture ì: it is strongly scented and resistant to worms and mold; it is a natural bactericide, and it thus preserves its olfactory properties over time. The two-thousand-year-old sandalwood door of the temple of Somnath still emanates its natural scent.

The *koh-do* ceremony takes place in a room in the presence of some fifteen people seated on the floor in a square. Each participant holds a sheet of paper on which they record their impressions or observations of each piece of incense handed to them. The *komoto*, the leader of the ritual, provides a cup-sized brazier containing rice ashes in which lies a piece of hot bamboo coal. A small slab of *mica* holding the incense is placed on top of the brazier. This way the heat allows the fragrance to be released into the air without it burning. The *komoto* then inhales the incense and passes the cup to the person to their left who generally is the most esteemed person of the ceremony The round continues clockwise all the way back to the komoto with each participant writing down their observations At the end of the ritual each person interprets their notes summarizing them in a short story, in a poem or, for the more experienced ones, through the visualization of a space.

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Tobacco

In our smoke prohibition era, to enter a house, an office space, a public place, or a car and smell cigarette smoke might make one feel confused, caught off guard, for we are getting more and more disaccustomed to it and hence perceive it as an invasive, persistent smell.

In a way, we have returned to the times when tobacco was first imported into the West. It was one of the strange things Columbus had brought back. He had first seen it in Cuba, where the indigenous people of the *tainos* used to bring to their mouths "firebrands from which they inhaled smoke". Like all invisible things, it had been initially regarded as "the Devil's weed" and condemned by the church and the monarchy. It later started being used as a therapeutic remedy as well as a decorative object. In the Seventeenth century the Gantiers-Parfumeurs would then scent tobacco with jasmine, rose, lily of the valley, hyacinth, amber, and musk in accordance with the prevailing tastes of the times.

In the bourgeois household cigarette, cigar, and pipe smoke would then go on tracing invisible yet indisputable boundaries between the female and the male parts of the house. Smoking rooms did not arise for hygienic purposes, rather to embody a symbolic masculine space laden with all the misogynistic values of Nineteenth-century bourgeois culture.

There are people and places which cannot be imagined without the smell of smoke as if this were ingrained in their very identity. Places such as Cuba or Seville, where some of the world's first tobacco factories were founded in 1676, have a history which is deeply rooted in tobacco and hence some of their most iconic spots are drenched in its smell. The architectural typology known as casas de tabaco was created specifically in order to follow the various phases of production in which leaves are left to dry and cigars are made. These wooden structures are characterized by wide openings and specific grates on which leaves are hung up to dry allowing natural ventilation to come through. The architecture of cigars, their life cycle and taste are all connected to air, sun, humidity, and water. To preserve all of its qualities, each type of cigar must be allowed environmental conditions similar to those of its tropical country of origin. They are kept in a relative humidity of 70%, stored in breathable containers such as cedarwood boxes which ensure the proper humidity level while also allowing the air to circulate.

It was Zino Davidoff who, in the early twenties, founded in Geneva Europe's first humidified cigar-storage cellar, revolutionizing the world of cigars by combining the ritual of smoking to that of wine tasting and bringing both into the world of luxury.

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The Tea Ceremony and Coffee Rituals

If we were to compare what Agatha Christie wrote in *The Mysterious Affair at Styles*, «You will feel better after a piping hot cup of tea, madam», to the words of Eduardo De Filippo in *Questi Fantasmi*, «When I die, bring me a cup of coffee and I will rise from the dead like Lazarus», we would note the profound differences between these two scenarios. The world of tea and that of coffee are not just culturally, geographically, and spatially separated, they are indicative of two ways of life that perhaps only now are beginning to reconcile.

Both are characterized by the infusion of substances, leaves or seeds that release very peculiar aromas into the air when they come into contact with heat and steam. The more territorial part of these rites is that of the drying of the leaves and the roasting of the coffee beans, which are two processes that release their unmistakable odors into the air and which at times serve as landmarks. There are entire regions in India, such as Assam, where tea leaves are dried for all the major export brands, or others like Minas Gerais in Brazil which are entirely dedicated to coffee cultivation and roasting.

Their pervasive odor and the ritual of their preparation made them "potions" even before they were thought of as beverages. Tea was originally drunk by Zen Buddhist monks, who would sip it in order to stay alert during meditation. Coffee was used in religious rites and for its healing properties. Like all rites, both have always had a public and a private dimension characterized by specific places and utensils (teapots and coffee pots) to guarantee the quality of the drink. The tea house and its ceremony are the synthesis of the traditional Japanese architectural module. The tea ceremony (*chado*) is not merely a rite, but the primal matrix of a specific way of life. *Chado* is carried out in a dedicated pavilion built inside a traditional garden. The pavilion is modestly decorated: a vase with flowers, a *kakemono* (hanging scroll), and the utensils required for the ceremony.

The protagonist of the rite is *matcha*, the green tea powder onto which boiling water is poured. The infusion is then whipped with a wooden tool in order to mix it properly as well as to release the vapors into the air. The rite then continues with the serving of tea which follows a very thorough ceremony.

Tea is also the rite Great Britain exported to its colonies and thus one associated with well-furnished quarters, aromatic woods, and heavy tapestries which decorated British style houses. It was a time-odor because it marked the end of the workday as well as a social status.

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Coffee had a parallel life whose routes would go elsewhere and sometimes cross those of tea – both loaded on the same cargos in the same harbors and in the same ships. Originally called "wine of Arabia", it was not until the Fifteenth century that it gained such status as that of a symbol of conviviality, so much so that two cafés were opened in Istanbul. The Catholic church kept it away from the Sacred Empire because it was "too Islamic". It was not until the Seventeenth century that coffee began to be imported to Venice from Cairo. The passion for coffee then spread to central Europe, and from there to France and to the rest of the world.

The rite of coffee then split into two. The Italian bar tradition of espresso coffee and the long coffee tradition served in larger cups and generally accompanied by pastries Cafés became important places in Europe, showcases for politics, culture, and lifestyle. Cities like Vienna became capitals of cafés so much so that even architect Adolf Loos designed one in 1899: the Café Museum.

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3. Marketing and Time

Conservation and Acceleration

Salvador Dalí believed that out of the five human senses, smell waste the one which better rendered the idea of immortality. Perhaps he wanted to emphasize olfaction's vocation for manipulating the time which makes up the lifespan of an odor, while also being its greatest enemy. The temporal cycle of an odor can follow a natural rhythm, but it can also be programmed, accelerating or decelerating its aging and transformation processes, thus altering its duration.

The connection between time and smell is also explored by Marshall McLuhan in *Understanding Media: The Extensions of Man*, where he writes that both the Chinese and the Japanese up until the Seventeenth century would measure time by gradations of incense – according to the specific sequence of scents they would measure hours, days, as well as seasons.

The three phases that make up the duration of an odor (head, heart and tale) are characterized by different timeframes, intensities, and qualities. Planning the duration of an odor is, for different reasons, subject of great interest for both marketing and the art world. Both seek to enhance or exaggerate the performance of the product, but they develop the relationship between space and olfaction in two different ways: one seeks to recover, almost philologically, the odors of materials, bodies, and spaces, often making them into exhibition pieces; the other tries to separate cause and effect, using odors as an end rather than a vehicle for experience. The identity of a place is partly determined by its smell. If this identity happens not to be particularly significant, then it can be created or even bought.

There are two art works, both working with natural elements, which perfectly render the idea of processes of acceleration and conservation:

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Earth Room III by Walter De Maria (the first installation dates back to 1977) currently displayed in a New York gallery, and the installation by Zaha Hadid and Cai Guo-Qiang for the 2004 *Snow Show* in Rovaniemi.

Walter De Maria's third piece in the series, *Earth Room*, is a room full of loose, odorous soil, moisturized by a system that controls the relative humidity preventing it from drying. The sense of humidity and conservation is profoundly felt. The spectator seems to breathe in an eternal, ancestral experience, the same emotion one might feel in front of something that has always been there, even though it is clear it's not the case.

The constructions by Hadid and Guo-Qiang for the *Snow Show* in Rovaniemi, consisted of two mirrored landscape formations, one made of ice and the other of snow. At one point, the Chinese artist would sprinkle vodka on top of the snow structure, causing the snow to liquefy and initiating movements of water, fire, and air. The fire lines would shape the forms, softening the corners and creating a constantly mutating profile. All was quickly consumed, including the architecture itself, in a sort of fast-motion film shot.

Greenhouses

The Nineteenth century, time of hygienist reclamation of lands when smell was considered synonym for unhealthiness and filth, was when the World Fairs which would constitute the first exercises in glass and iron industrial architecture began. There were no ready-made models, so the architects borrowed them from elsewhere: railway stations, bridges, greenhouses. Specifically, the latter became model for the pavilions at the international fairs.

In Alessandro Baricco's novel *Oceano Mare* [Ocean Sea] there is a very vivid rendition of the Crystal Palace, described as an enormous greenhouse with only three gigantic elms inside, actual nonsense from the look of it, the narrator states. He says one has to imagine the place filled with thousands of people, with all its fixtures and objects brought in from all over the world, a huge organ made of reeds, fountains, wooden tapis-roulants, bits of ships, egyptian statues, locomotives, submarines, fabrics of all colors, unstoppable weaponry, never-seen-before animals, musical instruments, paintings as big as walls, flags hanging everywhere, pieces of jewelry, flying cars, tombstones, artificial lakes, plows, globes, cogs, carillons. He goes on imagining all the sounds, the voices, the odors, the thousand odors.

After all, what were greenhouses if not enormous glass ampoules in which scented flowers and plants grew? The Nineteenth century was

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marked by the emergence of mass production, of industrial processes, of the first synthetic products. In architecture as well as in perfumery the attempt was made at combining natural components with synthetic products and advanced materials. Nevertheless, it took some time for engineers to achieve architectural elegance and for alchemists to get to the refinement of modern perfumes.

There are numerous ampoule-like buildings. One of the pioneering projects was 1945 Buckminster Fuller's Dymaxion House, a prototype of an energy-efficient house that never went into production. It is part of the permanent exhibition at the Henry Ford Museum in Dearborn, Michigan. It was a spherical structure like the bell of a jellyfish. There was a nebulizer-shower to minimize water consumption and the entire dome of the house could rotate to take advantage of the wind for natural air conditioning.

One of the most extraordinary projects of this kind is the 2001 Eden Project by Nicholas Grimshaw & Partners in Cornwall. The skin of the building, a sort of second sky, encloses a microcosm, and its lightness counteracts the dizzying immensity of the self-supporting domes, up to 124 meters in diameter. They are double-skinned geodetic domes, the external skin is made of ETFE (Ethylene Tetra Fluoro Ethylene Copolymer) pillows inflated by compressors. The weight of the entire construction is lower than that of the air contained within it. The greenhouse does not only contain exotic plants, but also more common ones such as hot pepper, tobacco, cotton, tea, and coffee.

Another r greenhouse is the one which will be built in San Francisco, the world capital of environmentalism, by the Renzo Piano Building Workshop, as an expansion of the California Academy of Sciences. It will take the place of the current pavilions which have been there since 1916 and it will be characterized by a large rectangular roof with soft ripples in elevation. The roof will be almost completely covered with vegetation except for some glassed-in free portions. The building will be an efficient, integrated active/passive thermal engine. The most significant innovative design aspect is the natural "chimney effect" ventilation system, which captures the humid and temperate sea wind allowing the facility to cool in the summer and supplementing the heating system in the winter. Air enters through the receptacles on the southern wall, warms up thanks to the greenhouse effect, and is extracted and delivered to the exhibition area through mobile ports in the roof. The power will derive substantially from the acceleration of air near the exits. The building will be partially powered by photovoltaic cells on the south-facing surfaces, while water management will be accomplished using sea pressure to fill underground tanks that will regulate the temperature of the floor.

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The Genie of the Lamp

Scents and cosmetics are two tightly intertwined realms, not only for the characteristics of their ingredients and products, but especially because they share the same aspirations and vocations. A perfume in a bottle may be considered a genie in a magic lamp, its mission is always to be vehicle for desire, pleasure, seduction, memory, getting closer, holding on, loving, and power, as if by opening the bottle which contains it, the perfume will emerge granting one any wish in its ethereal, genie-like form.

There is a passage in *Arabian Nights* in which the genie is described in a way that makes him similar to a perfume: «He examined the jar on all sides; he shook it to see if it would rattle. But he heard nothing, and so, judging from the impression of the seal and the lid, he thought there must be something precious inside. To find out, he took his knife, and with a little trouble he opened it. He turned it upside down, but nothing came out, which surprised him very much. He set it in front of him, and whilst he was looking at it attentively, such a thick smoke came out that he had to step back a pace or two. This smoke rose up to the clouds, and stretching over the sea and the shore, formed a thick mist, which caused the fisherman much astonishment. When all the smoke was out of the jar it gathered itself together and became a thick mass in which appeared a Genie, twice as large as the largest giant».

A perfume is a bit like that – an invisible shape which fulfills a wish.

Boulée's cenotaph was never built, but the feeling it would have certainly generated is that of finding oneself in a huge perfume bottle, in a utopia-scented air bubble.

The tangible air bubble sensation can be found in a number of installations by Argentinian artist Tomas Saraceno who, in 2005, displayed his *In-form the air: Air Under Different Pressure* in an art gallery in Genoa. A transparent PVC membrane was filled with air to create a giant six-meter-high bubble which adjusted to the walls of the room leaving air space above it at a different pressure, allowing visitors to "take a stroll" on top of the bubble. The air pressure inside the bubble was higher so that one would feel it in their eardrums, without it being excessively bothersome. The visitors suspended on top of the bubble looked like figures in relief from a Seventeenth century ceiling. The pressure of their bodies on the membrane allowed the air to circulate inside the bubble.

These installations are all temporary architectures that introduce the body into the ampoule as an ingredient of the magic.

Martin Ruiz de Azúa's *Basic House* (1999) comprises a one-person bubble coated with PVC film that expands under the heat of the sun.

Some performances of contemporary artist Victorine Müller – such as Gate C (2003) and Timeline (2005) – involve the artist herself or other people inside inflatable ampoules. In the 1970s Superstudio created the *Città delle Semisfere* – 10,044,900 sarcophaguses made of transparent material containing motionless individuals with their eyes closed, kept alive by breathing conditioned air and nourished directly via their blood.

Vacuum-sealed

Unlike wine, perfume does not improve with age. Instead, it changes, degrades, denatures, and eventually evaporates. However, a good number of precautions can contribute to preserving it. Light, heat, and humidity are perfume's worst enemies, oxidizing or otherwise breaking down its fragile molecules. It must be shielded from ultraviolet rays and protected against evaporation. It should be isolated from other materials and surfaces to prevent degradation caused by bacterial contamination. Coolness and darkness are excellent allies in scent preservation, but subzero temperatures and vacuums are even greater ones.

Once again, the ancient Egyptians were way ahead of their time even on this matter. We ought to think of pyramids as a place where the door was a filling port rather than an entryway.

Storing things in a vacuum is not just a technique for preserving them through time. It is also a hygienic and organoleptic means for maintaining the qualities of the product unaltered. This is the idea behind Marcel Duchamp's 1919 work *Air de Paris*, a glass test tube filled with "authentic Parisian air". It was one of his ready-mades and a souvenir that Duchamp first gifted to his friend Walter Arensberg. Using the same concept in 1961, Piero Manzoni created *Fiato d'artista* [Artist's Breath], a series of 45 "air bodies" that were nothing more than balloons inflated with the artist's own breath.

The Medium is the Message

It's a famous quote of Marshall McLuhan who in the sixties, in the Pop Art era, claimed that there is no message outside the medium itself. Communication by means of perfumes has always been true to this principle. Fashion and perfumery have always shared the same aesthetic dictates. There is a vast literature dedicated to the world of perfumes,

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especially to that of fine fragrances, which explains above all why, starting from a certain point in the 1900s, stylists decided not only to dress us in their clothes, but also in their fragrances. It must be said, though, that the practice of wearing scented objects and perfumes to extend one's aura beyond one's physical body has always existed.

During the ancient Egyptian New Kingdom (1570-1085 BC) guests attending celebrations would place cones of myrrh or animal fat in their hairpieces in order to create an invisible aura that enhanced their charisma. The cones would release vapors which looked as if they emanated from the face itself.

The Romans too were obsessed with perfumes, scented rooms and events. Nero was so intensely seduced by this world that he would wear an overabundance of scents. Celebrations were carried out in which rose petals were suspended from the ceiling in nets which were later dropped in order to shower the guests with a scented rain, so many petals were dropped that at times they would almost suffocate the guests. Throughout the Imperial age rose petals were scattered on seats at the circus, and spectators were sprayed with scented essences. Things reached a peak of excess with Heliogabalus. It is said that one of the determining factors in the final collapse of the Roman Empire was the depletion of the state treasury by the heavy costs of importing incense and perfume.

The Eastern and Arab worlds were always familiar with perfumes, which reached the West with the return of the Crusaders and first entered the market via the trading networks of the seaboard republics: Pisa, Amalfi, Genoa, and Venice.

In that period one of the most important perfumes was dried myrtle leaves, an especially strategic essence because it was also used in leather tanning. One of the modern world's perfume capitals, Grasse, began its history with scents precisely by trading myrtle leaves, which were also used in the flourishing local tanning industry. Florence has a similar history in this regard.

Towards the end of the Eleventh century the Crusaders brought back rosewater, musk, and amber, substances would be banned by the Catholic church all the way until the Seventeenth century when a Franciscan friar, Domenico Auda, began to trade a sacred-profane water for churches and the dwellings of nobles. It was a sort of scent used to perfume homes and churches with the same beatifying scent.

It was in the Eighteenth century that perfume regained its status of unparalleled aesthetic expression for it was believed that perfume corrected ugliness, exalted appearance over reality, adorned the body, and decorated spaces. The apotheosis of this aesthetic of illusion was the court of Louis

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XV in France, also known as the "perfumed court", where it was actually mandatory to use a different perfume every day.

Hygiene was rediscovered and the more refined noses began to appreciate more delicate perfumes that made the fortune of the first grand Parisian *maisons*. The chemists in Grasse prospered and enormously improved their techniques of *enfleurage* and distillation. In Cologne, Jean-Antoince Farina introduced the first Eau de Cologne.

Two were the scents that marked the end of the Monarchy and the beginning of the French Revolution. One was the perfume worn by Marie Antoinette, who, as legend has it, was betrayed by its unmistakable fragrance as she was trying to flee. The other is the odor of gunpowder which pervaded the streets of Paris during the armed clashes.

Strongly associated with the squandering at the court, perfumes disappeared for a while until they came back in vogue under the Consulate and the Napoleonic Empire. Empress Josephine squandered a fortune on exotic perfumes and Napoleon was exaggeratedly fond of his Eau de Cologne rubdowns.

English empiricism also played a role in establishing the importance of the sense of smell, as well as of all other senses. It was a philosophy which thought of the senses as the source of all knowledge. Starting from the idea that the basis of all knowledge is experience, many scholars began to use their senses, smell included, more intensively.

In the 1800s the perfume industry grew exponentially, accompanied by a spread of the use of perfume among all social classes and the establishment of hygienist theories, which brought more people to the seaside and to spas.

The "vaporizer" first made its appearance at the 1868 Paris World's Fair, quickly consigning all other ways of applying perfume to oblivion as well as marking the end of the traditional, artisanal stage of perfumery. New discoveries in the chemistry of fragrances and aromas, and developments in the industry generated new needs and thus new products and olfactory delights.

Scents became the masks of the bourgeois ego. Perfumes were worn to exalt special occasions and no longer for therapeutic purposes. Perfumes parted ways once and for all with pharmaceuticals and established themselves as fully fledged cosmetic brands.

An extremely interesting period in the relation between perfumery, architecture, and design came at the end of the First World War, when Europe seemed to be imbued with winds of creativity and optimism. Black African Art took center stage at the Exposition of Decorative Arts in Paris in 1925. The Cubists gained acclaim, and a passion for Japan spread

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through the avant-garde movements. These were the years in which Coco Chanel revolutionized the image of women and, in opposition to overly sweet scents and white flowers, she invented one of perfume's greatest icons, *Chanel no. 5*, which is still an international top seller. It was the first time that a fashion brand created its own line of perfumes and, in a matter of just a few years, some of the most incredible perfumes of the Twentieth century were born: *Shalimar*, *Joy*, and *Arpege*.

Travel and Trade

Perfumes and trades of raw materials have often been the driving forces behind travel, commerce, and great discoveries. People have always come back from travels bringing along the odors of the places they visited. We have an extraordinary capacity to associate a traveling experience with one or more odors. Perhaps for places that are not familiar to us tend to activate our sensorial "compass", or simply because we are more relaxed, each traveling destination is associated in our memory with a very specific olfactory "postcard" that is more indelible than our visual memories.

Five or six thousand years ago there already were many civilizations that used perfumes: the Egyptians along the Nile, the Cretans, the civilizations along the Tigris and Euphrates, those on the Yellow River or the Indus, and those on the shores of the Baltic Sea. But the first city to combine trade in aromatic plants, perfume production, and the manufacture of perfume bottles was Corinth.

The East was the world's largest market for perfume ingredients, which were grown locally or imported from distant lands. Trade in these materials contributed to the prosperity of the Phoenicians, and to the foundation of Palmyra, Petra, and Antioch. Incense made the establishment of the kingdoms of Arabia possible, – their immense wealth lives on through the legend of the Queen of Sheba.

There is an invisible thread linking odors to the history of a series of cities over the centuries: Corinth in the Sixth century; Constantinople in the Middle Ages until it was conquered by the Ottomans in 1453; Venice, where the alembic was perfected and modern perfumery was born; and then France, with Grasse being the center of production and Paris the center of distribution.

The role of travelers was thus fundamental in the intermixing of olfactory ingredients from all over the world. Marco Polo, as recorded in Il Milione [The Travels of Marco Polo], came back from his expeditions with perfumes and spices, which ensured Venice had a monopoly in perfume

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markets in the Middle Ages. While the routes to the East were opened by the likes of Polo, Christopher Columbus was the pioneer of westward explorations, bringing home hitherto unknown ingredients such as vanilla, tobacco, and cardamom.

Physiological Architecture

The term "physiological architecture" was coined by Philippe Rahm and Jean-Gilles Décosterd to describe their approach to architecture, which deals with the interactions that the space outside the body can produce within the body. Their work focuses on the possibility of affecting physiological states through architecture, and thus on the ways of inhabiting architectural spaces.

Beyond the sensory perception of spatial agents, there also are other receptors which produce neither sensations, nor perceptions, but that alter nevertheless the state of the subject. These include photosensitive skin cells, receptors associated with the retina sending signals directly to the epithalamic and hypothalamic systems, humidity receptors in the upper respiratory tract, and vomeronasal receptors of volatile emanations such as pheromones.

Physiological architecture is noteworthy not just for the reactions it provokes, but for the almost complete absence of building in its theory. What occurs in their works is a clear manifestation of what normally occurs in people, only extended to an extra-corporeal dimension: breathing in the Hormonorium; sleeping in the Melatonin Room; and sweating in the Omnisports Room.

The Hormonorium was set up in the Swiss Pavilion at the 2003 Venice Biennale. It reproduced the feeling of high altitude, thus of hypo-oxygenation and lighting coming from below. The floor was a blindingly luminous Plexiglas platform which allowed UV rays to pass through its 528 fluorescent tubes emitting a white light which mimicked the solar spectrum. The light coming from below, unfiltered by one's eyelashes, would strike the retina which would consequently send signals to the pineal gland causing melatonin production to drop. The decrease of this hormone results in diminished fatigue and increased sexual desire, as well as in affecting one's mood. Air was the other fundamental component of the installation. It had been filled with nitrogen, hence decreasing the relative amount of oxygen thus mimicking high altitude air. This slight hypoxia would cause some initial disorientation as well as a faint euphoria induced by the production of endomorphine. The end result was one of 'doping' effect which resulted in roughly a 10% increase in one's physical performance.

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Another project was the *Jardins physiologiques* which explored the idea of creating an intra-corporeal landscape architecture that could interact with, and unsettle (planting, sowing, leveling, perfuming, poisoning), one's own internal garden by means of one's senses and one's brain's hormonal and thymic systems. The installation took the visitor through four "gardens" relating to different dimensions of perception. The first was an on-the-skin, tactile, garden in which the experience ranged from extreme softness to extreme prickliness. Then there was a garden of the nose, which varied from the sweetest to the most nauseating scents. The garden of taste encompassed the most delicious as well as the most disgusting flavors. The last garden took visitors through various states of the mind, from the most soothing to the most distressing.

Subliminal

In Süskind's *Perfume* there is an exhaustive description of why odors can be simultaneously wonderful and terrible: «People could close their eyes to greatness, to horrors, to beauty, and their ears to melodies or deceiving words. But they could not escape scent. For scent was a brother of breath. Together with breath it entered human beings, who could not defend themselves against it, not if they wanted to live. And scent entered into their very core, went directly to their hearts, and decided for good and all between affection and contempt, disgust and lust, love and hate. He who ruled scent ruled the hearts of men».

It is precisely this hidden but powerful domain, this inexorable power over emotions, that makes odors both attractive and dangerous. Modifying the smell of something means having an impact on the emotional sphere that drives one's choices. For this reason, the olfactory realm is the last frontier for marketing, communication, and art.

A Westerner entering a space and smelling lavender will immediately feel they are an aerated and clean place, even if it is enclosed and dirty. This exemplifies how the sense of smell can be much more powerful than sight. If one's sense of smell is in conflict with what one sees, they will instinctively trust the invisible olfactory sensation over sight. If, by some strange movement of air, the odor of boiled cabbage were to make its way into a Gothic cathedral, the image of the place through the beholder's eyes would be drastically altered – good-bye aura of mystic asceticism! We trust our noses more than we trust our eyes. It is no coincidence that many expressions for communicating trust or distrust use olfactory metaphors.

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Emotional Marketing

When Heraclites wrote «if all things were smoke the nose would recognize them», he was either expressing a comforting truth or an unacceptable naivety. In any case we can never overstate the fact that the sense of smell is both the most authentic and the most altered of our senses.

In the generalized system of creating copies and surrogates of reality, olfaction is one of the major accessories in making the false seem true, in order to increase the apparent realism of an experience that would otherwise be evanescent, and to support commercial, environmental, and artistic metaphors through sensory experience.

If the experiences where the senses are the means for giving the work unity and coherence are called "sensorial", those where the senses are the goal can be called works of "sensorialism".

When Brian Eno composed *Music for Airports* in the late seventies, the boundary between the artist's attempt to explore new musical territories and an unscrupulous commercial pursuit was not clear. When the phenomenon later became truly commercial with Moozak, broadcast into offices and stores in Japan and the United States, many were sarcastically perplexed.

And yet in the following years soundscapes became more and more a part of our lives, expanding the range of emotional and psychological states that a place is "allowed" to evoke within us without it being looked at with suspicion or irritation. For several years now, the same thing has been happening in the field of artificial deodorization of spaces. In a justified emulation of their auditory counterparts, one now speaks of tailor-made "olfactory landscapes". This is generally the case with places that have no specific olfactory identity. They are not necessarily "non-places" as Marc Augé would define them, but rather places with little personality. These tend to be the places which are better suited to new odors, for their lack of specific olfactory characteristics makes it possible to design new odors without having to get rid of pre-existing ones. Having determined that odor can communicate and exalt the experience of a place and enhance one's memory of it – as it already occurs during experiences such as a vacation or a date – our extremely consumerist society seeks to make even the more normal experiences "extraordinary", increasing their real impact, for example through their olfactory dimension.

Even back in Marco Polo's times, Chinese people used to perfume their fabrics and clothes with patchouli leaves and vetiver roots in order to make their customers desire to buy them. Nowadays a similar thing happens with cars, restaurants, hotels, and shopping centers, as well as

workplaces in order to increase worker productivity. In London's Heathrow Airport the scent of pinewood is released into the air in order to put people at ease. Many Japanese companies make odors over the course of the day to stimulate and enhance work: a bit of lemon in the early morning, flowers a little later, and forest scents in the early afternoon.

In shopping malls and commercial spaces scents are used to induce customers to linger, to tone down their aggressive impulses, to persuade them to buy, or to make an outrageously high price seem justified. In his book *Parallax*, Steven Holl writes about these places: «My recent stay at a Ramada Inn in the Midwest began in a lobby with no natural light (blank walls to a parking lot), which lead to a confusing series of Sheetrock-lined, carpeted, double-loaded corridors that smelled of perfumed cleaning fluid. Finally, the wood-grained Formica door opened to a polyester-carpeted 'large room' with vinyl wallpaper and an acoustic-panel ceiling. Though the smell was stifling, the anodized aluminum window was not operable. Synthetic (and sometimes toxic) interiors of typical lodgings scattered in polluted landscapes characterize today's throw-away environment».

Theft

In Nikolai Gogol's *St. Petersburg Novels' short story, The Nose*, the protagonist wakes up one morning without a nose. «My God, my God! Why has this misfortune come upon me? Even loss of hands or feet would have been better, for a man without a nose is the devil knows what – a bird, but not a bird, a citizen, but not a citizen, a thing just to be thrown out of the window. It would have been better, too, to have had my nose cut off in action, or in a duel, or through my own act: whereas here is the nose gone with nothing to show for it – uselessly – for not a groat›s profit!».

Designing with scents does not merely mean deodorizing spaces, but quite often purifying the air from existing odors and then perhaps re-odorizing the spaces. The household products industry has for decades been oriented towards products that could cover up bad smells, with no actual strategy regarding their elimination. It is certainly more difficult to get rid of an odor than it is to produce one or release it into the air. Ridding a space of odors requires such things as ventilation, air filtering, etc. One more chemically based process that is certainly very effective for purifying the air is oxidation through hydrogen peroxide. There also are filters, such as the Japanese *Black Cube*, based on silica gel, aluminum hydroxide, and kaolin. One disadvantage of these products, though, is that they work indiscriminately removing both unpleasant and desirable odors alike.

Other substances which purify the air include chlorine – which does in fact remove all odors but may leave one almost literally unable to breathe – and activated carbon, which is used in olfactometers and in air purification filters before air is mixed with another smelly substance.

An installation along these lines was *La Camera Linda* [The Clean Room] (1986) by Clino Trini Castelli and Marek Piotrowski. It introduced a special technical chamber, known as the *camera bianca* [white room], into the household. This sort of room is normally used to protect highly sophisticated equipment (as in computer rooms or control rooms). The air treatment affected the non-material components as well as the emotional reactions of visitors who were disoriented, finding themselves in a domestic setting with the sort of aseptic air typical of technological environments.

This brings to mind when Italo Calvino, in *Sotto un Sole Giaguaro* [Under the Jaguar Sun], states: «Epigraphs in an indecipherable language, half their letters rubbed away by the sand-laden wind: this is what you will be, *O parfumeries*, for the noseless man of the future».

Placebo

It has been asserted that perfumes can produce a placebo effect.

Paracelsus was the first to suggest that perfumes might be closely in tune with the human spirit, so much so that they could give places a certain magnetism, they could excite, depress, facilitate intuition, etc. On a number of occasions throughout history perfumes have been used as placebos, innocuous substances with the task of calming, soothing, and healing. During the bombings of London in World War II, the British would spray lavender in bomb shelters, not just to cover up unpleasant odors, but perhaps mainly to calm people's fear. The scent of lavender evoked a clean and reassuring sense of home, the exact opposite of their actual situation.

Odor is a vehicle for rendering an experience more enveloping and memorable. It both reinforces the experience and makes an illusory one more plausible. The scent of coconut oil may give one the impression that they are on vacation in the heat of the Maldives rather than on a lunch break in a freezing metropolis.

Following this absolute desire to stage a sense of health in an environment, other types of placebo-places, such as oxygen bars, have become very popular. The principle is as simple as it is perverse: to go to a bar to inhale oxygen scented with mint, eucalyptus, sage and basil, lemon, or ylang-

ylang. The goal is just to "pretend to be healthy", for the time actually spent inhaling, about 10 minutes, is nearly not enough to clean the smog out of one's lungs. However, the placebo effect is certainly achieved.

One of the more estranging works by Philippe Rahm and Jean-Gilles Décosterd is *Peinture Placebo*©, which is a way of "hoodwinking" the subject. It has been observed that the placebo effect triggers the release of dopamine (the neurotransmitter involved with satisfaction of desires and the generation of a sense of pleasure), which affects the brain's motivation and rewards the system. *Peinture Placebo*© was first introduced at an exhibition at the Paris Musée d'Art Moderne and involved mixing into otherwise perfectly normal industrial white paint an infinitesimal dose of ginger or orange blossoms. Visitors were asked to specify the purpose or nature of the room they were in without referring to any visual representations. The effect was such that the orange blossom room was considered relaxing, and the ginger room charged with eroticism. Although the cause was a placebo, the resulting effect certainly was not.

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4. Identity and Memory

"To smell"

If it is true that God created light *in primis* to illuminate the cosmos, it is also true that human life is associated with dust as a molding compound infused with the breath of life. In terms of the senses, the Genesis is a sequence: sight-hearing-touch-smell-taste. «And the Lord God formed man from the dust of the ground and breathed into his nostrils the breath of life; and man became a living soul». The earthly nature of man is thus emphasized: a composition of dust, whose life is not merely animal, but imbued with the divine breath of existence, the breath of God.

In Homer's Greece it was believed that thoughts and words came from lungs and that they resided there together with words that were heard. Words were linked with breath via a channel that connected the ears to the upper part of the mouth. While "perceive" meant "inspire" with the sense of drawing something in, the word for "look" in Aeolian meant "blow in the direction of»: visual perception was not merely a passive act, but rather an outward action. It implied an outward motion carried out by the breath. That it was thought of as a direct and active emission of air is better understood from the phoneme of the term used for "envy" – *ftonos* – which has an onomatopoeic sound akin to a puff of wind.

Aristotle hypothesized that the senses were all connected through the organs of respiration, and thus that respiration was connected to feelings and that lungs were the seat of consciousness and thought. There was a separation between mind and psyche. The former was located in the head and represented conscience, thought, and perception, the latter was localized in the breast, being a soul understood as the breath of life which, at death, exited the mouth (as an exhalation) and descended to Hades.

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Today this construct connecting thoughts and senses through breath has almost disappeared in all monotheistic religions, while it still can be found among peoples of animistic faiths – such as the indigenous peoples of New Guinea, who locate intelligence in the vocal organs – and in practices such as yoga and martial arts where a deeper meditation is achieved through breathing.

In English, this concept is expressed through the verb *to smell*, which is both transitive and intransitive, expressing that we both "perceive" and "produce" odors. It is an activity that has something to do with respiration, which both draws in and emits air. We are led to thinking about the meaning of the term "inspiration" as the initial act of Creation and of "breath" as its expression.

Non-Standard Architectures

If we were to visualize architectures rooted in olfaction, curvilinear, dynamic shapes would almost certainly come to mind. In *Pittura dei suoni, rumori e odori (11 agosto 1913)* [Painting of sounds, noises, and odors (August 11th 1913)] Marinetti wrote: «From the standpoint of form: there are sounds, noises, and odors that are concave or convex, triangular, ellipsoidal, oblong, conical, spherical, spiral, etc.… Whereas sounds, noises, and odors of animals are yellow and blue, those of women are green, light blue, and violet. We do not exaggerate if we state that odors alone are sufficient to create arabesques of form and color within our spirit that provide the motif and justify the need for a painting. If we close ourselves in a dark room (so that we no longer have the use of our sense of sight) with some flowers, some gasoline, or some other odiferous material, our plastic spirit will slowly but surely eliminate the sensations of memory and construct extra-special plastic wholes responding perfectly in terms of nature, weight, and movement to the odors contained in the room. These odors, via an obscure process, have become an environmental power, inciting the state of mind which for us Futurist painters constitutes a pure plastic whole».

They would be figures similar to the moving ones of Oskar Schlemmer, to the action photos of the early experiments in motion pictures, to the Möbius-strip forms and topological exercises conducted by the Ulm school. They would be the twins of the *Spatial Projections* of Antoine Pevsner. They would leave prints like those of Bruno Munari's *The Useless Machines*, the *mobiles* of Alexandre Calder, the works of Alexandre Rodchenko, the extensions of Peter Eisenman, the variations of Bernard Tschumi.

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In 2003 an exhibition titled Architectures nonstandard took place at the Centre Pompidou in Paris. It presented twelve international agencies that use numeric algorithms and calculus to create architectures outside the traditional stereometric canons and made reference to the aforementioned works as formal and conceptual matrixes of this non-stereometric architecture.

The concept of the non-standard emerged from Abraham Robinson's mathematical theories and continued through Henri Poincaré, Gottfried Leibniz, and the theory of infinitesimals that revolutionized the idea of continuum. But its relevance today makes it a suitable candidate for the next phase, which will follow all various post-modernist, neo-modernist, critical regionalist, deconstructivist, and minimalist movements. As a matter of fact, while these movements presented an architecture born from a concept whose purpose *a priori* was the project and its form, non-standard architecture stems from a controlled process whose origin and sequence are known, but whose form cannot be guessed ahead of time. Its ability to make prototypes out of fluid forms, as well as all the tools used in the process, make non-standard shapes something close to the putting into matter of the immaterial and of odors. One might think these forms and their systems of management might as well allow odors to enter architecture much more prominently, granting them new forms of expression within the medium.

Being-Essence

Paul Cézanne believed, in order to emphasize how intrinsic the olfactory dimension was to the experience of places, that a painting should contain the odor of the landscape within it.

The odor of a place, the odor of a building, derives from a combination of natural, iconic, artificial, and human odors which constitute said space. Natural odors are connected to climate, region, orientation, pressure, relative humidity, and air temperature. Iconic odors are those deriving from the materials used, from the typical ingredients of the place. Artificial odors are related to the forced introduction of external odorous elements. Human odors are associated with odors of people, but also with what activities take place within the space, the smell of the clothes people wear there.

In a Fifteenth century alchemical treatise we read «[…] it is necessary to learn to recognize the fineness and coarseness of materials even from their odors […]». In this sense the idea of materials being thought of as

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"dynamic and interactive organisms" feels particularly important – things that are able to absorb, breathe, emit, and thus modify the microclimate of a place or the quality of its air.

Every material has its own odor which depends on a series of factors such as humidity, porosity, temperature, and composition. Perfumer Martin Gras carried out research for years aimed at finding new woody notes. That's why in the Xylotheque squares of wood are arranged like books on shelves. All one has to do is scratch the surface of one of them, even if it is one hundred years old, to smell its scent blooming anew.

If we look into the past, we will see that each culture used to have its own array of odors. The Mesopotamians: cedar, myrtle, and storax. The Egyptians: incense, myrrh, juniper, benzoin, sandalwood, wine, and grapes, and kyphi. The Cretans: laurel, lavender, thyme, and rosemary. The Greeks: iris and yellow amber. The Indians: patchouli, incense, vetiver. The Native Americans: resin, sage.

In addition to the odors released by the materials themselves, odor was incorporated into oils or waxes to embellish and preserve surfaces, as well as mixed into construction mortar as in Babylonian temples and in mosques.

Being is also an essence, and as essence it is olfactory. According to Maurice Merleau-Ponty: «The sensible is simply the medium in which there can be being, without it having to be put there», exactly as with essences in perfume. This statement brings to mind the 2003 retrospective exhibition *Scanning: The Aberrant Architecture of Diller+Scofidio* at the Whitney Museum of American Art. The two architects brought to the exhibition the walls on which celebrated works of art had been hung, with the idea that these fragments of wall were impregnated with the artistic aura of the supported work. One of them was the wall from the Museum of Modern Art on which Marcel Duchamp had exhibited his urinal Fountain for the first-time.

Circuits and Connections

A significant issue with olfaction is the difficulty of expressing sensations through verbal language. According to experts, this lack of vocabulary is generally attributed to one's scarce practice in using this sense. This is only partially true, for today there are numerous systems of classification, but there is no common vocabulary shared among experts.

In the short story about the sense of smell in Italo Calvino's *Under the Jaguar Sun*, the protagonist expresses his difficulty in describing his lover's smell:

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«What I required of Madame Odile›s specific experience was precisely this: to give a name to an olfactory sensation I could neither forget nor hold in my memory without it slowly fading».

But this is not the only reason for the lack of one's ability to recount odors; there are a number of evolutionary factors that need to be examined as well.

The olfactory apparatus is an ancient organ with relatively few direct links to the most recently developed parts of the brain, namely the left neocortex in which our linguistic faculties are located. Instead, it has well developed connections with cerebral structures that are much older in evolutionary terms. These structures – which include the limbic system, the brain stem, and the pituitary body – regulate emotion as well as hormone production. The reptilian brain expresses itself via the language of instinct, the limbic system via emotions and affections, and the neocortex through words and ideas.

Olfactory sensations initially evoke emotions, which are only subsequently translated into cerebral judgments and consequently into conscious behaviors. The qualities of an odor that can be expressed through language and thus can have an effect on architectural design are those of class (floral, citrus, spiced, etc.), temperature, pressure, direction, and spatial distribution.

In spatial terms one must consider the working of our nostrils, which do not breathe the same amount of air at the same time, but rather alternate in cycles lasting some two hours. They are connected via a cross-system to the opposite cerebral hemisphere. The trigeminal nerve is, depending on the chemicals – if they are, for example, carbon dioxide or menthol – activated accordingly.

There are many different theories regarding the inner workings of smell, all of which still to be further explored. They fall into two general categories, one which is molecule-based and the other one is wave-based. The "molecular" theories are built around the shape of the molecule and are known as key-lock theories. This theory harkens back to Lucretius as far back as the first century BC. He believed that pungent odors were associated with atoms shaped like toothed hooks, while sweet smells were smooth and rounded. The idea is that each molecule remains in the nose until it finds a "dock" of the right form.

The "wave" theory was articulated in 1992 as a result of the work of biochemist Luca Turin. It is based on the principle for which each odor corresponds to a specific wavelength, hence to a vibration, and that the nose and the brain function as an "organic spectroscope".

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Words

One of the most significant problems in the olfactory realm is notation, i.e., the system of denomination and classification for working with, and talking about, perfumes and other odors. Various theories and classifications have been put into place over time, seeking to establish a common system for describing and organizing odors. However, there still is no unanimously shared vocabulary of odors. Each perfumery has its own.

These terminological difficulties are also related to the notion that the more terms one has at their disposal, the greater their sensitivity to odors and, consequently, the more developed their capacity to recognize and use them will be. According to Sherlock Holmes in *The Hound of the Baskervilles*, there are seventy-seven scents that an expert detective must be able to recognize. But unless one uses them professionally or studies them for passion, we are commonly able to recognize a much smaller amount. If we seek to determine and describe an odor, we often use terms borrowed from other sensory systems. Many of the words that refer to odors belong to the senses of taste (sour, sweet, rancid, bitter, strong, delicate, good, bad), touch (hot, cold, heavy, fresh), hearing (harmonious, melodious), or sight (clear, vague, dark).

According to Guy Robert, one of the world's major experts in perfumes, when it comes to the development of our olfactory knowledge, we are still stuck in an age comparable to that in which painters didn't have proper names for their colors.They would describe them using words like "blood", "sky", or "snow".

The more commonly used categories specify the following families:

- ethereal, camphoric, musky, minty, pungent, and putrid;
- sweet, acid, austere, greasy, acerbic, fetid (Aristotle);
- aromatic, fragrant, ambrosia, garlicky, goaty, repulsive, and nauseous (Linnaeus's 1756 classification);
- 18 categories including rose and jasmine, balsam, vanilla, camphor, citrus, eugenol, mint (Rimmel, 1800s);
- fragrant (of flowers), putrid, ethereal (of fruit), burnt, spiced (or spicy-hot), resinous (Hennig's 1916 spatial classification);
- floral, balsamic, fruity, empyreumatic, comestible, woody, rustic, repellent (Billot's classification, 1962);
- ethereal, garlicky, acerbic (fruit), rancid (fats), burnt (pyretic), aromatic (spicy-hot), floral (fragrant), woody, musky, nauseating (H. Boelens, 1974).

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That very night, first while awake and then in his sleep, he reviewed the immense ruins of his memories. He analyzed millions and millions of aromatic construction elements and classified them systematically. Quite soon he could begin erecting the first methodical olfactory structures: houses, walls, gardens, towers, cellars, rooms, secret chambers. It was an entire city constructed of the most delicious compositions of aromas. It grew larger and became more beautiful day by day, built to perfection.

Olfactory Material

The notion that a material has its own odor and that this quality can become an architectural element has long seduced many architects. Some of them have approached the odors of materials exactly as a perfumer would.

A talented designer of odorous spaces is Gaetano Pesce, an experimenter with unusual dimensions in architecture and materials. His *Casa di Bahia* – still under construction – stems from that aspiration. It is composed of seven small pavilions made of unusual materials such as rubber. In a 2005 interview for the catalog of his exhibition *The Scent of Materials* at the Milan *Triennale* Pesce said: «I dream of walls waving in the breeze of the sea. I would like them to give off the scent of juniper, one of the most common berries in the area».

In the *Casa di Bahia*, Gaetano Pesce experiments with three plastic materials for the "bricks": urethane, recycled rubber, and natural rubber. In order to eliminate the bad smell of the ammonia used to process the caoutchouc he added juniper syrup to the mixture, the same syrup used to treat colds. Pesce works a great deal with aesthetic concepts that go beyond the visual. He adds that «it is not enough for a furnishing element to be pleasant, well proportioned, or right; it has to succeed in arousing desire. It has to emanate a perfume, make one want to touch it. It has to feel sensorially satisfying. To evoke or suggest thoughts that belong to the least codifiable sphere».

In his book *Parallax*, Steven Holl, who has always approached architectural design also taking these variables into account says: «The smell of rain-wet dirt, the texture merged with the color and the fragrance of orange rinds, and the steel-iced fusion of cold and hard: these shape the haptic realm. The essences of material, smell, texture, temperature, and touch vitalize everyday experience».

In thinking about the relationship to these materials we certainly have to consider the changes that have taken place over the past decade when

it comes to architecture's notion of its own durability. In these buildings, which appear specifically designed to last for less time, materials that are more experimental in nature – that the architecture of permanence has yet to consider – are introduced. This explains the presence of certain materials like paper in the works of Shigeru Ban, or the curtains in the works of Petra Blaisse, etc.

Compositions

Creating with odors is a bit like writing a text.

Looking back at what we have spoken about so far, there are "top notes" – we may also call them "facade notes" –, which are the ones that first seduce one's nose and remain more strongly impressed in one's memory to be immediately recognized. Then come "body notes", which are the central parts of smell – they give smell structure and, similarly to a building, they support it. Lastly, we have the "bottom notes", which have a fixative function and deal with the duration of the scent as if they were finishes which give an overall sense of quality and warmth to the whole.

The different components that emerge over the time span of a perfume bring different weights and contributions to the whole expressing through their composition the dynamism of the feeling one seeks to express through perfume – from the more volatile and evanescent top notes to the animal and resinous bottom ones. This syntactic structure explains why literature is often associated with perfumes – or better, why the literature of any given period evokes a particular perfume or array of scents following the prevailing style of the period. Baudelaire's poetry brings the atmosphere of the brothel into the domestic setting alongside with the time's passion for heavy perfumes. Émile Zola used to associate the more intellectual and aesthetic senses (sight, hearing) to the more instinctual and erotic ones (touch, smell). Huysmans gave his protagonist Des Esseintes olfactory hallucinations of red jasmine associated with the times of Louis XV.

Is there a similar relationship between odor and architecture?

One of the most important noses of all time, Edmond Roudnitska, believed that the creation of a perfume was in itself a sort of architecture with its foundations, its upward development, and its topping. And like in architecture, there are static, syntactic, structural, and stylistic rules.

The notion of style brings to mind just how olfactory the Baroque was in its intention to compose not just forms, but sensations, movements of air and odors within its curvilinear spaces. How could we not mention the airy spirals joining the floors of Lorenzo Borromini's *Casa*

dei Filippini [Filippini's House]? Baroque culture placed the question of perception at the heart of its research, somewhat disregarding the canon of symmetry and perfection in favor of an exploration of the potential of a long, continuous narrative. Reading Paolo Portoghesi's writings on the Baroque regarding how the curves of Sant'Agnese and San Carlino open up directly into the urban space, how their power engages the surrounding space becoming an open fragment of a continuous oscillation, a point in which the true nature of space as mobility and becoming is revealed, we cannot help thinking of the flows of odors tracing out the same spirals and the same spaces.

Another synthesis between architecture and smell took place during the shift from artisanship to industrial production, at the dawn of the Twentieth century, through the utopia of the *Gesamtkunstwerk*, the total work of art promoted by the national-regional movements Nieuwe Kunst, Liberty, Jugendstil, and Art Nouveau. Here, design was meant to bring together all forms of experience, including the olfactory dimension, which was to be incorporated into architecture through the fabrics and wallpapers that covered the interiors. Where olfactory seduction was not directly allowed, it would be evoked through formal, decorative means, as in the triumphant bronze laurels on the dome of Joseph Maria Olbrich's Vienna Secession building (1897-1898). The concept of "total work of art" entailed that everything, down to the very last detail and encompassing all the senses, be part of the same aesthetic plan. In 1895 Henry Van de Velde, for his own house in Uccle, even went as far as to design his wife's dressing gown.

In this scenario we should also mention the works of Antonio Gaudì who achieved a type of extreme fluidity which had only been explored in the Baroque. He created soft interior spaces without sharp corners or edges, fluid spaces for the circulation of air. When he was young, Gaudì had studied the paths and caves that led to the holy site of Montserrat and must have been impressed by the odor of moist soil that filled up the underground spaces moving in fluid lines, alien to right angles.

The shapes of his Parc Güell in Barcelona, built between 1900-1914, hence feel like a culmination of that process.

William J.R. Curtis in *Modern Architecture Since 1900* talks about the park referring to nightmarish underground caves, hints of shadowy clearings in some forest hidden in the bowels of the earth, and steps that flow like lava. The main terrace is supported by a hypostyle hall held up by hollow cement columns, through which the drainage channels run.

It was right around Gaudì's time that Cubism was born. With its fusion of abstraction and fragments of reality, it paved the way for a new relation-

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ship between spaces and ideas, between tangible materials and their invisible dimensions that proved capable of overturning the canonical forms and shaping new ones.

Vernacular, Tribal, Hypogeal

So-called vernacular architecture has a strong link to the olfactory dimension for a series of obvious reasons, one of them being that it is strongly immersed in nature and its surrounding environment, whose matter it usually turns into construction materials.

- *Igloos* whose odor is associated with steatite lamps used to heat them, to the animal skins that cover their interiors, and to ice.
- The *teepees* of the native Americans steeped in the smoke of the central fire and covered with animal skins.
- The *yurta* of Central Asia covered with wool from the shepherd's flock.
- The *kraal* of the Masai made of bent branches covered with dung, clay, and plant materials.
- The Laplander *goatte* made in wool, fabric, and reindeer skin with a birch-branch floor.
- The *adobe* structures made of unburned clay and brushwood.
- The *torchis* in northern Cameroon that are granaries in the form of enormous clay jars.
- The walls of the houses in Burkina-Faso stuccoed with a mixture of dirt and oil.
- The Dogon and Yemenite dwellings made of sand and earth, clustered together for thermal as well as structural reasons.
- The Mexican *pueblos* and their odor of rock.
- The *fairy chimneys* in Cappadocia with their odor of tuff.

Memory

Anyone who gets involved with olfaction will sooner or later find themself reading about Marcel Proust's renowned pastry *madeleine* in his book *A la recherche des temps perdu* [In Search of Lost Time] The pastry brings back to the protagonist's mind something that he had forgotten. While eating a piece of *madeleine* dipped in tea, he experiences an extraordinary sensation. He is filled up with a delicious feeling of pleasure which seems to come out of nowhere. Making him suddenly indifferent

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to the vicissitudes of his life and its illusory brevity the same way love might do, it fills him with a "precious essence". He feels as if the essence were not *in* him, but as if he himself were it. He ceases feeling mediocre, contingent, mortal. He has no idea where this violent joy is coming from, but he senses it being somewhat related to the flavor of the tea and the pastry, yet stretching far beyond it.

The sense of smell acts without forewarning; the recipient has no chance to protect themself from it. Olfaction does not require some password to access lived emotions. Olfactory images, as opposed to visual ones, do not age. They remain intact through time and resurface decades later with the same freshness as on the first day.

Human and animal memory in general is made up of an *episodic* component and a *semantic* component. *Episodic* memory relates to the recollection of experienced events. *Semantic* memory, on the other hand, is the ability to recognize various phenomena and objects that are named through language. In the sense of smell both mnemonic processes participate, albeit in different ways. To smell an odor does not necessarily mean being able to name it. But, when olfactory information is recorded in both registers – perceptive and linguistic – then it is indelible, as also stated by the Dual Coding theory.

There is a work by Clino Trini Castelli, Frazer McKimm, and Karin Schneewind titled *Osmic Gate which was specifically* designed on the basis of dual coding. It is composed of a door and a path which stand as the entryway to a Cambridge golf club. The idea is to contaminate a place dedicated to the golfing elite with an odorous icon harkening back to the dawn of the industrial revolution, in the very country in which said icon first came to life. The pathway was carved in Norwegian pinewood, cut to the standard size of railway ties and soaked in creosote –a moth-proof impregnating agent, as well as the railroad's most iconic odor from back when the ties were made of wood. In *Osmic Gate* the value of the olfactory element had to be both respectful of tradition and perceived as innovative.

Since odor is identity in biological terms – as well as in semantic and symbolic terms – we identify, memorize, and recognize places, people, and emotional events through our sense of smell. Think of Al Pacino as a blind and depressed veteran soldier in *Scent of a Woman* when he dances the tango with Gabrielle Anwar after recognizing her smell. Or of Robert Duvall as Lieutenant Kilgore in *Apocalypse Now* when he perceives the disturbing odor of napalm as the smell of victory, or even Andy Warhol, whose favorite smell was the lobby of the Paramount Theater on Broadway.

Mediterranean

The Mediterranean Sea isn't, by its nature, inherently a border separating peoples – it is however being turned into one following a specific political agenda. Multiplicity, a collective of designers, called the Mediterranean a "solid sea" during a 2002 exhibition at Triennale in Milan titled USE (Uncertain State of Europe). The solidity of this sea is reinforced by millenary bonds filled with mythology, religion, wars, trades, stories, flavors, sounds, and certainly odors as well.

In a Studio Azzurro work on the Mediterranean created in collaboration with Hermès, this concept is expressed through wind – *anemos* – that brings life to an arid land. Wind shapes the landscape, it clears it. It scatters pollen and spores. It arranges bushes and transports trees, watering them with the southern heat. Wind moves water and sand. It carries from one coast to another the codes of a DNA that is shared across the Mediterranean. Winds are what carries the scents of Mediterranean vegetation, of myrtle, rosemary, lentisk, and jasmine – so much so that one can smell land even before being able to see it, similarly to how one from the land can smell the sea, scents as varied as the shapes the wind draws on it.

That Mediterranean architectures are references to boats was once observed by Le Corbusier, but that the boats sailing out on the Mediterranean are themselves architectures was first analyzed by Predrag Matvejevic in *Mediterranean: A Cultural Landscape*. He writes that it was easy to figure out the location and type of the shipyard by the odor of the tar used on the boat, and that the construction of even the simplest boats is inconceivable without the use of tar. Tar – the kind extracted from plants, not the mineral tar used to make roads – is made from old pine or spruce wood that no longer leaks sap when cut. The trunk was left to cook or smolder until all that was left was a thick, dark substance, which was then cleaned of any remaining impurities. Tar prevents the wooden planks from fermenting like wine when exposed to warmth or moisture, it protects them against rot and seals the cavities. It is also used on ropes, especially thick ones, and on barrel staves. Sometimes tallow or wax is added to it to make it easier to work with. It hardens easily and then has to be melted. It is heated over a flame and applied to the planking and between the ribs of the keel along with oakum as if it were a medicine. It makes a strong and odorous flame when it melts and leaves a dry, lightweight coal when completely burned. Tar was used as a skin ointment and also to treat gout and certain other maladies that sailors contracted in Mediterranean ports.

Scents seeking to evoke the Mediterranean are as numerous as the poems, stories, movies, and songs dedicated to it. Each one aspires

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to capture the smell of sea breeze, of citrus garden, or a fragment of olive-green vegetation. We will never cease adding ingredients to the Mediterranean for it is an evolving story that will not be confined. We can write nothing more poetic or complete than what has already been written about the Mediterranean. It is a vast and extraordinary literature that calls for endless quotations.

City Odors

Each place contains an idiosyncratic array of odors that belong to it depending on the season, the time, and its history.

In Oliver Sacks' book *The Man Who Mistook His Wife for a Hat* the author states: «You smell people, you smell books, you smell the city, you smell the spring».

Cities have odors, not merely in the sense of metropolitan-type smells or pollution-related ones, but in the proper sense of an olfactory essence, of an identity that at times only a few are able to recognize. Some cities smell of curry, port cities of brine mixed with rust, other cities smell musty and stale, and there are those pervaded by the acrid odor of burned wires. Perhaps this is the reason why there are so many perfumes bearing the names of cities or places: *Paris*, *Un Jardin en Mediterrané*, *Un Jardin sur le Nil*, *Jaipur*, *Roma*, *24 Faubourg…*

Once again Grenouille, the protagonist of *Perfume* by Patrick Süskind, finds himself at a certain point in *the world's largest olfactory area: Paris.*

«It was a mixture of human and animal smells, of water and stone and ashes and leather, of soap and fresh-baked bread and eggs boiled in vinegar, of noodles and smoothly polished brass, of sage and ale and tears, of grease and soggy straw and dry straw. Thousands upon thousands of odors formed an invisible gruel that filled the street ravines, only seldom evaporating above the rooftops and never from the ground below».

Paul Valery wrote about the port-side arcaded walkways of Genoa, emphasizing their hybrid, multiethnic, Arabic flavor and their concentrated odors, odors of frozen things, of spices, cheeses, roasted coffee, and the delicious bitter aroma of finely burned cocoa.

New York is associated with the smells of street vendors with their overly grilled hot dogs and salted pretzels. The Laurice Rahmé perfumery has developed New York-inspired scents, each evoking specific essences of specific parts of town: *downtown*, *midtown*, or *uptown*.

A city that has a deep bond with water and its effluvia is Venice. Alberto Savinio wrote in *Ascolto il tuo cuore, città* [I listen to your heart,

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city]: «Venice is hiding this evening, but I recognize it by its odor. Odor: spirit of the mortal part of people, things, cities. Ferrara is the sister in odor of Munich. Both smell like burned stumps […] The water of Venice has its 'own' odor […] You can love Venice for its odor more than for any other reason it may have for being loved».

Open 24 Hours

Geographer Luc Gwiazdzinski, who studied the nocturnal cycles of the city, wrote that our cities have an odor that accompanies both our daily and nightly activities through the different seasons. We usually forget said odor, but sometimes, without warning, it reappears leaving us disoriented. Evoking the odor of a city means describing a place of life characterized by ceaseless movement, by uncontrollable and necessary closeness, where the individual attempts to gain some personalized, intimate space.

In Gwiazdzinski's book *La Ville 24 hours sur 24* there is an interview with Céline Ellena – a perfumer of the Ellena family, who boasts several generations of renowned noses and perfumers – about the iconic nature of certain odors connected to places. «La Défense has a particular olfactory fingerprint. It is a bit mineral and neutral, proper of a place dedicated to the tertiary sector. If, on the other hand, one strolls down the Barbès neighborhood, a cosmopolitan area, and goes into the Tati department store, their nose will certainly be surprised by the strong odors of spices and aromatic colonies coming from the African stores… That odor reassures a group of individuals who thus find some cultural continuity in space and time. Whether they are in good shape or damaged, unsettling or reassuring, this neighborhood identity card represents the intimate and continuous city that stirs our emotions». But the city also has its own rhythms and may change over the course of a day. Therefore, beyond its identity, it has to deal with activities, seasons, and other factors that affect the nature of its odors. In the morning Paris has the fresh smell of water along the edges of the streets, of newly applied aftershave, of croissants in the metro. But in the evening, everything changes.

A place almost never has the same odors during the day and during the night because the temperature, the people, and the activities all change. Nevertheless, cities that are open 24 hours a day are characterized by an eternal odor that is every bit as unsettling as the rabbit's watch in *Alice in Wonderland* that always reads the same hour. They are places of constant emotion, of perennial control… from which to escape. Smells, like natural light, are vectors resulting from a series of variables difficult to control

entirely. The 24-hour city should not fake an eternal day but follow and respond to the rhythms and qualities of every hour of the day and night.

One of the world's most famous perfumes, *L'Heure Bleue* by Guerlain, was conceived one summer evening «in 1912 when Jacques Guerlain, on his way home, stopped on a bridge over the Seine right at that moment when the sky loses the sun, but no stars have yet appeared, and all the elements of nature are suffused with a blue light. It was a true homage to the Impressionists, who Guerlain dearly loved», writes Mariangela Rossi in her *Libro del Profumo* [Book of Perfume].

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5. Bodies and Distances

Territory and Belonging

Our olfactory territory is an extension of our bodies. We colonize the space around us similarly to the way other animals mark their territory.

Smell is the first sense we use to explore the world. It appears that the first sensory perception one has, before one is even born, is an odor perceived in the amniotic fluid. Actually some even say that the spermatozoa themselves bring their own odor to the egg. Therefore, the mother's odor can already be smelled in the placenta, when it is still functioning somewhat amphibiously; the fetus smells the close presence of she who nourishes and protects it, of its primary home.

This is more explicit in the animal world: the bond between parent and young is initially olfactory in nature. This odor stays ingrained in the memory as an indelible trace. We see this manifested in salmon and their spectacular migrations back to their home streams. They seem to memorize, in their embryonic stage, the odor of the pool where they were deposited as eggs. And they are guided back to it by their sense of smell, by a form of underwater olfactory orientation.

In his book *Odori* [Odors], Gianni De Martino's dwells on the spatial issues of olfaction: «Placed between the senses of distance (sight and hearing) and those of contact (touch and taste), the sense of smell has been considered a primitive, animal, instinctual, voluptuous, erotic, egoistic, impertinent, libertine, frivolous, and asocial sense, one that goes against our free will (since it forces us, whether we want it or not, to confront unpleasant sensations) and is incapable of getting beyond the primal solipsism of subjectivity».

In this sense olfaction occupies the intermediate area of proximity, social relations, distance, proxemics, and habitation. The social history of

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odors is that of our way of relating to others, to their bodies, to their eating habits, to their rites, and to their scents.

Take for example social crusades against passive smoking. Smokers occupy the airspace of non-smokers, somewhat imposing their olfactory space on others. Similarly, someone who wears a strong perfume may be trespassing the space of others. Years ago, in Halifax a ban was instituted against "perfume abuse" in order to prevent disturbance to others.

The question of body odor is very complex for it depends on many factors, including diet. For this reason, and in spite of the fact that we live in the era of globalized consumption, our odors differ greatly from one person to the next. Among consumers of butter, animal fats, soy, and curry there is quite a variegated olfactory panorama – one that we hope will endure.

The Trigeminus and the Olfactory Compass

The olfactory organ does not have a monopoly on odors. Two other organs are also involved in the perception of odors: the trigeminal nerve (or trigeminus), and the vomer-nasal organ, while direction and orientation are linked to two other factors: the moist nose and the olfactory compass.

A moist nose is key, for in the presence of water molecules will dissolve more easily allowing one to locate the wind's direction and better capture the odors in the air.

The nose is a sort of compass for in the ethmoid bone near the nasal bridge, lies a small quantity of iron. In humans it is in very small amounts, whereas in animals such as dolphins, tuna fish, salmon, carrier pigeons, and bees it is found in much higher quantities and seems to play a role similar to that of a compass needle in response to the earth's magnetic field.

In addition to the horizontal plane, the olfactory apparatus is also affected by gravity. Astronauts, for example, lose their senses of taste and hearing in a weightless environment due to the nasal congestion resulting from increased pressure in the capillaries, which, like the heart, normally have to work against the force of gravity.

Furthermore, olfaction also provides us with a very significant perception of height for the highest concentration of odors is found just above ground level, and odors tend to dissipate quickly higher up in the air.

For the smell of a substance to be perceived, molecules from the substance have to dissolve in an aqueous solution that our mucous membrane is able to absorb. The incessant flow of mucus is renewed every

twenty minutes and works like a sort of conveyor belt, capturing odor molecules and engulfing dust, bacteria, and other particles.

The trigeminus allows us to perceive, for example, pungent odors such as ammonia. It is usually triggered at high odor concentrations by odors where the olfactory apparatus can be, despite the large quantity of odor molecules, overwhelmed and basically ceasing to perceive an odor perception. The sensation of odor is thus in part related to the stimulation of the trigeminus. This happens in the case of ammonia, for example, when along with the acrid odor one has a prickling sensation in their nose. The fortunes of a beverage like Coca Cola have much to do with the pleasure deriving from stimulation of the trigeminus. The same is true for some spicy foods and spiced perfumes. One characteristic of this organ is its tendency towards "dependency", initial aversion may eventually turn into pleasure. This is the case with cocaine, tobacco smoke, pepper, mustard, curry, ginger, horseradish, and vinegar, which are all substances that strongly stimulate the trigeminus.

According to the famous *nez* Guy Robert: «There are not good or bad noses, only people interested in odors and others who pay little attention to them. Each of us has a perfect nose. The best that I have encountered? Children between the ages of eight and twelve, whose brains are not yet sullied and do not know what they are smelling ahead of time».

Animality

In *Under the Jaguar Sun*, a book of stories dedicated to the senses, Italo Calvino defines our olfactory animal condition through the nose: «And wasn't it, after all, the same thing in the savannah, the forest, the swamp, when they were a network of smells, and we ran along, heads down, never losing contact with the ground, using hands and noses to help us find the trail? We understood whatever there was to understand through our noses rather than through our eyes: the mammoth, the porcupine, onion, drought, rain are first smells which become distinct from other smells; food, non-food; our cave, the enemy›s cave; danger-everything is first perceived by the nose, everything is in the nose, the world is the nose. In our herd, our nose tells us who belongs to the herd and who doesn't; the herd's females have a smell that is the herd's smell, but each female has an odor that distinguishes her from the other females… Odor, that's what each of us has that's different from the others. The odor tells you immediately and certainly what you need to know. There are no words, there is no information more precise than what the nose receives».

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The sense of smell is the strangest of our senses for it is both animal-like and highly sophisticated. From Aristotle all the way to Kant olfaction was continuously downgraded aesthetically to the point where physiologists ended up considering the nose to be a mere evolutionary relic.

In the animal world the sense of smell is used to detect enemies and may even be implicated in defensive strategies, such as in the case of skunks. Animals that live close to the ground have a more acute sense of smell than birds, which are almost all anosmatic, except for pigeons.

There is a distinction in the animal world between microsmatic and macrosmatic animals. The former have a well-developed olfactory system and most have a moist nose which allows them to sense wind direction and thus locate the source of odors. Macrosmatics live relatively close to the ground because that is where odors are mostly concentrated and because odorous substances are mainly transported in a horizontal direction or attached to objects.

The sense of smell is absolutely vital for most mammals. They depend on it to find food, to escape predators, and to choose mates. Sexual odors serve to attract the opposite sex as well as to mark territory.

There are numerous stories about animal behaviors related to the sense of smell. They all emphasize on how many of our olfactory behaviors are still strongly linked to our animal instincts, especially regarding sex, war, and power. For example, the panther, a scented animal, uses its scent to hunt, to "seduce" the prey, just as it occurs with people, in a more veiled or more explicit way. Our sense of smell is often used in war, for example, to locate war machines or the enemy, as in the Vietnam war.

Pet me

Some animals have always lived around people. In some ways they were the original source of heating for people and their dwellings. The presence of these animals was certainly associated with an odor that pervaded the area. However, it was probably not specifically noted but considered an integral part of a domestic landscape that had not yet been influenced by modern notions of hygiene.

Imagine the concentration of odors on Noah's Ark: all the animals in pairs enclosed together in the same hold for days and days. The quest for survival and the risk of sinking likely made the odors more tolerable.

The presence of animals within our architectural structures has varied over the ages. At first, they would share our space, then they were put in special stalls, then some of them – cats and dogs and some others – came

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back inside along with exotic animals collected on expeditions (odorous whether alive or dead). They were pushed outside again. Now they have come back in to share living spaces with us.

Stables for livestock have been an integral part of all of architecture's most significant transformations. Think of Hugo Haring's cowshed (1925) at Gut Garkau, near Lubeck, which was a rational and modernist model for animal architecture. The center of the shed was a fodder bin for a bull and forty-one milk cows. The hayloft was situated above this area so that hay could be directly supplied to the feed bin through a trapdoor. The roof sloped slightly inwards to achieve optimal ventilation: the rising warm air was conveyed towards the exterior wall, where it escaped through a continuous grill at the top of the wall and under the roof.

Or think of the famous San Cristóbal horse-raising farm built by Luis Barragán and Andrés Casillas in 1967 for the Egerstrom family in Los Clubes, Mexico, with the stables clustered around a pond fed by a powerful water fountain.

Outside domestic settings, the urban dwelling places for animals are circuses and zoos, where animals are displayed in a spectacular environment. Their odors being perhaps the only remaining element of their true natures. There are some memorable structures at the London Zoo, including the Penguin Pool with its ultra-thin reinforced concrete ramps and the Gorilla House created by Berthold Lubetkin and Tecton in 1934, and Cedric Price's Aviary (1960-1963) with its aluminum frame and tensioned steel cables creating a lightweight and airy structure that provides maximum flying space for the birds.

Sports

Sports are performed in places filled with sweat, transpiration, and the tension of competition. The odor of the gymnasium is an everyday olfactory icon relating to the oxygen uptake and gaseous exchange of active, sweating bodies.

The Maravillas College Gymnasium in Madrid designed by Alejandro de la Sota (1961) and constructed in a building with one side against the earth features an interesting play of air and sunlight on the front. Air is drawn in through a grill at the bottom of the wall, and later expelled through vents at the top of the opposite wall.

The Salle Omnisports by Décosterd and Rahm is particularly interesting for it incorporates the athletes' sweat into a broader ecosystem. This is how it works: heat is produced by a convective solar heating system that

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heats compacted soil from the building's foundation excavations which thereby acts as a heat accumulator. The heat is then channeled into the gym and heat and oxygen are absorbed by the sweating players, who give off carbon dioxide and water vapor which condenses on the glass walls. The plants located between the double-glass walls absorb the carbon dioxide from the air as well as the condensed water with mineral salts. By means of chlorophyll-mediated photosynthesis the plants transform the sun's energy into nutritional substances and produce the oxygen necessary for metabolizing food and providing energy to the players.

It might be amusing to think of a similar system for the heavyweight "Rumble in the Jungle" between Mohammed Ali and George Foreman in Kinshasa, Zaire in 1974. Imagine the energy, imagine the power generated! What an ecosystem!

Swimming pools, realm of chlorine and hygiene, are also linked with odors. And it is perhaps this sense of cleanliness and health that inspired the Beijing Water Cube which housed the pools for the 2008 Olympics and explicitly evoked the shape of the water droplets trapped in the structure. The architects of the PTW National Swimming Centre assisted by London's Studio Ove Arup designed an envelope which mimicked the sensation of surface tension typical of soap bubbles.

In automobile racing we have the odor of rubber and gasoline, oil and rubber that burns the asphalt. It is a unique, pungent odor that, together with the sounds, conveys a strong sensation of the race even when cars are hidden on the other side of the track.

Attraction and Repulsion

Odors play a fundamental role in attraction and repulsion. We are inexorably attracted by a pleasant odor even if we do not know where it comes from, while we are repulsed by unpleasant ones even if we do know what they are.

Civetone ($C_{17}H_{30}O$) and muscone ($C_{15}H_{28}O$) are the two major ingredients when it comes to determining our feelings of attraction or of repulsion towards smell. They both derive from civet and musk, which are of animal origin, somewhat confirming the strange contradiction that we are repulsed by our own odor because we consider it to be too "animal", while also using ingredients in our perfumes that come precisely from that realm.

Among perfumes, musk is the closest to natural body odors. Natural musk is a secretion stemming from a sort of abdominal gland located between the back legs of male musk deers – they live in China, eastern

Tibet, and Siberia. Civet on the other hand derives from a secretion of the homonym civet cat. Ambergris is formed in the intestines of sperm whales. Castor comes from beavers.

Mechanisms of attraction and repulsion are very complex ones, and it is the ambition of entire industries to unravel them.

Oscar Wilde wrote in *The Picture of Dorian Gray*: «He […] set himself to discover their true relations, wondering what there was in frankincense that made one mystical, and in ambergris that stirred one's passions, and in violets that woke the memory of dead romances, and in musk that troubled the brain, and in champak that stained the imagination».

The relationship is certainly not so direct, not so cause-and-effect as he puts it. Nevertheless, scientific and commercial experiments are carried out all over the world playing around with the attractive power of odors. In London an experiment with 5-Alpha-androsterone was conducted It is a human steroid secreted in the sweat and urine of males, which resembles certain components of the molecules that convey the odor of sandalwood, which is often considered to be a sort of aphrodisiac. This steroid was sprayed on several unreserved seats in a theater. Researchers observed that women would unknowingly go for the seats impregnated with that odor rather than for the others.

Another delightful anecdote is provided by Diane Ackermann in her book *Natural History of the Senses*. She recounts that many fashionable Manhattan women wear a perfume called *Pheromone* which costs thirty dollars per ounce. Stemming from scientific research on the substances emanated by animals to stimulate sexual attraction, the implied promise is that the perfume will grant women a somewhat alluring smell which will turn adamant men into slaves of desire. What's strange about said perfume though, is that the producer did not specify which pheromone was used to make it. Scientists have not yet identified human pheromones, but they have isolated those of the boar. Ackermann was amused by the idea of a generation of young women walking about the streets of New York impregnated with pig hormones and especially tickled by the idea of what would happen if a bunch of sows were set lose all over Park Avenue.

Seduction

Odor is an indispensable instrument in seduction, which is governed by the extraordinary alchemy between the likes and dislikes which draw us to certain people and places rather than to others. There are numberless historical and legendary tales about the strategic role played by perfume

in seducing a person and changing the course of history. The queen of Lemnos, Caterina de' Medici, Isabella d'Este, Alexander the Great, Napoleon, and a long list of eminent figures have had a special relationship with odors. But Cleopatra is perhaps the most distinguished of all of them.

Of Plutarch's many tales of the Egyptian queen, perhaps the most fascinating is the one about how she succeeded in seducing Mark Antony by sailing to him in a barge whose sails were impregnated with rosewater: «She came sailing up the river Cydnus, in a barge with gilded stern and outspread sails of purple, while oars of silver beat time to the music of flutes and fifes and harps. She herself lay all alone under a canopy of cloth of gold, dressed as Venus in a picture, and beautiful young boys, like painted Cupids, stood on each side to fan her. Her maids were dressed like sea nymphs and graces, some steering at the rudder, some working at the ropes. The perfumes diffused themselves from the vessel to the shore, which was covered with multitudes, part following the galley up the river on either bank, part running out of the city to see the sight. The marketplace was quite emptied, and Antony at last was left alone sitting upon the tribunal».

Seduction is a powerful drive of creativity and desire. It is difficult to understand why architecture refers to the body only either as a metaphor or as a formal – or even anthropomorphic – reference, without instead capturing the more emotional and seductive dimension that bodies and places are capable of evoking. Rarely has architecture been inspired by the emotional force that a body is capable of arousing, by emotional attraction, or by the seductive capacity of the inanimate.

There was no seduction in Modernism, its nudes were uncensored, lacking any coyness. Think of the transparent glass of Mies van der Rohe's Farnsworth house in Plano (1946-51), or Philip Johnson's Glass House in New Canaan (1949). The body is revealed in its wholeness and total nudity. Consider, on the other hand, the seductive power of Shigeru Ban's Curtain Wall House in Tokyo (1995), with a corner covered by a single wind-fluttered curtain that moves to allow glimpses, to briefly make out what is going on inside while never showing everything.

Sexuality

The sense of smell is not a panoramic sense, it is not a sense of distance; it is a tool of nearness, of intimacy and physical presence. For this reason, together with touch and taste, it is one of the erotic senses.

A body, in addition to being a receptor of odors, also emanates them. This dual direction, this reciprocity, is one of the more common triggers of

the rituals of sex, and of recognition and attraction. The disappearance of bodily odors, replaced by others designed for their deodorizing effect, has in some way extinguished or banished certain iconic odors associated with love sites and aroused bodies. In a 1975 article in the magazine *Casabella*, Andrea Branzi wrote that «[…] sex conditions the spatial experience, i.e., it conditions the capacity to conceive of the empty space that exists between us and others, a space that is normally understood as architectural space, as a sexual medium, as a place of free exchange of messages and relations or sexual experiences. This sort of hypothesis, sufficiently elementary to be true, is officially lacking in the history of architecture».

The places of erotic passion have always had their associated odors. They were initially physiological and beastly, and later became characterized by increasingly sophisticated ingredients for the staging of pleasure. Here Catullus is an inexhaustible source of metaphors and anecdotes that are full of olfactory references such as in the satire against Rufo to whom he writes: «Wonder not, Rufus, why none of the opposite sex wishes to place her dainty thighs beneath you, not even if you undermine her virtue with gifts of choice silk or the enticement of a pellucid gem. You are being hurt by an ugly rumor which asserts that beneath your armpits dwells a ferocious goat. This they fear, and no wonder; for it's a right rank beast that no pretty girl will go to bed with. So, either get rid of this painful affront to the nostrils or cease to wonder why the ladies flee».

Over the centuries the odor of bedrooms has become increasingly sophisticated and ritualized and less natural and animal. We see this in Casanova's stories where washing the woman's body in rosewater has a merely aesthetic value, in Sade's eroticism which denies odor, or in the idiosyncrasies of Alberto Savinio towards a city whose foul odor he likens to "the genital reek of a detestable woman".

There are only rare cases of refined places of sex such as the *boudoirs* that the Turinese architect Carlo Mollino designed in 1938-40 for himself and his friend Devalle so they could go there with lady friends and take photos. The materials used in these interiors are glass, mirrors, aluminum, lots of curved wood, stuffing, and fabrics that unite eclecticism and personal rigor in a singularly erotic and sensual atmosphere: reflections, velvet, bodies…

Anthropology

The sense of smell has a strong social value for its capacity to foster relationships among people, and a strong anthropological value for its capacity to serve as an observatory on human behavior regarding their

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own odor and those of others. Tribal, animal, and social odors all share the same mandate: that of identifying and recognizing members of the same tribe, corporation, or pack, and deciding who is similar and has "family" rights, and who is to be marginalized.

Distances between bodies are also regulated by olfactory assessments that vary from one culture to the other. For example, in European culture proximity to someone's odor is thought of as tolerable or not in relation to the degree of intimacy between the source of said odor and its receptor, whereas in another culture those same conditions of proximity may be tolerated without any problems.

In 1890 Rother described the ways in which the Khyoungtha hill dwellers in India greeted each other: «They have a strange way of kissing each other; instead of pressing their lips together, they apply their mouth and nose to the cheek and inhale strongly. In their language they don't say 'give me a kiss', they say 'smell me».

Odors also condition the ergonomics and the positions of bodies in accordance with the spaces they inhabit and vice versa. Think of the different ways of sitting between Eastern and Western people, the former often sitting on the floor and the latter usually sitting on chairs. Think of how the perception of the air and the odors it carries varies depending on perceptive height. At a few dozen centimeters above the ground the eastern person will have a relationship with odors that the western seated with their nose one meter above the ground will not have. The former will find themself immersed in the heavy odors that tend to move horizontally, parallel to the ground. They will smell the odor of the *tatami* mat, or of a carpet on which people walk barefoot. The latter will on the other end enjoy a warmer temperature and a desaturated air which will surely be, though, free of any specific olfactory ingredients.

George Orwell

In a renowned book by William I. Miller titled *Anatomy of Disgust* there is a reference to the sense of smell in George Orwell, not only in his texts, but also in his personal life. According to Miller, Orwell (as well as Jonathan Swift) – and not the various authors such as Jean Genet and George Bataille who wrote self-indulgent pieces about pornography, sadism, and sexuality – was the Twentieth century's true poet of disgust. Throughout his life Orwell was incessantly tormented by ugly and malodorous things, perhaps more as a genuine sense of disgust rather than a moral sentiment. He believed that real disgust, the repugnance of

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unwashed bodies, bodies that live promiscuously, that stink, or at least smell differently from us, was the major obstacle to the success of Socialism. According to Orwell, a foul odor was an insuperable barrier. In a way, if one considers the significant differences in terms of hygiene and diet between the middle and the working class in the early 1900s, it would be hard for one not to understand Orwell's difficulty in accepting a socialism based on the principles of an across-the-board equality. He felt that racism, religious differences, differences in education, temperament, intellect, and even differences in moral codes could be overcome. But physical repugnance could not. He felt it was possible to feel something for a murderer or a sodomite, but not for a man who always reeked of foul breath.

Orwell's analyses were quickly dismissed as ingenuous, but what counts is that they are based on a great truth: there lies a connection between emotions and cultural, racial, and social differences. Olfactory discrimination is inscribed into the history of humanity and our experience of places. Think of the institution of the class system in transportation, on trains, planes, or boats. Imagine what the conditions must have been like in the hold of a transatlantic liner headed to America in the early 1900s.

Orwell very well knew that the odor of the norm was partially defined by that of those at the bottom of the social ladder, while at the same time it was completely independent from one's own natural odor. For this reason, he was torn his entire life between his elitist background on the one hand and his socialist leanings on the other.

Orwell's olfactory tastes conditioned his very identity. He knew it was easy for him to declare that he wanted to get rid of class distinctions, but he also knew that everything he thought or did was the result of those very differences. His notions – of good and of evil, of the pleasant and the unpleasant, of what was amusing and what serious, of beauty and ugliness – were all essentially *petit bourgeois* notions. In order to overcome his class orientation, he felt he had to suppress both his elitism and almost all of his likes and prejudices. He would have to alter himself so completely that he wouldn't be able to recognise himself anymore.

In the late Nineteenth century Somerset Maugham also reflected on the role of bodily odors in democracy. He described a scene in which a high-ranking Chinese official sat down after dinner to speak to the most tormented of slaves as equals, man to man, in a way that was very rare in the West. Maugham writes that the Chinese people live their entire lives close to very unpleasant odors but that they do not notice them. Their nostrils are inured to odors that would drive away a European,

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and so they can be amongst farmers, slaves, or craftsmen. He felt that the invention of "sanitary convenience" destroyed the feeling of equality among men – according to him it had a bigger effect in the enmity between classes than the monopoly of capital in the hands of the few did. Maugham states it is tragic to think that the first man who flushed the toilet with a simple and negligent gesture sounded the death knell of democracy.

Yard Time

During the long months spent in her hiding place in Amsterdam, Anne Frank often crouched under the window to smell the fresh air that came in through a crack. It was one sublimated moment of freedom the young girl could allow herself.

Yard time is, quite aptly, the only chance granted to prison inmates to get out of their cells and move around in a larger space, perhaps in the open air. In an enclosed world of limited mobility, forced proximity, and olfactory harshness, it is somewhat amusing to think of the Marquis de Sade insisting in his letters from his prison cell in the Bastille that he be sent "rich perfumes".

The prison of prisons, Alcatraz, expresses in its total isolation the paradox of air. The island of Alcatraz, located in the middle of the San Francisco Bay area, is constantly buffeted by winds and surrounded by a very cold, strong current. Perhaps this is why it was used until the mid 1800s as a strategic military defensive position for the bay. It became a military fortress in 1860, and was transformed in 1907 into a military prison, but it wasn't until 1934 that it became a federal penitentiary. The prison consisted of four independent cell blocks, and no cell faced directly the exterior. The cells for solitary confinement were underground and the inmates had no occupations, except for the "better behaved" amongst them. The fresh air brake in the high-walled courtyard and the half hour mealtime was the only two moments when the prisoners were allowed out of their cells.

Joseph Paul Cretzer, one of the prisoners, often found «the combination of odors, the odors that filled the place day after day – the salt air, the kitchen odors after dinner, the odors of sweating bodies – nauseating». Today the only permanent inhabitants of the penitentiary are birds and plants. The island of Alcatraz no longer hosts prisoners, but it is the nesting site of the West Coast's largest colony of seagulls. Even on days when the island is crowded with tourists there are more birds than people.

During breeding season, some areas are closed to protect the nests. A large colony of birds is also capable of producing a noteworthy odor that visitors can smell before their boat even reaches the dock.

Outside, Alcatraz smells of guano, sea salt, eucalyptus, and slightly of sulfur. Inside the cold prison cells one can imagine the former odors of cigarette smoke, excrement (the toilet is in the cell), and shaving lotion, mingling with the tension and fear, the solitude and boredom that must have hung in the air.

The cells were all identical but some of them were positioned so that their exposure to air currents made them unlivable. Off in the distance the inmates could see the unreachable city, a hoped-for life, normality.

A 1999 work by Petra Blaisse was created around the yard time granted to the prisoners of the Nieuwegein penitentiary in Holland. Blaisse designed a series of gardens with ground seashells, gravel, and sand giving each of them a different chromatic, tactile, auditory, and olfactory quality. An asphalt path connected the gardens to one another and created a sort of graphic element when viewed from the cell windows.

Atmosphere is My Style

"Atmosphere is my style", wrote Joseph Mallord William Turner in a 1844 letter to John Ruskin in response to the latter's yearning for beauty in a world threatened to be overwhelmed by the squalid grayness of industrial civilization. *Atmospheres* is also the title of a book by Peter Zumthor, one of today's preeminent creative minds who use the senses as a design tool. For him atmosphere is an experience more complex than architecture alone, as there can be no perception without a body, without being physically present in a place. The quality of an architecture is that of something which is able to stir our emotions, to affect us at first glance. We perceive an atmosphere through our emotional faculties, which respond much more quickly than their rational counterparts and give meaning to our existence and our survival. An atmosphere that is coherently able to stir emotions is composed of many sensory inputs such as light, sound, temperature, and odor.

It is a total approach to architecture going beyond the purely formal into an experimental dimension that engages the entire body. This is the direction of Zumthor's works, which are masterpieces not only of architecture but also of atmosphere. Each of his buildings has its own optimal temperature, especially in olfactory terms. Zumthor and his collaborators used a great number of wooden beams in the Swiss Pavilion at the

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Hannover Expo in 2000. The result is that visitors inside felt the coolness of a forest on a hot day. And when it was cool outside it was warmer inside even though the pavilion was practically open sided. The frame of the pavilion was made of unseasoned pinaster and larch wood which was thus drenched in sap and resins that released their scents into the air, giving visitors the sensation that they were in a wood-aging shed, an unforgettable atmosphere for mountain dwellers and an apt icon for Switzerland.

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6. Dry and Wet

Epidemics

Prior to Louis Pasteur's discoveries in the mid Nineteenth century air was believed to be a vehicle for disease and thus odors were perceived as a manifestation of the filthiness of the air. We may review the history of the foundation of cities, their orientation, and their urban plan, by considering their relationships with epidemics. Vitruvius captured this very concept in his treatise *De Architectura*, where he advised against building a city near a swamp because «[…] the breath of the monsters living there can infect the place».

Greek and Roman cities were impeccable in terms of the urban quality that was achievable at those times. It was with the Medieval cities that the first complications in terms of population density and air quality emerged. During the Middle Ages diseases such as the plague were thought to enter the body through breath. Hence treating the air, perhaps simply by sweetening it, was thought to be a means for combating pestilence. Sweet scents were considered to act as an antidote and so the early onset of an epidemic was fought with bonfires of pine, fir and other scented wood set alight in the streets, one bonfire every eight houses would keep ablaze day and night. Sulfur was thrown onto the fire periodically, producing dense and acrid fumes that caused lachrymation, rhinorrhea, and a burning sensation in the throat. The doctors who were forced to visit and treat the sick were completely covered in protective clothing. They wore long leather overcoats coated on the inside with honey-scented beeswax. They wore thick protective gloves and odd-looking masks with a sort of beak that were filled with fresh herbs and dried flowers.

During the Black Death epidemic in fourteenth and Fifteenth century Europe, enormous quantities of perfume, aromatic herbs, and potpourris

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were used in the attempt to rid the air of the pestilence and keep it far from the body. Resins and gums were also burned in the torches to perfume the air. Around the homes of the sick or dead a huge quantity of "plague water" containing aromatic substances was sprayed to create a sort of sanitary and olfactory cordon. Eau de Cologne originated as "plague water".

During the great plague of Marseilles in 1720 three fumigations were carried out: the first with aromatic herbs, the second with gunpowder, and the third with arsenic and spices. It was not until 1788, with the discovery of Javelle Water, or bleach, that the idea of disinfecting with perfumes was supplanted by chemistry.

Erasmus and the Birth of Manners

If the history of odors is also associated with the evolution of personal and social manners, a fundamental shift happened in the Sixteenth century with the publishing of *De civilitate morum puerilium* by Erasmus of Rotterdam.

Erasmus's treatise had a strong influence all over Europe because it was conceived as a work addressed to a broad audience with no class distinctions. It was a sort of handbook that went beyond culture and custom, presenting universal rules to help people emancipate themselves from their miserable conditions. Children's education was at the heart of said treatise as they were perceived to be the link between the emotional animal and the rational adult.

Erasmus was thus the precursor of a new standard of chastity and aversion, although hygiene was not a frequent issue in his work. His directives aimed at liberating natural functions instead of repressing them, which he felt could lead to disease. It was only later, especially in the Nineteenth century, that these indications would be interpreted as prescriptive tools serving to enforce self-restraint and a repression of instinct.

His treatise had a significant impact on childrearing and consequently on future generations. His educational approach aimed at making desirable social behavior an automatic practice, making it seem to each individual that a given desirable behavior arose from their own autonomous initiative, from an innate desire to ensure human dignity. These principles would later become dominant with the rise of the middle classes. Erasmus's book was grounded on the concept that the exterior manifestations of the body were an expression of the inner reality.

In his book *Power and Civility. The Civilizing Process*, Norbert Elias included some excerpts from Erasmus regarding bodily emissions and their

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legitimacy. These included the statement that repressing natural flatulence is an act of idiots who attribute more value to civility than to health. In his *Diversoria,* Erasmus addressed the differences between the customs in French and German inns. He described the dining room in a German inn as follows: «Some eighty or ninety people are sitting together, and it is stressed that they are not only common people but also rich men and nobles, men, women, and children, all mixed together… One washes his clothes and hangs the soaking articles on the stove. Another washes his hands. But the bowl is so clean, says one speaker, that one needs a second one to cleanse oneself of the water. Garlic smells and other bad odors rise. People spit everywhere. Someone is cleaning his boots on the table. Then the meal is brought in. Everyone dips his bread into the general dish, bites the bread, and dips it in again. The place is dirty, the wine bad… The room is overheated; everyone is sweating and steaming and wiping himself. There are doubtless many among them who have some hidden disease».

Morality

In the Third century BC Diogenes warned: «Beware lest the sweet scent on your head cause an ill odor in your life». The moral conviction that good smells nice and Evil stinks has roots that reach farther back than Nineteenth-century bourgeois morality.

In the thirteenth and fourteenth centuries the plague forced the closure of the major European bathhouses leaving people with no alternatives but to wear perfumes in place of daily bathing, as had already occurred with ancient Egyptians and Mycenaeans. In the Middle Ages plants were used as a means of protection, while perfumes became vehicles for the pleasures of the flesh. Almost no one washed themselves or their clothes.

The Council of Trent (1545-1563) forbade public baths in the name of morality. But this had no influence on the private dimension of cleanliness. Personal cleanliness continued to be valued and the consumption of personal cleansing products increased.

In the Eighteenth-century French courts were clean only in appearance. Everything was covered with a cosmetic powder that was applied everywhere, even on people's wigs. The expense for this item at the court of Versailles was enormous, much more than the cost for food, and the expenditures by Josephine de Beauharnais provided delightful fodder for the chroniclers of the local *gazette.*

It was only when people began to believe that it was all a question of bacteria and microbes instead of the machinations of the Devil that

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civilization surged ahead. The Paris of Haussmann incarnated the idea of both hygienic and moral purification. It was no coincidence that the plan entailed reorganization of both the "upper" and the "lower" city.

Utopias and Hygiene

February 14th, 1790 was a critical date in the history of hygiene. Jean Noel Hallé, who four years later would become the first public health director of the newly instituted Paris bureau, made the first olfactory survey of the Seine riverbanks to assess its environmental quality. This investigation would soon usher in a public debate on the disposal of excrement, sewage, and waste in France and all over Europe. Many grand and even utopian projects would stem from this.

The real fear, on the part of both hygienists and utopians, were epidemics, which were thought to be caused by the stench that reigned everywhere. In many countries hygienists succeeded in combating the strong malodor of cities, hospitals, prisons, and dwellings with grandiose projects. They built covered sewer networks, installed ventilators and bellows, closed factories, equipped hospitals with "commodes" that had extractible pans, treated cemeteries with salt, lime, and hydrochloric acid, drained cesspools, established regulations for sewer-workers, drained fetid swamps, patched, stuccoed, and painted walls, ceilings, and roof beams to protect against the external miasmas, and even applied "antimephitic" paints to furniture. The first municipal public health units were also established.

One of the more common issues was the deodorizing of crowded public places. This involved controlling and managing air circulation to guarantee an adequate supply of fresh air to all spaces. A new season of studies on ventilation was inaugurated thanks to Tredgold in Britain, and to Arcet and Peclet in France. Their research focused on a hermetic room for treating persons with pulmonary tuberculosis so that they would not have to spend long periods of time far from home. A room would be transformed into a climate-controlled greenhouse where chimneys were closed, windows sealed, and doors were prevented from opening too widely. In 1821, Arcet created designs for a stove with sufficient aspiration so that no ventilation via doors or windows would be required. The use of wind and machines, especially bellows and forced air ventilation systems flowing towards a heat source, found wide practical application. In the French capital, however, the latrine ventilator – to evacuate odors – was the only device in widespread use.

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In 1844 Tony Garnier dreamed of building a vast industrial complex for treating urine with the name "ammoniapolis".

It is important to understand how at this specific time in history the industrial revolution changed the odor of cities and architecture. The moral value of perfume reached its peak in this period. Those who were morally fit were also nicely scented, and vice versa, those who stank were closer to beasts on the social ladder. We still carry to this day the prejudice that those who are in frequent contact with bad odors are at the bottom of the professional scale: sewer workers, bathroom cleaners, "sanitary engineers", agricultural workers.

The Bourgeois Home

The separation between public and private space on the urban scale became an unavoidable issue following the French Revolution, whereas it was established more slowly inside the home, in the wake of changes in the roles of children, women, hygiene, customs, and morality that had begun in previous centuries.

Leaving the heterogeneity of the Middle Ages and the "shotgun" arrangement of interior spaces in European courts behind, the Nineteenth-century house was a labyrinth of sensorial deprivation and seclusion: visual, to screen oneself from indiscrete eyes outside of the family nucleus; auditory, to contain the voices of solitude described in secret diaries; and olfactory, as a hypocritical epiphany of a perfect world.

Heterogeneity – functional as well as and olfactory – was combated: there was a scent for every room, and they were never allowed to mix. The abolition of olfactory mixes separated the areas for preparing food from those for eating it, it barred the doors of the bath and the toilet, it separated organic odors from decorative scents. The latter were then employed to create a new olfactory aesthetic within private spaces.

The house was still insufficiently illuminated and over-adorned with fabrics that made it a sponge for odors. In spite of the fact that the use of corridors, stairways, and passageways now allowed independent access to each of the rooms, the air circulation was still insufficient to fully aerate the interiors. Odors thus found niches where they would stay and endure. At the end of the century the bourgeois dwelling still smelled of residual and stagnant odors that did not reconcile well with the social intentions of cleanliness and hygiene.

The rooms adhered to an olfactory protocol that illustrated many of the qualities of those who lived there. At the beginning of the Twentieth

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century the internal arrangement of the middle-class dwelling was still patterned on the moral laws of the previous century: a house with dark hallways and rooms enclosed within other rooms behind closed doors.

The unchallenged ruler of the house was the woman, who became the warden of the private realm, as well as its prisoner. Here odors became the yardstick of chastity and morality. The use of makeup on the part of morally irrepressible ladies was reduced. Analogously, in the household environment the balance between produced and applied odors followed the same rule of sobriety. Applying scents to spaces and to oneself became a question of hygiene and not the manifestation of a desire to seduce. The representation of morality became more important than morality itself and its physiognomy redesigned the domestic space.

The bourgeois house is still an enduring model for many with its curtains and slipcovers chastely hiding forms, with room deodorizers, air conditioning systems, and ready-made theories of order and cleanliness.

Dry Century

During the Twentieth century the idea that cleaning did not simply mean washing, but basically draining, introducing oxygen via movement, became unequivocal. The great enemy was stagnancy, accumulations which took place when production exceeded disposal capacity.

The 1900s were the century when spaces were dried out with sunlight, dehumidification, and the use of hard and impermeable materials. And it was precisely these methods for drying, dehydrating, and waterproofing, along with the use of non-breathable materials that pushed odors into oblivion and disaccustomed people to the presence of odors in architecture. The study and creation of scents was relegated to perfumeries and applied arts and all that was left outside the refined toiletry bottles was labeled as malodor and banished.

“Light and air for all” was the motto of the campaign against tuberculosis trumpeted by the architects at the International Congress of Modern Architecture (CIAM). The popular housing projects of those years, from single family dwellings to medium and high-density ones, were aimed at improving the hygienic conditions of the residents, natural lighting conditions, spatial orientation, and air quality. The logical outcome was the waiver t of closed blocks in favor of row houses, the only housing type that provided the possibility of good orientation to all lodging units.

Modernism designed interior air quality for functional, not poetic, reasons. The odor of architecture was not an explicit design component,

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except perhaps in rare cases, but it was nevertheless present and perceived in works of that period. At times it reinforced the concept behind the work, other times it shifted one's perceptive focus away from the functional center of mass to create surprising, interesting, or misleading aesthetic interpretations.

We always wonder how much the insistent smell of thyme in certain works of Alvar Aalto or Gunnar Asplund was tolerated and how much of it was desired, how much Mediterranean odor reached the rooftop gardens of Le Corbusier, how much odor of agave and scorched desert insinuated into the houses of Richard Neutra in Palm Springs, and what blend of tires, asphalt, and mountain breezes one could breathe in on the rooftop track at Lingotto in Turin, built by engineer Giacomo Mattè-Trucco to test drive the early FIATs. What is certain is that the odor of a place is always there, even if one seeks to abolish it. Actually, eliminating it becomes such a daunting task that it is something which is often wrongly overlooked in the hope that it will not interfere with the result.

Through its material dryness and dehydration, Modernism achieved an ideal that was at times aseptic, a clinical and medical aesthetic devoid of emotion and corporality. But the body is lost in an odorless environment, for it loses one of its fundamental compasses and is left feeling vulnerable. The urgency of smelling air becomes not only a means for judging its quality, but also a way of determining the setting in which one finds oneself. Perhaps it is for this reason that contemporary architecture, seeking moist materials with an olfactory memory, is introducing gels, which are simply colloidal suspensions of macromolecules in water, pulps, "non-woven textiles", or felts that are nothing other than wool or other processed materials.

Vapors and Mists

In order for an odor to be perceived it has to dissolve in an aqueous solution so that the mucous membrane in the nose can absorb it. Water as an olfactory solvent provides the essence of certain iconic places related to odors: water with sea salt, the flowing water of fountains, stagnant water in swamps, sulfurous spa water… eau de cologne.

We are beginning to see a significant number of contemporary projects that dedicate attention to the humidity of air and even emphasize its presence in the form of vapor or fog, to underline our emancipation from the idea that humidity is a vehicle for filth and a synonym for unhealthiness.

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One of the early works created in this regard was Shoei Yoh's *Prospecta* (1992) in Japan. It was a hollow cube conceived as an observatory on the surrounding landscape. Nature was the object of observation, and the natural spectacle was enhanced by special effects produced by a machine that released smoke, light, and musical effects.

Artist Olafur Eliasson in 2001's *The Mediated Motion* at the Bregenz Kunsthaus, designed by Peter Zumthor, superimposed over the rigorously orthogonal cement and glass architecture of the Swiss architect another, invisible, architecture, through the use of perfumes, fog, water, plants, and soil.

Architect Ned Kahn creates works that aim to show the expressive dimension of vapor, clouds, and air vortices, as in *Infalling Cloud* (2000) at the Rose Center for Earth and Space in New York. His *Cloud Rings* (1993) at the Exploratorium of San Francisco was a prototype for the Providence, Rhode Island airport terminal, where the architect sought to evoke the feeling of flying among the clouds. Another work, *Invisible Whirlwinds* (1987), at New Langton Arts of San Francisco produced a small-scale tornado using fans, curved walls, and the ventilation system that already existed in the gallery. Movements in the gallery altered the air currents and changed the shape of the vortex.

And of course we couldn't possibly overlook Steven Holl, one of today's most dedicated architects in sensorial and perceptive matters, and his 1998 Steam House at the Cranbrook Institute of Science. The building is a sort of experiment in how one can live in a very humid environment. It provides the organism with all its biological water requirements without any need for drinking, all through absorption through the skin. By means of a special nozzle, each drop of water is atomized and pressurized until it is so well airborne that it does not condense on the walls or on visitor's clothes.

The work that marked the threshold between material and immaterial in architectural imagery was *Blur Bar* by Diller and Scofidio at the 2002 Geneva Expo. It was a sort of lightweight pile dwelling structure made of a delicate network of water pipes standing over a lake. The structure was equipped with a system that extracted water from the lake and nebulized it to the complete saturation of the surrounding air, creating an artificial cloud that changed shape and consistency with changes in wind, temperature, and humidity. Through this building, Diller and Scofidio expressed the possibility of eliminating all traditional architectural elements down to the structure, constituting an architecture of sensations, of impalpable yet immanent elements, which are ethereal in the same way as perfume.

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Spas, Baths, and Saunas

Civilizations prior to the Romans undoubtedly had running water in their buildings: *terracotta* pipes brought water into baths and running water flowed under the lavatories of the Palace of Knossos in 2000 BC. The Romans, however, unlike others, designed drainage systems for entire cities. There were faucets in houses for running water; water ran through pipes from boilers atop the furnaces to fill the baths; and there were individual lavatories. Heating largely came from coal carried from room to room, but in cold lands such as Britannia and Gaul, as well as for country villas and public baths, the *hypocaustum* was used. This was a raised brick floor heated from below by furnaces.

Hadrian's Villa, built by the emperor in the First century BC, is a significant example of these architectures. The emperor wanted to incorporate into his villa all the buildings that had impressed him throughout his journeys. He also had a spa built in, comprising two complexes, the Small and Great Thermal Baths, whose rooms were always kept warm by an elaborate heating system.

Of equal fame are the Baths of Caracalla in Rome surrounded by gardens and gymnasiums. They had a circular room with a domed ceiling that was divided into a warm room (*tepidarium*) under the roof, and an open-air room with a swimming pool (*frigidarium*). The bathing process began in the *unctuarium* where people would select ointments and scented oils for their massages. The air, at an extremely high humidity rate, was therefore always strongly scented.

In Arab culture, hamam have always been scented places. Julia Pardoe, a Nineteenth-century English traveler, described the *hamam* in Istanbul as a phantasmagoric scene filled with heavy, dense, almost suffocating sulfurous vapors and busy servants moving about. Bathers were soaked up at the entrance, then scrubbed, rinsed, and perfumed. After the bath the bathers would relax at the poolside under the dome ceiling where they ate sorbets and serenely smoked the long pipes known as *chibuk* among the sulfurous vapors.

Turkish baths, saunas, and spas have always been associated with an idea of cleanliness and salubrity in which odors play an important, balsamic role. The thermal baths designed in Vals between 1990 and1996 by Peter Zumthor are perhaps the work of contemporary architecture that most strongly captures the idea of spa architecture, translating it (a decade before everyone else) into an extraordinary project. The building breaks with the tradition of 1920s baths which focused on principles of widespread light and air. One side of the Vals Baths leans against a

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mountainside, while all other sides are open towards the mountain range, granting beautiful vistas from each window and opening. The interior, faced in local gray stone, is immersed in water at various temperatures, in accordance with the various baths and the vapors they emanate. The body becomes one with the water which seems to flow through it in an act of purification. The small rooms with the various baths all have a sensory emphasis: temperature (hot or freezing); auditory (reverberation tank); or olfactory (rose pool).

Natural and Forced Ventilation: the beginnings

One of the central themes in all of Twentieth-century architecture was how to ventilate a building. Different architects came up with various methods for accomplishing it. There were two opposing approaches: on the one hand there were those who sought to take the air from outside and to bring it into the building without changing its olfactory qualities, only modifying it in terms of temperature and pressure. The other approach, a bit phobic, was to cut off all relations with external air via extreme filtration and forced flow, using technologically complex systems such as air conditioners.

If we look at three masters of modern architecture, we will see three vastly diverse attitudes and approaches.

Of the three, Frank Lloyd Wright was the one who most strongly took into account the air of the locations into which his work would be incorporated and included it as a design element. Most of Wright's houses were built in extremely meaningful natural settings, such as Oak Park, where he built the first of his prairie houses, or Bear Run, where he built the renowned Falling Water house for Edgar Kaufmann in 1935-39, or even projects in the outskirts of Los Angeles where the city meets the desert and olive and citrus groves grow thanks to irrigation, such as the Barnsdall House of 1917.

Air circulation inside these houses was the product of a meticulous design aimed at heating and cooling them. The air was also moistened by the passage of water flowing in and out of the houses through openings in the walls just below the roof, making them "breathe."

Le Corbusier's relationship with air was on the other hand quite a controversial one. He did develop solutions to support natural ventilation, such as the *pilotis* in Villa Savoye, the roof openings of the Beistegui House which transform the highest rooms into air chambers, or even the aeration chimney on the roof of the *Unité d'Habitation*. But when he

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turned to the use of machines for forced air ventilation the results were catastrophic. In 1929 Le Corbusier and Pierre Jeanneret were commissioned to design the *Cité de Refuge of the Salvation Army* in Paris and build a structure with a façade in hermetically sealed glass for the dormitories, designed to house 900 refugees. There ended up being 1,500 people. While winter went by under pleasantly warm conditions for the guests, the same rooms in the summer were transformed into such ovens that Le Corbusier had to modify his design allowing windows to be opened and installing partial *brise-soleil* to avoid being sued by the City of Paris.

It was Mies van der Rohe in his Lafayette Park apartments in Detroit who perfectly integrated a forced air ventilation system into a specifically designed frame located under the windows. The tenant thus had the choice between controlled natural ventilation and the option of installing an air conditioner.

The Compass Rose

Architecture for the sense of smell is like a large ship that responds to the winds, which opens its sails to the southwest wind differently than it does to the north wind, which steers by the sun and furls its sails when darkness falls.

Vitruvius writes about urban design in *De Architectura* stating that after the outer walls have been built, the distribution of the lands within the walls has to be worked out as well as the direction of the streets and alleys according to the changes of the sky. The orientation of the streets was important to prevent them from becoming wind tunnels. The offending cold winds, the vitiating hot winds, and the moldering humid winds had to be excluded by orienting the streets perpendicularly to them.

The same thoughts are found in an interview by Hans Ulrich Obrist with Cedric Price, who tells about a contest to which he had participated for the design of an area on the West Side of Manhattan. The idea was that that was the last open area of the city – it allowed the river's air to come through, and hence it had to be left intact as much as possible. He says that the Hudson River works as a cleanser, that for his design he always had in mind the Hudson water flowing into the ocean as well as the winds blowing from south-west. Price wanted to avoid placing obstacles in the way of the wind, to avoid creating areas of stagnant air. He designed a building where air could enter through windows, doorways, and curtains.

In eastern architecture it is the curtain which shows how air blows through the building, which shows its direction as well as the scents it

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carries. Hence the role of curtains in contemporary architecture cannot be overlooked, especially with an interpreter and experimenter of the caliber of Petra Blaisse. The curtains created by Blaisse and her studio, Inside Outside, are based on the concept that the curtain is not merely a barrier, but a second "smart" skin for the building, a membrane that filters wind, sun, sight, hearing, touch, as well as air. It was a striking experience for many at the *Movements* exhibition in New York in 2000 to find themselves confronted by a huge building-sized curtain mounted externally rather than internally. It was a spectacular operation, something between Land Art and advertising, micro design and architecture. That it was something more than a curtain was immediately clear, and a few years later Blaisse took part in the *Skin* exhibition at the Cooper Hewitt Museum, with an unequivocal explanation of her works: not curtains but skins, soft and breathing skins for the architecture in the dawn of a new millennium. The skin designed by Blaisse is inscribed in the identity of the building, but it is also a landscape with coy vegetable macrographics as at the Illinois Institute of Technology in a work by OMA, or at the Danish Embassy in Berlin in 2000. But they also work as acoustic curtains and theater curtains at the Grand Palais in Lille in 1994, and the Second Stage Theater in 1998.

In the works of Ned Kahn, wind becomes sculptor of the façade. His Technorama Façade for the Swiss Science Center in Winterthur (2002) is a wall composed of thousands of aluminum panels that move with the air currents and render visible complex turbulence patterns. A similar effect was achieved in the *Wind Veil* at Gateway Village, North Carolina in 2000, where the façade of a new parking structure was covered with 80,000 small aluminum panels fastened in such a way that they could move freely in the wind. From the outside, the entire wall seems to move in accordance with the wind. Another project, *Slice of Wind*, at the College of Engineering at the University of Colorado at Boulder in 1996, used 10,000 disks installed above the main entrance of the building which responded to the wind creating digital images which changed with the passage of air currents.

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7. Realty and Reproduction

Reaffirming the Real

The increasing attention towards the world of odors in recent years has been driven partially by the possibilities offered by new technologies in defining both architectural and everyday spaces. Communication media, which have revolutionized geometrical and temporal, anthropological and proxemic relations of distance and nearness, exhibit two different behaviors regarding the role of olfactory perception. On the one hand, they seem to be solely focused on developing the technologies of the visible and the audible; on the other, they seem to be seeking olfaction's complicity to make immanent that which in reality is not.

Olfaction, the sense of evanescence, illusion, of the essence of absence, can now lend itself to becoming a measure of immanence, presence, reality. One could think of it as a sort of synthesis of touch and taste, in which the rules of mechanics come into play every bit as much as the rules of chemistry. But the true current relevance of the sense of smell is captured in the words of anthropologist Franco La Cecla in an article published in the *Domus* magazine in the late 1980s: «[…] a geography of odors is only possible if we accept that they are fleeting. There are corners of jasmine without jasmine, façades of anise without anise, a carpet made of a weft of odors. The monotony of today's urban olfactory landscape is appalling. Automobiles and speed have killed nuance, variety, the very possibility of benefiting from the nature of olfaction. The passengers in boxes have their *arbre magique* that exorcizes them from the city out there and the 'exhausted' fumes have reduced our nasal code to a constipated gibberish».

The cause-and-effect relationship between a material and its odor that has always existed now seems to exist no longer. Odors are becoming more and more a decoration, an attachment added *ex post facto* to increase

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the emotional coefficient of the experience. The question of the relation between places and odors is currently to be considered under its two fundamentalist positions: the search for authenticity at all costs and thus the emphasis of the true nature of experiences, at times bordering on crude orthodoxy; and the emotional marketing of the experience of place driven by a market that hungrily devours architecture in order to convert it, at all costs, into a memorable and extraordinary experience.

Vanilla and Vanillin

In order to get a better grasp of the relationship between a material and its true or presumed odor, it may be helpful to review what happened in the world of perfumes with the advent of synthetic substances.

The entrance into the market of synthesized molecules was initially associated with the need to respond to the scarcity or disappearance of certain raw materials, or simply their high cost. The early synthesized molecules emulated the original substances, they were copies and their names emphasized this imitative origin. One of the first synthesized substances was vanillin, produced by Wilhelm Haarmann, a young researcher from Holzminden, Germany who, during the *Belle Époque, needed to substitute vanilla, whose name it explicitly evoked.*

At that time the debate generally orbited around the shift from artisanal to industrial production methods and focused on the relation between model and the copy. This is another one of those extraordinary examples where architecture, design, and odors come together, as shown by the seminal debates on the relationship between the original and the copy in contemporary architecture between Hermann Muthesius and Henry Van de Velde, between Adolf Loos and the secessionists.

Similarly, in the world of colors and materials the new was legitimized only if obsequious to the original, only if it could evoke the memory of something that had already existed. The entirely new was not expected, was not allowed. Only the most daring designers, perfumers, and entrepreneurs began early on to perceive the "copies" as being more interesting than their models and hence as elements in their own right, unbound from their generative matrices, and quite autonomously open to innovative compositions and intermixing. Vanillin, along with Bakelite, electric lighting, steel, and plywood would later become primer and more versatile ingredients than "true" raw materials, leading to new formulas and compositions. Brand new fragrances were created, substances which had no connection to any existing thing and were thus devoid of memory.

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In this respect, the work of Aimé Guerlain was extraordinary. He created the perfume *Jicky,* in 1889, marking a break with traditional perfumery. He did not seek to imitate nature, to reproduce well-known floral notes, but wanted to give birth to new emotions. His preference for chemistry over nature was audacious: *Jicky* was made with synthetic molecules and had a scent which evoked nothing other than itself.

In this interplay of original and copy, of counterfeiting, we must mention an hilarious ready-made by Marcel Duchamp, the *Belle Haleine: Eau de Voilette* (1921). He took a Rigaud perfume bottle and modified its color and label. The label is a true masterpiece: a photograph by Man Ray of Duchamp dressed as a woman.

Eating Aromas

The aroma industry aims at producing olfactory identities which can help implement one's experience of place, or that can contribute to creating new ones. It's a process which, in a way, explores new possibilities by denying the natural relation between places and odors.

One of the earliest experiments was invented by the Futurists in their *Futurist Cooking*, where they described an *Exaggerated Meal* where the guests «will not eat but will sate themselves with perfumes». The meal would have ideally taken place in a villa «whose electrically-controlled window-doors, controlled by buttons at the invitees fingertips, give: the first, onto the mass of odors of the lake; the second, onto the mass of odors of the granary and its fruit bin; the third, onto the mass of odors of the sea and its haul of fish; the fourth, onto the warm greenhouse and its carousel of rare scented plants moving on rails. An August evening. The smells of the surrounding landscape are at the height of intensity, but they are kept outside of windows sealed like the locks in a canal. […] Each guest will have a small hand-held fan with which to drive the enjoyed odor into the corner where it is sucked up by a powerful aspirator».

Several years ago, the same provocations – or avant-gardism, who knows? – re-emerged in Spain: in his most famous restaurant, *El Bulli*, chef Ferran Adrià would serve his dishes among scents released from odor-filled balloons; Martí Guixé created an installation titled *Pharma Food* which involved a system of nourishment that worked via inhalation.

These are exercises in style, but they are also indicators of ongoing transformations. However, as Gianni De Martino writes in *Odori* [Odors]: «We can touch the wall and flood the room with light. We can turn the thermostat and create summer. We can surf the Internet and

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experience the delicious chaos of thousands of impalpable encounters and expanded consciousness. But we cannot give up the scent of the rose, of bread, or of love. We still inhabit the world of food and beverages, of feces and death».

Hallucinatory States and Meta-spaces

We have already explored the capacity of odors to serve as vehicles for visions, as a bridge to some otherworldly dimension. Though it might also be interesting to consider the odor's capacity to be a vehicle for "mid-air" visions – that is, the "air-vision" capacity to see through air, therefore, to imagine something which is not here yet, or that simply isn't here.

Smoke, perfume, and drugs have always been hallucinatory media. Inhaling specific substances affects memory and spatial perception. They produce actual olfactory hallucinations one should handle carefully.

Set in the scenic and rugged landscape of Delphi, the Temple of Apollo was ancient Greece's most important religious site. It was the site of the oracle Pythia, the medium chosen to give voice to Apollo. Pythia's prophecy took place on the seventh day of each month, except during winter, in the temple's underground cell. The oracle, seated on her tripod, hypnotized and inebriated by opiate fumes, held a sacred laurel twig and a woolen thread connected to the omphalos, the sacred stone that symbolized the center of the earth. From the second millennium BC until the destruction of the Temple of Apollo in 394 AD by emperor Theodosius in the name of Christianity, Pythia's oracles influenced the political, military, civil, and institutional destinies of Hellas.

Before pronouncing the prophecy, Pythia would chew laurel leaves that induced a state of trance and then from behind a screen would mutter obscure words that the temple priests would decipher. The ecstatic states were probably caused by vapors that sprung from a crevasse, by the leaves she chewed, and by the water from the Castalda spring. Callimachus in *The Olive and the Laurel* wrote: «The seat of Pythia is among the laurels. She sings of laurels and sleeps on laurels». Hence the hallucinations were caused by gaseous exhalations, but they were exhalations that foresaw the future and shaped the imagination.

King Lear in Tudor England recited: «Give me an ounce of civet, good apothecary, to sweeten my imagination».

In Sumatra, healers (*batak*) would use *styrax resin* to enter a state of trance, as well as to roll the famous Javanese cigarettes on which Baudelaire sang "the transport of the spirit and the senses".

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In The Golden Bough Frazer recounts that in the Hindu Kush the sibyl would find her inspiration in the light of a fire of sacred cedar twigs, over which she would bend her head wrapped in a cloak, breathing deeply. She soon would be seized by convulsions and fall unconscious to the ground. When she came to her senses, she would pronounce the prophecy.

On the island of Madura off the northern coast of Java, each spirit has its own medium through which it communicates with the living. In preparing herself to receive the spirit, the medium – usually a woman – sits with her head on an incense burner for a good while before being taken over by convulsions and falling to the ground.

Shamans in South America use tobacco as a means of entering the spirit world. They are not smokers, they are smoke eaters; they then blow it out to cure the sick, to drive off evil spirits, or to protect the harvest. In order to achieve a state of trance and to see visions that bring them into contact with the supernatural, they inhale mouthfuls of smoke from their pipes. Tobacco nourishes the spirits, who in return protect the people in a symbiotic mutual relationship.

But perhaps the most poetic victim of hallucinations and fantasies is Don Quixote who, upon seeing his love Dulcinea, exclaims: «[…] these traitors were not content with changing and transforming my Dulcinea, but they transformed and changed her into a shape as mean and ill-favored as that of the village girl yonder; and at the same time they robbed her of that which is such a peculiar property of ladies of distinction, that is to say, the sweet fragrance that comes of being always among perfumes and flowers. For I must tell thee, Sancho, that when I approached to put Dulcinea upon her hackney (as thou sayest it was, though to me it appeared a she-ass), she gave me a whiff of raw garlic that made my head reel and poisoned my very heart».

Sometimes They Come Back Again: Odorama and Synesthesia

Some utopias are never dismissed and tend to come back at regular intervals, perhaps somewhat as a provocation, or in the hope that now it may finally be the right time for their happening.

After the spread of home theater and Dolby Surround, odoramas were bound to make a come-back. Odorama was a means of projecting scented films in order to provide a more immersive experience for the spectator. Invented within the underground film world of the 1960s through the films of Yervant Gianikian and Angela Ricci Lucchi, it was further developed in

the 1970s with the better-known films of John Waters, such as *Polyester*, where the audience was given special scratch-and-sniff cards with numbers corresponding to different odors in accordance with which scene was being projected. *Odoramas* are back and around the world new methods are being implemented where, instead of scented cards, there are special machines which generate puffs of wind and fog as well as scented breezes.

The roots of stage machinery used to emphasize theater or film through odors actually reach farther back. At the beginning of the Twentieth century an "odor organ" was built and played during recitals organized at the London Central Hall. It was based on the same idea that odors can influence the audience's emotional state.

In the 1970s, Superstudio developed a number of utopian projects which have since made regular reappearances in order to provoke a reaction, or perhaps simply for nostalgic reasons. Linked with odors was *Città 2000 t.*, a single, uninterrupted building composed of cubic cells arranged in one specific order. Each cell had two walls giving onto the outside made of an opaque material which l was permeable to air, rigid, but soft to the touch. One of the walls emitted three-dimensional images, sounds, and odors, while the opposite one was occupied by a chair that would stick perfectly to any given body to the point of enveloping it completely. Each dwelling unit included apparatuses that were capable of meeting physiological, alimentary, excretory, and sexual needs. The membranous substance comprising the apparatus would, when not in use, retract along with its accessories, leaving a blank wall. The ceiling was a single screen that received cerebral impulses and transmitted them to an electronic analyzer, which compared and balanced the desires of each individual in order to keep all citizens in a condition of equality.

Ubiquity

If we were to analyze human desires in depth, humanity's as well as individual's true aspirations, we would discover that substantially there are not a great many of them, but rather a few primary desires that constitute matrices for many others.

One of the more deeply rooted desires is that of ubiquity, i.e., the ability to be in different places, different contexts, different realities at the same time. Ubiquity carries with it the need for temporal synchronicity, for simultaneous experiences in different places. The ubiquity-simultaneity equation gives us the strongest impulses towards new communication technologies.

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In *From A to B and Back Again* (1975), Andy Warhol wrote that odor is fundamentally a means of transportation; that sight, hearing, touch, and taste are on the contrary not powerful enough to transport one to an entirely different place. In this sense odors are extraordinary vehicles for traveling through both space and time, as well as devices for inhabiting different levels of existence simultaneously, for an odor carries the mind to a place that is different from the one in which the body resides. Furthermore, the olfactory experience has the particular characteristic of bringing absent or even unreal places to life, still producing very real emotions and concrete bodily reactions, just as memory does.

It is a sort of voyeurism which allows certain olfactory behaviors to exercise a new rule over desire: the odor of a lover brings her closer than her photo does, as in Gustave Flaubert's deferred love for Louise Colet. In spatial terms it is a question of being in one place and breathing the odor of another so that the second one superimposes itself in some way onto the first. It is the most immediate exercise suggested by odors, as Marcel Duchamp grasped in 1919 with *Air de Paris*, as is exemplified by perfumes that adopt the names of places, or as in Martí Guixé's recent creation *Montserrat Olor*, which evokes the local odor of the sacred mountain behind Barcelona.

Projects that seek to give concrete form to the ubiquity engendered by the sense of smell include those by Korean artist Do-Ho Suh who creates ultralight, intangible, but real architecture. *Seoul Home* (1999) recreates the Korean home in a translucent textile (silk, organza) version that can be brought along on travels, a thin guest, a diaphanous architecture in the homes-away-from-home where it may abide.

Hyperventilation

The reproduction of wind and its mechanical, thermal, and olfactory qualities is the focus of some architectural experiments and works.

This is no news if one thinks of the *fumarole* on the island of Pantelleria designed to better exploit the volcano's inner air, and a number of significant works of bioclimatic architecture. Nevertheless, recent progress in flow management has led to the development of particularly interesting new buildings. One of the earliest ones was Toyo Ito's Wind Tower in Yokohama, built in 1986, which converted wind speed and the direction and intensity of traffic sounds into electrical signals that dynamically illuminated the tower-like structure.

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Steven Holl's Turbulence House in New Mexico, built in 2002, is a more recent work developed around an empty space through which desert winds can blow. The house has a solar-panel power system and a rainwater collection tank. Its form is conceived to look like the tip of an iceberg suggesting a much larger hidden mass below.

The idea of wind as a grand sculptor is most certainly embodied in many works by Renzo Piano, from the air intakes at the top of the Centre Pompidou in Paris (1977) to the Kansai International Airport (1983) or the Jean Marie Tjibaou Cultural Center (1983) in New Caledonia. But what is perhaps his most iconic work in his exploration of his relationship with the power of wind is the Wind Tunnel in the Renzo Piano Building Workshop in Maranello. In comparison to its predecessors, such as the wind tunnel built by Gustave Eiffel in Auteuil in 1912, in Piano's Maranello work the giant tunnel structure is not enclosed and hidden within large industrial blocks, but rather left in full view: a sort of huge 70×80 meter engine. The huge tube seems to rest haphazardly on a slope, a design feature which provides dual access to the test room. The models to be tested, up to a scale of 1:1, are submitted to a high-quality flow of air (in terms of turbulence, angularity, and uniformity) generated by a 2,200-kW fan 5 meters in diameter. A sort of treadmill underneath moves in synchrony with the wind speed in order to cancel out the edge effect between the vehicle and the ground.

Pneumatic and Inflatable

The ascensional power of hot air was one of humanity's great discoveries, allowing us to reach hitherto unattainable heights, to move swiftly to "fly". It was first discovered through an empirical process two thousand years ago in the desolate lands of southern Peru, as indicated by the huge geoglyphs, some of them ten or twenty kilometers long, in the Rio Nazca valley. It remained an ambition which, over time, drew in many scientists and inventors, as recounts Benvenuto Cellini on Leonardo da Vinci who would conduct experiments on the banks of the Tiber with hot air flight, inflating the bladders of dead animals. But it was the Montgolfier brothers who, in the late 1700s, finally succeeded in filling huge balloons with hot air and lifting them off from the ground.

Using air as a structural element is possible in structures such as gasometers with their metal frame and internal bladder that are inflated or deflated to accommodate the gas. A project along these lines is the work of the group of young designers known as the Breathing Design Team created

for the Nam June Paik Museum in Korea in 2004. Conceived as an artificial lung, it was designed for a number of functions including that of circulating air inside the building. The outer layer is a membrane connected to pistons that evenly distribute the load over the entire mobile wall. Everything is controlled via a series of devices such as video cameras, microphones, photocells, and sensors for humidity, wind, and smog which provide data to the central computer program which then regulates the functioning of the building. Bioclimatic control is achieved through the cyclical inflation of the external skin, which, like a lung, opens a valve to let air in at the moment of maximum expansion, and then lets it out again as it collapses.

Pneumatic or inflatable structures seem to have recently made a significant comeback for they solve a number of problems of contemporary architecture regarding temporariness and large dimensions. It was the ambition to achieve perfection, embodied by the spherical form and the lightness of a dome, that led to what we now call inflatable architecture. This is well exemplified in works such as the Allianz Arena in Munich by Jaques Herzog and Pierre de Meuron for the 2006 soccer World Cup. The structure comprises an envelope consisting of 3,000 pillow-shaped panels in ETFE. The panels on top are transparent to let light in, as well as UV rays which keep the grass healthy. The façade panels are translucent and display recessed spotlights that change color depending on which team is playing. Each panel can be inflated with dehumidified air at varying pressures to withstand the loads caused by wind or snow.

Desert Seal is a prototype designed by Andreas Vogler and Arturo Vittori which was presented at the *Safe* exhibition in 2005 at the New York MoMA. It is a sort of tent whose form and section were designed specifically for sleeping out in the desert. It resolves the problems of protection both from the sun and the wind, which is of critical importance in preventing dehydration in hot and dry climates. Its L-shaped section provides optimal air management: during the day the cool air at ground level is driven into the tent through an opening at the top; at night the opening keeps warm air in. This opening, which functions as a natural ventilation system, is used in traditional Islamic architecture for air circulation. It is noteworthy that this micro-architecture also performs optimally in the opposite conditions, i.e., in arctic areas. The tent can host one person either lying down or standing up.

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Encounter 1

ZAANSE WINDMILLS, AMSTERDAM – The invention, in 1596, of a crank which made it possible to transform a rotary motion into a vertical movement, turned this flat, windy coast into a thriving industrial center. Between 1600 and 1875 thousands of windmills, churning out products for some thirty-four industries, studded the landscape. Wind generated power allowed the Dutch to saw wood (thirty-seven times faster than by hand) for boats, which, also driven by wind, explored and colonized lands all around the globe. The riches of the colonies – spices, chocolate, pigments – were then shipped back to the windmills for processing.

PETRA BLAISSE – She is the founder of *Inside Outside*, a textile, landscape and exhibition design studio based in Amsterdam. *Inside Outside* explores the boundary between interior and exterior; architecture and landscape; and the effect of movement. One of her recent large projects in partnership with OMA was providing landscape, curtain, and carpet designs for the Seattle Central Library.

MARTIN GRAS – He is the perfumer behind renowned fragrances such as *Cerruti 1881* and *Boudoir* for Vivienne Westwood. He has conducted research on the relation between odor, music and color. He has sought unknown woody notes throughout European xylotechs and is involved with the fragrance possibilities of genetic engineering. Another recent project of his was to recreate fragrances using Renaissance era formulas.

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MG – There isn't much odor in this mill, the chalk doesn't have much odor. There will be more in the paint mill, but the chalk itself is not giving me that much.

PB – I had a different reaction – the first thing I smelled was pipe tobacco [belonging to Piet, *the mill's operator*], very strong, then the chalk which you can smell because of the moisture. I remember when I was at school and people would still write with chalk on the board; here I can sense this smell as well as that of the felt eraser.

MG – I did some research on pigments in Renaissance paintings for a lecture on color and odor. There is a flower whose odor is used in perfumery, and whose color is used for pigments, and that is broom, in French, *genet*. It's a bush full of flowers that one can find all over France. That's where you have color and odor together. Broome is used both in painting pigments and for dying embroidery.

PB – Dyeing factories and perfume factories are often alike. Would you ever describe the scent of *genet* as yellow, is there a connection for you*?* Because it does work the other way around – if you see a yogurt that is pink, you'll think it smells of strawberry, and even if it tastes of banana, you'll still think it is strawberry. So, there must be a psychological effect.

MG – You can give it a color, when you smell a raw material, you want to give it a color. Now would I give the color yellow to *genet*'s odor? Probably, yes. I recently was a judge in a rose competition, and I smelled a yellow rose that had a citrus note, so *there is* a certain relation between color and smell. Smell has an evocative power that the other senses don't have. Only the nose can transport one directly in another situation. The nose used to be very important in the past, but now we use it less and less. Animals have longer noses than we do. In human evolution the eyes have come out of the head and the nose has gone backwards, so physically we are changing.

PB – In our work we seek to create atmospheres that can make people happy, that put people in a specific mood. One might wear a perfume for the evening that makes them feel sexy as they're going on a date. Perfume aims at making one somewhat closer to the opposite sex. Some perfumes are more for the daytime, they can imbue one with energy or make one feel fresh or trustworthy or naïve or grown up or complex… It works psychologically. And the same applies to my work – if we create curtains and materials, it's not only for the eyes and the touch, but also to move the air around and work with scent, like in gardens. I once designed curtains with herbs sewn in the seam, so that when they moved around, they would release this smell, and nobody would know where it came from.

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There is this thing called air-curtain, that is a wall of air that changes the climate. It's interesting, for one can't see it, there's only air. In a roof-garden design we did in Korea we used a steam curtain. We created a shape that you could step into, a kind of spiral you could walk through, with two or three layers of steam. It changes constantly in accordance with the wind. It would be very interesting to use it in warm and cold climates and see how the difference in temperature affects the vapor drops. If a water drop gets to a certain temperature, it can be like a bullet, like the archerfish that shoots a drop to catch a fly. Fantastic!

MG – Steam curtains are used in theater too, but I am sure you can turn it into something even more interesting.

PB – Dry ice is used a lot in pop concerts. *In the Casa Da Musica* there were these clouds, and it was beautiful how they would catch the light. Between the curtain, the gold-leafed walls, and the steam, there was a very nice interplay of structures and colors. But it is very important to take scent into account. There are materials, like plastic and rubber, which release gasses when they heat up and their scent can be smelled very strongly. The projection screen that we use sometimes gets this baby doll, Barbie-like smell. Wood has this tendency to smell when it gets moist, but that has its own kind of beauty, if it's not too strong. You realize that this scent could become an element to incorporate in a certain space. If you have wooden floors and walls, like in Swedish or Swiss architecture, you have to play with that smell.

MG – Woody notes in perfumery are very important. Trees give perfumers more natural raw materials than flowers do. When people think of perfumes, they think of rose, jasmine and exotic flowers, and little about sandalwood, myrrh, *olibanum*, *ciste*, opoponax, *styrax*, tolu, elemi or Peru balsam. Human beings are closer to trees than one thinks. Through photosynthesis trees transform carbon dioxide into oxygen and water into sugar, elements which keep us alive. Actually, one could live on trees, but one wouldn't survive without them.

There are many constraints for the perfumer when creating a fragrance. First, they should have a great idea; then they will be somewhat limited by the customer's price, and they will need to be able to cope with long lastingness and diffusion. Some perfumes are long lasting but don't diffuse. Other perfumes are better at a low concentration than at a higher one. It's all a mystery! It's a lot of work to realize this great new idea; all the components in the creation should be just right. If there is a mistake in the structure, the fragrance just "sits" on the skin and doesn't diffuse, or it even evolves during the day. With perfume, like with music, the formula is written, but the moment of the

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appreciation comes and goes. A fragrance should not be three different fragrances throughout the day. It should stay one whole composition. There should be harmony between top and base-notes. Whether the perfumer creates a light transparent fragrance, or a warm, dark one, the perfume should retain these characteristics all day long. The perfumer should be able to select the right raw materials and know in which proportion to use them.

PB – It's so interesting hearing you use the same words I use – lighter, darker…

MG – But you don't talk about long lastingness or diffusion, do you?

PB – Well, I do talk about diffusion in relation to the effect of light and sun on curtains, because usually the curtains we make are technical ones. They deal with sound, light, air or climate, or they aim at creating a space, at changing it, or at making its trespassing impossible. But we do have to think a lot about time as well, for in the very moment we start using the fabric it begins to degrade, it does not last forever. One creates things for a certain time frame and depending on the climate and the context they will survive for a given amount of time. Theater curtains have to last 12-15 years and they have to withstand use, moving up, down, left, right, every day, for 15 years. If the climate of the theater is too dry, they'll go quicker, they'll fall apart at a certain point. Silk doesn't last long; it degrades and reacts to UV light, so you don't plan on using it for more than 5 years. In that sense curtains are always very temporary, temporary architecture in a way. And that is ok, for as the culture, the client or the organization all develop in time, in ten years' time they might have a different mentality anyway, and they'll probably already want to change the color or the symbol of the building. With gardens, time works the opposite way. Gardens need a lot of time. You plant them and then it takes 5-10-15 years before they look like anything that you might have imagined. If it's not hard material, if it's planting, with soil and grass, you need conditions that will help it grow and survive.

PB – People leave their traces on buildings. So does the landscape, the context – these make the building what it is in the end. The smells of an identical building in Seattle or in Ho-Chi-Min City are as different as their respective temperatures and climates. The climate created by the inhabitants and the natural climate – airborne salt and micro-life – all have an immense effect on the life of a building.

MG – Home designers should start from interior design before going to exterior design. We once had one fragrance project inspired by Mexican architect Barragan, which became something very interesting.

With fragrance you can build a theme. If you have a room which is very warm or very cold or clean or Japanese, you can build that into your fragrance.

PB – But how? Psychologically?

MG – No, by the way you feel, the way you perceive the place. Physically you don't see it, but it is the way you feel in it.

PB – But you're saying that you can implement it in the perfume you're making. The ideal Japanese space?

MG – Yes, but it still will have to be a perfume – this is where the problem lies. Clients demand perfumers be creative, but it's like rose competitions, you have to pick the best smelling rose, which must smell like a rose, otherwise it is out of the picture. It's the same with fragrance: when you make a fragrance, it has to be a perfume that you can wear. So the frame should be there, and inside that frame you can create whatever you want, what you feel, and what the client wants. But it's got to stay a perfume, and not merely an odor.

PB – In what I do there is a problem which is "lifestyle", the syndrome of putting scent in the living space, which I have an allergy against; like in taxis where you get this horrible synthetic pine tree deodorant that debilitates your brain. I am not thinking in that mindset with my work, at all. I used to design exhibitions and in one project for OMA, sound was supposed to influence your sense of space. In a very small room, totally dark, there were models of city planning. Then we had a sound that made you think that you were in an enormous echoing space, like a tennis game where the ball goes *tock… tock*, or a train endlessly passing by. We used these sounds to emphasize what the architecture was about, and also for the viewer to emotionally understand architectural scale. In that sense we did it in a synthetic way, but it had a mesmerizing effect. With textile you cannot create sound, (except that you can hear and feel it when a cloth or a curtain moves through the air), you can only filter it or reflect it, or absorb it. Did you ever use the scent of grass? It's a very spacious scent.

MG – It is the outdoors, so automatically you smell it, and you feel outside. It can be imitated with only two synthetic raw materials, *cis 3 hexenol* and *cis 3 hexenyl acetate*. Many years ago we analyzed the odor of grass and found over 50 raw materials or molecules.

PB – So you imitate it with synthetic molecules, you don't use real grass?

MG – We can imitate a flower almost 100% and we can make it smell even better. That's why we don't do any extractions or distillations out of the lily of the valley or carnation. Most of the synthetics we use are analyzed in natural oils and synthesized, so they are not fully

synthetic. They do exist in nature and with synthetic molecules we can emphasize certain characteristics of flowers; we can improve upon them, for instance, by pushing the spicy note in a carnation or the fruity note in a rose. When a customer imposes an extremely low price, the perfume risks being too synthetic and smell "cheap". A fragrance needs to have a certain percentage of natural oil, to give it richness and beauty. You can't cheat on quality, as the best cooks would say.

PB – It is weird that with perfume there are the same tendencies as everywhere else. They go on par with social and economic changes, but surely not political ones; do you have different perfumes now that we've got rightwing Christian governments?! Bush, Berlusconi, Balkenende…?

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Encounter 2

MEATPACKING DISTRICT, NEW YORK – The former cobble stoned section of downtown Manhattan occupying a shrinking area sandwiched between the West Village and Chelsea. For decades, sides of beef and pork would be brought to this district to be sawed down, cut up and trimmed for distribution among the city's restaurants. Most of this industry has been relocated to New Jersey, but a few die-hard establishments remain, withstanding the onslaught of fashion boutiques and restaurants.

ELIZABETH DILLER – She is a member of Diller Scofidio + Renfro, the New York based architecture firm. One of their current projects, recently highlighted in an exhibit at the New York MOMA, is designing the High Line, the park promenade that will rehabilitate part of the elevated railway that runs through the Meatpacking district.

ROGER SCHMID – He has been a renowned figure in the fine fragrance industry for years. While working as global fine fragrance director for a major fragrance supplier he co-founded the University of the Image, a school in Milan whose curriculum is focused on the five senses. His current venture is *Nose About*, a multidisciplinary network dealing with scent and also its relationship to the other senses.

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RS – On 9/11 I was coming back from Wisconsin, from the Johnson's Wax Building. I was stopped in Manhattan at 14th Street, and I remember the smell of burning tires. All over the city: rubber. A smell that is probably now stuck in people's memory, a very powerful smell. The smell of the Meatpacking district was the smell of blood.

ED – Manhattan has a particular scent – a combination of many smells. Here in the Meatpacking district the scent of blood is combined with fat. I used to live behind a sausage packing plant whose drains were right next to the only windows I had. It's a smell that I now associate with home. The post 9/11 smell lasted for some time. It was connected with an apocalyptic feeling. Now you cannot disassociate that smell from death. Often bad smells are associated with badness. Good smells with goodness. Scent is tied to our morally based Christian culture. Good scent is equated with truth, honor and honesty. We overly condition our air. We take out all the evil that's in it: humidity, smells, heat… We want total control over the environment. It's the kind of control that neutralizes everything and turns it into nothing, a flat line condition, a culturally identified comfort zone in which everything is average – a sensory deprivation. This is an economic issue as well.

RS – People feel discomfort around smell, in western societies especially. Smell is a way to express something, and some people feel this discomfort in expressing something through odors. There is a total discomfort with body odor, for instance. This is an antiperspirant Country. The funny thing is that sometimes the smell ingredient that we put inside these products is a kind of copy of the body odor, a chemical imitation of bodily smell.

ED – This is an interesting perversion – once more, control over nature. The relation between culture and smell has been inverted in a funny way: you buy nature through chemistry, but unmediated nature is unacceptable.

RS –The smell of fast-food places like Taco Bell or Pizza Hut is awful. You even get it when you are at certain airports. This odor is terrible and invasive. To me this kind of bad food is very aggressive and unpleasant.

ED – Actually I am very fond of what we culturally regard as bad smells! A bad smell experience for me is the interference of an eau de cologne with a good meal. Restaurants should have scent-free zones, like no-smoking areas. As an architect, smell is not something that I consciously design but it is in the mood set by the architecture.

ED – Air is an aesthetic medium. The Blur Building was designed as an atmosphere. We engineered, monitored, and controlled it, with the

expectation that "breathing" the building would make one feel high. Blur had no walls – it was only a structural and plumbing system set on Lake Neuchatel. We took water from the lake, filtered it and distributed it through a high-pressure fog system of 32,000 nozzles. The water is atomized into the air to make a huge cloud that you can inhabit. The water had to be very pure in order to be breathable as the lungs cannot deal with impurities the way the digestive system can. We were concerned about giving the Swiss public legionnaires' disease. We learned a lot about federal controls over air and water. If you look at any new building today, 30% of the cost is in mechanical systems that control internal climate. Generally, climatization is based on norms, but you can see how a system can be controlled to integrate aesthetic and pragmatic desires. It is very possible that mechanical systems will be the next frontier for architecture. The treatment of water, air and even electricity – we never think about them, architects are rarely involved in these fields, except defensively to protect our designs from cruel mechanical demands. Air management needs to be taken away from mechanical engineers and given over to architects. We can affect the atmosphere from within. When you use a perfume or a candle, you change the scent of a thing or a space superficially. But designing air and scent can be thought of in an infrastructural sense. It's the difference between putting on a perfume or eating potatoes to exude a unique smell from perspiration.

RS – Again I think that it is linked with one's discomfort with odors or just with education. When I enter a house and there's the smell of food, of the fireplace, the bathroom… To me this is pleasant, maybe because I grew up in Italy! You create something simply through your lifestyle without adding anything. I live between New York and Paris, and here in New Jersey I've seen the best kitchens in the world, but no one is cooking! In Paris, kitchens are as small as this table, but you see wonderful food in them. Even eating too often in restaurants you miss a part of the experience; you do not enjoy it as much as you would at your home sometimes.

ED – A problem of our culture is that we are ocular-centric. Sight is often more satisfying than all the other senses combined. A lot of architects today are interested in creating special effects, whether it be acoustic, visual or atmospheric ones. We should pull scent apart from general atmospheres to work with it.

ED – Once I made a limited-edition perfume called *No Means Yes.* I wanted to create a scent that was foul, a turn-off yet sexually appealing, nevertheless. I worked with a perfumer to develop the scent

and realized that I had no vocabulary to describe the desired olfactory effects except for by analogy. It is very difficult to express scent.

RS – In my experience developing the *Helmut Lang* fragrances the concept was the smell that you perceive in the morning after having been in bed with someone, after this someone has just left. We were looking for the smell of skin, a very sexy smell. For an exhibit in Florence, *Arte e Moda*, we had recreated the smell of sperm, and we presented it! A big cultural problem is not having an appropriate vocabulary for the senses, whereas in old societies it used to exist. I was in British Columbia recently and they told me that among the native population still living there, the elderly people can understand who you are just by your smell when you enter a room. They're much more linked to nature and it is impressive because it seems that we have taken away all this with technology. We thought that this was progress somehow.

ED – There's a huge technological gap in our society. We easily reproduce sound and sight to the highest fidelity and definition. But what about smell?

RS – Now it is also possible to do it with scent, to record, filter and reproduce a smell. This is probably where architecture could be the answer – to orchestrate the smell so that it becomes part of our well-being. Perhaps starting with the private home, you could discuss smell in the same way you discuss materials, colors…

ED – Since we can use, decompose, and analyze everything, how great would it be to use these technologies and scent-sensitive instruments as a souvenir collector? Military and NASA instruments applied to everyday use.

RS – Scent could be a great medium for capturing time as well – to record and select smells that might cease to exist. That would be beautiful. We should start now capturing the scent of things, especially considering how things are going in the world.

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Encounter 3

CATACOMBS, PARIS – Twenty meters below the street level of Paris, 14th arrondissement, a serpentine tunnel meanders along almost eight hundred meters. At the tunnel entrance is the warning: «Stop, this is the realm of the dead», beyond which lie the dried bones of approximately six million permanent residents. The first bone piles came from the Cemetery of the Innocents, in the center of Paris, which, after almost one thousand years of use, was evacuated for sanitary purposes. The catacombs piqued curiosity from the beginning and hosted such illustrious guests as Francis I, emperor of Austria, and Napoleon III with his son.

PHILIPPE RAHM – He is a Paris-based architect. He was one half of the former design team Décosterd & Rahm, which disbanded in 2004. His works have been presented at the Venice Biennale, the Cartier Foundation, and the Centre Georges Pompidou in Paris, among others. He was a member of the *Villa Medici*, *Académie de France* in Rome in 2000. He is Master of the Diploma Unit at the AA School in London.

MAURICE ROUCEL – He is one of the world's most successful perfumers, responsible for such works as Hermès' *24*, Faubourg's *Tocade*, Gucci's *Envy*, DKNY's *Be Delicious*, *L'Instant de Guerlain*, and *Musc Ravageur* for Frederic Malle.

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MR – Naturally during decomposition, the body releases a lot of chemicals, which are generally ammonia derivatives. Some of which are very, very strong and disgusting.

PR – A book by Friedrich Nietzsche explores what beauty is and what it is not. This book is more a question on the odor of death. He states that if we define something as awful, it is because we feel the smell of death. Its chemical relationship reminds us that it is dangerous for the body, that it could corrupt the body. It is the idea that decomposition is not beauty. It is not an aesthetic but a chemical relationship with the smell of death.

MR – Yeah, the smell of decomposition is dangerous. It's like when you smell gas – the gas itself is odorless; we have to mix it with a scented product, in order to realize whether there's a leak or not s. One can perfume everything. In Istanbul a Muslim king built a mosque and put real animal musk inside the cement. It still smells one thousand two hundred years later. A piece of wood or paper or clothes can be injected with micro encapsulation so that every time you move you break the microscopic capsules that release perfume. Technologically speaking one could perfume wallpaper and this smell could last for many years. The problem with scented wallpaper is that it is impossible to change its smell – you have to take it off and that's a bore.

PR – A key question in looking at the relationship between perfume and architecture is to understand whether perfume could be an architectural element that could evolve or change, like air…

MR – You have to fix time with perfume. Picture perfume as an orchestra where all the raw materials inside of the bottle are all playing at the same time. Little by little, as time goes by, the lightest molecules will disappear, and the strong molecules, very heavy ones such as vanilla, sandalwood, will stay. According to the evaporation you have to seek the accord; and it has to be nice. You cannot build a perfume without a foundation. Perfume is like a symphony. You put together different molecules and there you have an accord. You have to be playing this accord for one and a half hours; this means that you have to make it beautiful, long lasting.

PR – I did a project some time ago that explored the question of spirituality and odor. It was also a kind of provocation about the disappearance of space, of the symbolic aspects of architecture inside a spiritual place. Before, the church used to be built like a cross and the cross was the body of Christ. So you go inside the body of Christ when you go to church, you eat the *ostia,* and you eat the body of Christ. You are doing a sort of body swap with Christ. When Modernism comes

at the beginning of the 20th century, this symbolic aspect disappears because in Modernism we don't want this symbolic aspect of architecture anymore, we just want form to follow function. So the first church at the beginning of the century was like a factory and there were some controversies. Maybe it was difficult for people not to have symbolic meaning in church architecture, so it is the light in architecture that becomes the symbolic aspect. It's a paradox that symbolism, excluded from modern architectural form, has found refuge in the treatment of light. If you look at the Corbusier church, there is a very precise way to put the light inside the space. Another example is the church designed by Tadao Ando: the form of the church is like a modern factory, yet the symbolic representation of the cross returns, no longer in the form of the church, but in the form of the light. There is no more formal design for the church, but it becomes a symbolic light. Following this process whereby shape and form disappear, we also tried to erase the question of light and just follow the question of air. We created the *Buon Odore del Cristo*, with perfumers Christopher Sheldrake and Christine Nagel from *Quest International*, because there is *l'odore de sainte* when he dies. They opened the tomb, and you could feel a good odor. In the Bible or in some other texts you can find descriptions of the odor of Christ.

MR – You are talking about the Gospels… The body of Christ had little odor left, because it was written at least forty years after his death. At the same time, we are talking about religion and religion is political power. When you build a big church, you feel small inside the cathedral. The smell of incense makes you feel humbler; the light, a special kind of lighting, makes you feel even more humble; the music too, when you listen, especially to the big organ at Notre Dame, you feel even more humble. That's to put you in a special state of mind where you can be manipulated. I don't want to discuss politics here, but they are playing on the different senses to put you in a position of inferiority.

PR – With Modernism there was a problem because the religious space was no longer symbolic, and so it began not to make you feel humble anymore. It becomes like a factory; you go inside and there is this place… In the end we wanted to stop this and just produce the perfume. It was the same as the cross of the body of Christ, but you go inside this odor. It was like disappearing inside Modernism, inside the symbolic aspect – you go inside the body, and you smell the odor of Christ. The formal aspect of the church becomes something that you breathe, but you are not going inside, you are drawn inside.

MR – There is still a question of one's upbringing when you smell something. If you give, let's say to an Eskimo, the smell of incense, they will have no reaction. You react to it because you have been trained by it since you were young. Like with soap, you are educated that its smell means clean, it's a question of upbringing.

PR – Here it was different. It was more about showing the limit of Modernism.

MR – The perfume *Pleasures* by Estée Lauder is a perfume that works in New York but not in Paris. I don't have a rational explanation; maybe it is because of the different cultural tastes. You have so many parameters. If I am supposed to work for a Spanish brief, I have to take Spanish taste into account. You cannot have an international style because it is impossible to please everybody. First the difference used to be more geographical, now it is more social. Increasingly, there is a social stratification where there could be more difference between a guy living in Paris and another in the south of France, than between someone in Paris and someone in Tokyo. Their spirit, their way of living, the products they might use – today they have more in common sociologically. You cannot define it precisely; you define it by experience. Just as you cannot always anticipate the effect of a raw material's structure. You always have surprises, and you are always obliged to experience them. The more you experience the more you know.

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Encounter 4

GIARDINO DEI SEMPLICI, FLORENCE – It is the third oldest botanical garden in the world. It was established in 1545 in response to Cosimo de' Medici's desire for a garden of medicinal plants. Over time it grew in value to the point of becoming a high-level cultural institution. Today it covers an area of 23,892 square meters with two types of greenhouses, noteworthy in size both in terms of area and of volume. The warm greenhouses host tropical plants, while cold one's host plants which require lower temperatures in order to grow. The medicinal plants grow outside. Of particular note are a European yew planted in 1720 and a huge oak from 1805.

CLINO TRINI CASTELLI – Design professional and theoretician, he was the first to study the emotional value of products in industrial applications. He has received two Compassi d'Oro and the IBD Gold Award. He is among the pioneers in design and architecture to explore the points of convergence between design and odors.

LORENZO VILLORESI – He is a perfumer known all over the world for his prestigious olfactory compositions. His interest in perfumes is nourished by extraordinary and heterogeneous cultural interests, such as that for ancient history or philosophy. He traveled extensively across Northern Africa and the Middle East before embarking on his professional career.

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LV – The spatial design of a perfume interests me well beyond the creation of products. Right now, we are designing a spinning top for children which should create a sort of "olfactotheque". The idea is to provide children with the opportunity to get better acquainted with and interact more with the universe of fragrances, both with smells they already know and with those they do not. So, we decided to build a solid in the shape of a truncated cone with icons and images of plants all around its circumference. The alternative would have been one with a geographical theme, but this would have had the same limit as the manuals; it would only have been able to accommodate a small part of the materials that are used.

Natural fragrances are only a small part of the world of odors, and they are practically the same ones that were used a hundred years ago. There are just over a hundred of them, whereas in perfumery we use thousands of scents.

Children's responses to odors are always extraordinary. Another experiment that we did with 3-to-5-year-olds was to prepare colored cards where each color corresponded to an odor, for example, the color orange corresponded to the essence of orange, yellow to lemon, violet to lavender, and so on for a total of ten different colors and essences. The reactions were very strong both emotionally and in terms of how well the kids remembered the different odors and colors.

CTC – My interest in the olfactory universe and odors also stems from color and a non-traditional approach to design. For example, in my vision of the osmic dimension, odor is inseparable from the medium that is a vehicle for it; air takes on an indispensable role and odor thus becomes an environmental character. When I began getting into these topics, I was wondering a lot about the nature of materials, which at that time interested me in all its facets: chromatic, tactile, olfactory. The immanent aspect, that is, the fact that an odor is associated with a substance, became more important for me than exploring the syntax of the fragrances.

I have always been interested in associating a perception with something objectifiable: the more a phenomenon is immaterial, the more I strangely feel the need for it to be connected to an objective medium. This is probably one of the differences between those who work with the emotional reality of things that have their own odor and those who work creating scented visions, pure perceptions.

This approach derives perhaps from my background as an industrial designer who has sought to bring an emotional dimension to the world of automobiles, electronics, and chemistry, starting from the dimen-

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sion of color. At the end of the seventies the advent of color sparked a great revolution in the history of designs which needed planning, for it entailed big investments. Today I see something similar happening in the osmic world and in that of taste, extraordinarily well embodied by the new enological culture. New generations are, as a matter of fact, committing to the development of the perception of very subtle aspects of taste, linked to the subjective experience. This phenomenon highlights the new centrality of the subjective experience, marking a historical turning point.

LV – Drawing a parallel between the industrial world and that of colors, we can look at what has happened in the fragrance industry regarding the distinction between natural and synthetic. "Natural" in biological terms regards something that is born and that dies, something that can be said to "live", that undergoes a biological growth process, such as a flower or a plant. However, "natural" in the sense of something "belonging to the world of nature" is a very different concept. In those terms, even petroleum is natural, but it is not something that can grow or that undergoes any sort of biological process of development. It is like a rock or a mineral. Now, as for the concept of synthesis or "synthetic", in relation to aromatic materials, the term can be applied to two different types of substances that have the same name. For example, linalool, the main constituent of lavender essential oil, can be obtained (isolated) from lavender oil or else synthesized from pinene and methyl-heptenone. In either case it is called "synthetic", while the "true" synthetic products are actually obtained from raw materials that are available in large quantities and at a low price, like, for example, petroleum, coal, and their derivatives.

A common belief we often hear is that natural raw materials cost more than their synthetic counterparts. But there are natural materials such as oranges or pine trees that cost much less than many synthetic substances. For example, the main constituent of the smell of freshly cut grass, an alcohol called cis-3-hexanol, costs much more than a lot of natural essences.

Natural ingredients, moreover, bring the charm of being associated with the earth, with nature, with the changing of the seasons, and of never being the same from one time to the next. So, the issue of the naturalness or not of aromatic substances is both technical and aesthetic.

At the same time, when I think of what we have managed to obtain through analyzing the constituents of natural materials and synthesizing them, I would not consider giving that up for a minute. You have

to understand that not only would we not have been able to recreate the fragrances of many beloved and famous plants or flowers such as grass, lily of the valley, honeysuckle, lilac, gardenia, magnolia, and many others, but the quantity of different olfactory notes available to perfumers would have also been very limited. In the letters and exchanges among perfumers in the late 1800s and early 1900s you understand that their main problem was the limited "alphabet" of odors at their disposal – they only had about a hundred almost completely natural ingredients until the end of the Nineteenth century.

CTC – Here I seem to recognize a parallel with the world of new materials. In design, the use of any material that imitates another is not appreciated. It is always better to choose the original. Hence, everything that is made synthetically just to cost less is generally looked at as a commercial expedient. Nevertheless, more or less the same thing happened when we went from artificial materials to synthetic materials, for example from Bakelite to plastics. In this case the interest was purely technological. Designers were the first to use plastic materials for their own autonomous qualities. Originally the new materials were imitative, substitutes, ersatz; now it isn't the case anymore. There always is a lot of interest in synthetic materials.

A synthetic product, when it is an imitation – whether in the world of perfumes or in that of materials – generally turns out to be crude, simple, not very complex. However, when it does not exist merely to be a substitute for something else, then amazing things are created. The colors created with alizarin come right to mind. Its synthesis led to color effects that had never been seen before. It was extraordinary, a great innovation.

LV – Synthetic substances mainly represent the availability of ingredients for creating different nuances in a composition, in any kind of perfume base. They aren't generally used as finished products; they are "ingredients" for the composition, not the composition itself.

CTC – But aren't there new synthetic products that don't resemble anything we know?

LV – In special synthesis processes under certain conditions and using special organic synthesis reactors we can obtain substances that do not exist in nature.

CTC – These are the areas that should be valorized, in which we should be investing. Think for example of the pigments that didn't exist naturally but that then turned out to have extraordinary qualities.

LV – Synthetic substances that do not exist naturally are used along with special compounds to achieve "special effects", to add something new,

something undecipherable and special to a given fragrance, not to imitate or reproduce something that already exists in nature.

CTC – Celluloid was a true imitation (a true surrogate) which worked in fact well in Italy at the time when combs were made of horn. However, in the world of material culture, new substances were well received and used rather intensively. Whereas I seem to understand that the seductive aim of perfumes in the world of fragrances somewhat inhibits the potential for innovation. While a color can in some way stir emotions or be seductive, or else be dynamic or basic, perfumes seem to be so strongly tethered to the emotional and seductive spheres that there is little room for innovation. I wonder if some fragrances could be produced which, even if they are not pleasant, could become iconic in a new way.

LV – It would be interesting to design odors as signals, as "signs", familiar or new odors that can distance themselves, where necessary, from pleasure and seduction. They would be "semaphore" odors, so to speak, which also have other functions without forgetting the need to renew or enhance the fragrance itself. "Pleasure" in the world of odors is now strongly linked to recognizability, hence to memory, to the database of odors we have in our heads – but not exclusively.

CTC – Is that because the osmic world is so strongly associated with certain spheres of emotions that it is overly subjective?

LV – Our tastes are inevitably personal. What we like or dislike depends greatly – beyond hereditary components that are hard to determine – on our experience with odors in the first years of our life. An odor associated with good experiences is "memorized" as being good and likewise for bad odors. Then there are odors, such as those of various toxic substances or substances that are harmful to our olfactory apparatus, such as ammonia, that may be considered – in their pure state – as being almost universally negative. But everything in the world of odors depends on the degree and the context. A given substance in its pure form may be repulsive, whereas if diluted a hundred times and combined with other substances it may seem extremely nice. As for substances that are truly unknown and "unlike" any others existing in nature, perhaps it would be appropriate to experiment further in order to empirically evaluate people's reactions to them in different proportions.

CTC – I once smelled an odor I had never smelled before. I was in a meat market in Mexico. The market was roofed but open-sided. It was clear that it was not kept very clean. Suddenly I caught a whiff of this indescribable sweetish smell. I took off like a crazy man! It was a reaction triggered more by instinct than by memory.

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LV – One of the main problems regarding a given environment that has yet to be completely resolved is not that of perfuming it but rather that of eliminating or changing its odor. It is not all that simple to permeate a space with a fragrance, especially if it is large or public. So, we can consider the opposite issue of perfuming a space to be crucial – the problem of how to change the odor of the air in a space still remains a substantially unresolved one.

CTC – Here we introduce another chapter, which is one about absence. In design, under the influence of Japanese culture, the existence of an odor may be reevaluated and worked with also in terms of its absence. In the mid-eighties I was invited by the Milan Triennale to an exhibition on habitation which included various designers and explored the themes of air, dust, and odors. My contribution had to do with the use of water, light, and gas in the house. The result was the *Camera Linda* [Clean Room]: a household storage room that was meant to take the place of cupboards and that used an electrical appliance/door which kept the room under slight pressure, removing any dust and odors from the air.

LV – It brings to mind Süskind's book *Perfume* when the protagonist has to leave the place of all odors, Paris, to go into an odor-free cave, a place completely lacking any odor.

CTC – We should work on bringing the rationale of design into the world of odors. It would be an experience similar to the one that led to the Slow Food movement for food.

LV – I agree. There are not enough interdisciplinary explorations and also too little research into new uses of perfumes and new ways of applying them.

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Encounter 5

LES ATELIERS HERMÈS, PARIS – It is the center of production for the French manufacturer of luxury leather articles. Founded as a saddle making company in 1837, Hermès now creates accessories, clothing and perfumes. The site was designed by Constantin Voyatzis and Rena Dumas with the concept of visible work, like a beehive or a Moroccan medina. Leatherworkers in the atelier handcraft each item from beginning to end, individually involved in all phases of sewing, embossing, waxing, assembly and finishing. Much of the creation is done without machinery and in certain ateliers the only sounds are those of metal hand tools on leather. There are six ateliers on the premises, each with about thirty workers.

HERVÉ ELLENA – He is a Paris based architect. His latest design was for the rehabilitation and extension of the *Institut de France* in Paris, and numerous projects for highway structures across France.

JEAN-CLAUDE ELLENA – He has been Hermès' in-house perfumer since 2004. Some of his previous major creations are *First* for Van Cleef & Arpels, three fragrances for Frederic Malle and Bulgari's *Eau de Thé Vert.* He has created two Hermès fragrances inspired by the garden: *Un Jardin en Méditerranée* and *Un Jardin sur le Nil,* and a collection called *Hermessence.* In 2006, he created the house's new masculine fragrance: *Terre d'Hermès.*

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[THE LOBBY]

HE – In architecture perfume is rarely thought about. Olfaction is associated with the dark side of architecture, with what people forget to plan, and the details that are overlooked when we think of how one lives in a place. Often these are the things that come about unconsciously. They are not in the plans or the details, but you feel them when you build, as well as on the construction site. Mostly it's intuition. Anyway, I'm aware of the smell of the building materials that I use, like wood, but maybe it's because I have this family history.

JCE – Architecture is the art of space and to measure the quality of a perfume, you measure its efficiency in space. When someone wears a perfume, you don't have to get close to smell it as the perfume occupies a space. This space is important in the expression of the perfume; the perfume is also an expression of the space. The first smell you have around here, as you enter this space, is leather. It's subtle – it comes from those armchairs over there – but it's present and Hermès is leather oriented, our work is about leather. When you create a perfume there is a way to structure a *formula*; you have components that structure the smell. Components are ornaments, details. You play with these ornaments and the structure; sometimes ornaments can become structure and sometimes structure can become an ornament. In this way there is a link with architecture. You can invent new structures all the time because the way to think in perfumery today is not to take a structure from the past, but to invent new ones.

In perfumery it takes five to ten years to be able to use a new element, and to understand how to handle it. When a new material comes, everyone is scared by it, but step by step they find a way to use it. But it's not like a new molecule arrives and one makes a new perfume. This is bullshit! *[Laughs]* That is just pr talk. Aldehydes were invented in 1904 and people started using them. In 1921, the invention of *Chanel No.5* got people talking about aldehydes, but in fact they had been using them for almost twenty years. We ought not to reduce perfumery to one new molecule, for you can take this molecule away and the fragrance will almost be the same. It's *Chanel No.5* that made aldehydes, and not the aldehydes that made *Chanel No.5.*

HE – The same goes for architecture: reinforced concrete was invented by a French, Joseph-Louis Lambot, and the first things he made with it were flowerpots and even small boats. He thought of things and just made them at his scale, taking steel and shaping concrete around it. But it took time for concrete to get to its true essence, to adapt it

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and imagine what could be done with it. The final use of a material is perhaps different from how it was originally conceived. The first use of new materials, even new techniques in architecture, is often ornamental.

JCE – It always takes a long time to adapt and to invent *the* way for a new material to be part of the story. I look at all the new materials, some I reject, others I keep, and out of my selection, perhaps there is a product that I will use in two, three or four years. I know they are there and when I have a new idea for a perfume, I remember one and say: "Oh, yes, this could be part of my story".

HE – It takes time to understand how to use simple things as well. I build mostly in wood, and it took me time to understand how it works and not to just put things on top of each other. But it is not written, you have to find a way through with each material.

[ATELIER 1]

JCE – The smell here is, of course, of leather, different kinds of leather; but there is also the smell of glue. All leathers have different smells, some are flowery, some are woody, others smell of varnish. It depends on the leather and the way they prepare it. Goat leather doesn't have the same smell as calfskin. I'm working on a series of perfumes based on leather, but I'm really taking my time because I want them to be right. The people working here get so used to the leather smell that they don't notice it anymore. But if somehow the place's odor were removed, people would say: "This is not our place".
So the olfactory information is still there, even if one is used to it.

HE – I used to work in a perfume factory when I was very young, and I noticed that it always had the same smell. Products would change – one day shampoo, another day perfume – but in the end the smell was always the same; it's called *mille fleurs*. I would get so used to the smell that I didn't notice it, but if I left the factory without taking a shower, my friends would say: "Oh, you smell of *cocotte!*".

[ATELIER 2]

HE – Here it smells of ironing, like in a laundry.

JCE – Here the odor is very different from the smell of the bag atelier, which smelled strongly of leather. Instead, here it smells of hot iron.

HE – You can see in the ateliers here that everyone takes care of the way bags in progress are displayed, and the way their tools are placed

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around them, but never in the same way. This is a part of architecture that no one sees. No one should think about this before workers arrive. You have to make the space as open as possible.

Here some tools or cabinets have no real place, they occupy unused space, it seems as if they could not find a natural place – or maybe this very place was lacking "naturalness".

This is a permanent issue in architecture – we should think about most things, but not too much, because we don't know how the people are going to work. Even if we wanted to know how they worked, we would be wrong. We must have some intuition about how people work in order to draw plans – to have an idea of the size, the shape and the scale of the place – but not to predetermine the placement of every object, because that would never work.

When you build something, you also change the surroundings. But the surroundings change the architecture in return. This is true at all scales.

When I've built things in the countryside, in the middle of France, it was mostly buildings for road services – garages, offices for highway maintenance. In these cases, the main architectural concern was the topography of the land, and wind direction. This meant getting in the right direction for the wind, because if you have a big garage with five-meter by-five doors, too much wind will blow the doors off. At the same time we would think about landscapes and vistas, as well as about the upcoming user, but once you've dealt with the engineering issue, then you can explore a range of questions: if you want to bury the building in the hill, or on the contrary, to overexpose it, and so on. The questioning stops only when the architect feels a resolution to the questions that have been posed. Architecture is overly concerned with how the building will be seen. If it's near a highway you might think you'll see the building only from the point of view of the traffic. Often a problem with builders and construction firms is that they say: "No one will ever see this, so why care?".

Architects must always fight, to say that the unseen is as important as the seen.

JCE – One of my theories is that if you make a perfume that is simple – it could be complex, but simple in how you smell it – people will be able to add something to it, hence turning it into their own perfume. If the perfume is very complex, and smells very complicated, it will only take a moment and you won't want to wear it because you'll feel like you aren't finding your place in the perfume. The wearer has to add something, but you cannot tell what it will be. One of my pleasures is

listening to people talk about my perfumes because there are plenty of stories built around them after they have added their own mind, their own thinking, their own emotions to them, and this is great and completely unpredicted, and it does work as evidence of what I've just said.

HE – In the big atrium in the lobby, when you see the big façade, you can see all the window ledges. The architect who made the building wanted it to be all glass, but as it is an atelier, people have tools and their things, so all the lower parts of the windows are a mess. Was the architect wrong? Should he have provided a closed off space where there was no glass?

JCE – It's a living effect. It's alive – you see all this mess, but mess equals life. It's very important to see that people are working, it's not a hospital. Mess is human.

HE – Some architects don't like this. They want to forbid everyone to place things on the windows. Others say, well, it's just life, you can't organize it. You can color the lower parts of the windows, to indicate that this part of the window is out of my control. People want to be in their own place, their universe. You could see that with workers who had pictures of their children and a few things that say this is their place and not someone else's. It's the same as with perfumes: architecture might be complex, but it needs to feel simple in order to make everyone's stories happen.

JCE – When I worked on the theme of gardens in perfumery, I would always take one thing, like fig which was the important element in *Un Jardin en Méditerranée, or* green mango which was the fundamental part of *Un Jardin sur le Nil*. This way, people can understand what I want to say. If there is one thing you can grasp, you will understand the story right away and you will be able to follow it. If I put too many things you won't see what I want to say anymore, it is boring and it doesn't work. This is a rule.

HE – In architecture, would you be able to conceive a garden-like building and, if so, would it be a French garden? Or would it be an English garden? Maybe modern architecture is too much like a French garden – too structured, too much about getting things right. Maybe a workplace should be more like an English garden, where people can go any way, they want. An English Garden is not just scattered seeds; it is organized, but without being showy like in French gardens. You know that you will see that tree from the entrance. It will look like it is natural, but it is not natural. It's not a question of geometry, but more of the way you walk inside the garden, like in Chinese or Japanese gardens.

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JCE – If you wish to feel valued, if you want success, then you have to show something important and then let people add things. You put something in evidence, and then you open it up – that way people will go there and play. But the idea is not to try and say everything. Virtuosity should be perfectly organized – between the seen and unseen, the said and unsaid, in order to make the picture revealed.

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Architects and designers Anna Barbara and Anthony Perliss dig deep into the unexplored, yet profound, relation between place and smell. How does the odour of a space, of a building, influence our perception of it? Moreover, how does said olfactory experience alter our very behaviour and understating of place?

Tracing back the history of smell and architecture throughout cultures and centuries, *Invisible Architecture* is a groundbreaking exploration of the most invisible and overlooked of our senses, and its seemingly infinite applications in the world of design and architecture.

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