

Redefining Waste for the Twenty-first Century: A new role for interior designers

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ABSTRACT

The notions about waste developed over centuries have had a significant impact on the way we relate to it. The transfer of responsibility for waste disposal from the individual to the public, the notion of disposability arising out of the need for sanitation and the rise of environmental awareness have contributed to the creation of waste as a 'problem'. Resignation and guilt, the impulse to treat our waste as invisible or with disgust, the inability to acknowledge the normalcy of waste, these are some of the outcomes with which we live.

Rather than implementing further problem-solving actions, which have up till now returned limited results, a transformation of individual relationships to waste is required, leading to new ways of viewing and handling what we must discard. The practice of design has expanded its scope from being governed by market forces to impacting social change. Interior designers can contribute to this paradigm shift, borrowing from the principles of persuasive design to include designed spaces for waste management in urban homes in order to empower individual responsibility while diverting significant quantities of waste from the waste stream. Eventually, waste management can gain a permanent space within urban homes, thereby legitimising the existence of waste, acknowledging individual connections to its substance and embracing ownership of management.

RUBBISH MEMORIES

My relationship to both waste and kitchen design is inextricably linked to a childhood spent in Mumbai, a bustling Indian metropolis. In that milieu, the way we viewed waste, while complex, multifarious and problematic, was distinct in context from what I encountered in the United States, the only other country in which I spent a significant quantity of time. There is no single story about waste.

I grew up on the thirteenth floor of a twenty-two-storey structure that is one of Mumbai's earliest skyscrapers. Each floor had three apartments, three elevators and a small-door access to a vertical garbage chute. People could literally throw the contents of their bins down the chute and each morning the garbage truck would come around to collect the mess from a room at the bottom into which the chute fed. There were often notices sent around to the houses requesting that broken glass and other potentially dangerous objects be secured in an extra bag. In addition, people would also throw rubbish out of their windows occasionally, prompting those in the know to rush through the entrance to avoid being hit by messy and often dangerous projectiles.

While we lived in a wealthy neighbourhood, my father had recently retired from the army and we were not ourselves wealthy. We had moved from living in bungalows with large gardens in small towns and cantonment areas to an apartment in a high-rise in a densely populated city. My parents brought with them practices of frugality and civic-mindedness that came from living in smaller, less anonymous communities. They often expressed disgust at the prevalent practices and I was in trouble when, at age seven, succumbing to curiosity, I tossed a tomato out of our thirteenth-floor window so that I could see it land. My mother always threw tealeaves and eggshells in the potted plants though she did not attempt a full composting in our three- by ten-foot balcony. She also regularly washed and collected the metal tops of milk bottle caps from the morning milk, scraps of foil from medicine strips, cans and food packets. All newspapers, magazines and glass bottles were also stored once their usefulness had passed. Every month or so, a scrap merchant or would come door-to-door asking for scrap and paper. He would count the bottles and weigh the paper and metal. After the traditional haggling over a rate he would pay us for our junk, load it on to his cart, and leave. If we had any unclassifiable items, it was always worth asking if he would take them; over the years we divested ourselves of old records, long defunct transistor radios, a bicycle wheel, broken metal pans and innumerable unpaired metal locks and keys. Many items had value because repair was much cheaper than a new purchase. Sometimes the trader would offer a barter rather than cash. This usually took the form of stainless steel vessels and dishes that people commonly used for daily cooking and eating.

We took this recycling micro-industry for granted. There was a strong antipathy to throwing anything away, born in part from a native thrift but also in a national atmosphere of poverty and need. We stored and valued the waste because it was worth a monetary or material return. In our posh neighbourhood, we were the exception rather than the rule however; being wealthy was synonymous with the ability to discard with impunity.

Over the years, the glass milk bottles gave way to plastic bags, which were also rinsed and collected, to be sold by weight. We hadn't many other plastic bags. Bread and eggs were sold at our door and came unpackaged or wrapped in a small square of brown paper, just enough for the vendor to hand over the bread without touching it. Clothes and non-perishable items from larger stores came in thick plastic or cloth bags that my mother would store flat between the bed and the mattress.

These would emerge in pristine condition when the need for a bag arose. It would have been foolish to go grocery shopping without bags. Most roadside vegetable vendors were subsistence farmers, too poor to offer bags with their products. Everyone carried their own reusable cloth or canvas grocery bags to the market.

I don't know when the changes occurred but in college I remember preferring the new plastic chip bags because the contents were less likely to be rancid. Glass soft drink bottles gave way to plastic and we all reckoned those were cleaner, safer and more efficient. I couldn't understand my parents' inability to throw out old radios and phones: they could not adjust their notion of value to encompass objects whose pristine physical appearance belied their true uselessness. Once I left home, visits would regularly involve haranguing my parents for being hoarders of junk. They couldn't listen and they still don't, and here I am several decades later, trying to reframe those early lessons, so this common wisdom can become part of our twenty-first century practices.

Waste is chaos, cleanliness is order. The nature of the home is to be a refuge from the uncertainty and chaos of the world, to be somewhere that is entirely one's own. Waste threatens the order. If the processes around its management are acknowledged and granted space, that would make visible the unpleasant, ugly, chaos-creating aspects of our human existence. Because our associations with waste are unequivocally negative – both with regard to its physical presence as well as the modern implication of being wasteful – it is difficult to devise solutions to waste disposal and management free of the accumulated baggage of guilt, resignation, fear and frustration associated with global pollution and over-population. The framing of actions within these old paradigms will only lead to new versions of older solutions, fraught with the same associations. What is required is a new set of parameters and design considerations that can result in effective synchronous solutions that meet the needs of current and future homes.

A NOTE ON THE USE OF TERMS

We have many words for describing the pervasive by-product of human civilisation: waste, trash, garbage, refuse, rubbish, scrap, discards are some of the commonly used terms around the English-speaking world. To these could be added words with slightly more specific meanings: junk, debris, litter and detritus. The official term for all these forms of waste is solid waste. William Rathje clarifies that while these terms are often used synonymously they have distinct meanings. While garbage is usually made up of 'wet' discards such as food remains, yard waste and offal, trash describes paper, cans and 'dry' discards. Refuse collectively includes both wet and dry discards and rubbish describes all refuse as well as construction and demolition debris.¹ To this collection I add the term dirt, which refers specifically to soil, or collectively to all things that possess the property 'dirty'. Filth and its various synonyms are more automatically loaded with negative connotations of offensiveness, uncleanness and impurity.

An etymological study is outside the scope of this paper. While I will be using the word 'waste' in most instances, I intend it as a collective term that refers to all solid waste generated. In addition, I use different terms interchangeably to describe waste.

THE CREATION OF A PROBLEM

The modern environmental movement began with protests against rapid industrial expansion and the corresponding pollution. Nature was the passive helpless victim of the forces of industry, defiled by exploitation and greed. Industry and the forces of capitalism were distinct from the people, the true protectors of the earth. Vance Packard's 1963 classic, *The Waste Makers* was the first real indictment of consumerism and its contribution to the creation of waste.² While mainstream environmentalism was directed at saving nature from industry, Packard focused on the wasteful buying practices of the individual consumer. Although he accused industry of 'planned obsolescence' and promoting a 'throwaway culture', his work focused attention upon the individual's responsibility for waste generation. While he helped to create awareness about the negative aspects of disposability, Packard also created a moral stance from which to view waste. Waste became the consequence of the shallow status-seeking habits of consumerism. Not only was it wrong to waste, but the physicality of waste served as a troubling reminder of moral turpitude. Often used in the media to describe doomsday scenarios, images of vast landfills became symbols of a garbage crisis, spurring demonstrations and public protest. Waste thus entered the public space as a problem, but in the private space of the home, it was still invisible.

We want our waste to disappear, easily, like magic. A sanitary worker once said of the public view, 'People think there's a garbage fairy. You put your trash on the curb, and then *pfffft*, its gone. They don't have a clue.'³ Not only do we not want to know what happens to our waste, its very ability to disappear is the experience we seek. While creating waste is guilt-ridden and problematic, its materiality is imbued with the issues of hygiene, sanitation and disgust. In *Purity And Danger* (1978) Mary Douglas asserts that modern society differs from primitive society in two notable ways in its notions of dirt avoidance – for the modern world, dirt avoidance is inseparable from notions of hygiene or aesthetics as opposed to religion or ritual and second, that the re-imagining of dirt in terms of the bacterial transmission of disease since the nineteenth century makes it difficult for modern society to think of it in other terms.⁴ However she goes on to say, 'If we can abstract pathogenicity and hygiene from our notion of dirt, we are left with the old definition of dirt as matter out of place. This is a very suggestive approach. It implies two conditions: a set of ordered relations and a contravention of that order. Dirt is then never a unique, isolated event. Where there is dirt there is a system.'⁵

The many nuances of meaning that waste matter acquired historically were not entirely replaced by the notions of hygiene and pathogenicity. When order is represented by cleanliness and beauty,

refuse represents not just the danger of germs and disease, but also the added connotation of impurity, uncleanness, decay and chaos. The new scientific evidence provided logical justifications for the 'ordering and classification' of ingrained cultural systems. Douglas suggests that the existence of dirt dislodges order, 'eliminating it is not a negative movement but a positive effort to organise the environment.'⁶ This corresponds with the systems of waste disposal that support invisibility; whose intention is the creation and maintenance of cleanliness and order rather than the responsible management of waste.

Since the latter half of the twentieth century, urban individuals have reconnected to practices of recycling and reuse in the wake of environmental awareness. However these practices are distinct in character from their prior incarnations. Up until the mid-twentieth century, a large quantity of domestic material was recycled and repurposed both within and outside the house, as is still common in many developing countries. The significant low-income population in cities ensured that a large industry also thrived on the salvage, repair and recycling of objects supported by scavengers and rag pickers who were an essential part of the system.⁷ However, much of the process of recycling and reuse included the careful maintenance and preservation of objects so that they would retain value in exchange and barter. For example, bottles were washed and refilled; old clothes were mended and sold and odds and ends of metal were bartered. The contemporary urban form of recycling is a more centralised and regulated activity. Concerns about hygiene and disposability have had an effect on what Strasser refers to as a change in the stewardship of objects.⁸ Objects that enter the waste stream are seldom reused as they are, for the same reason that no one would buy a food product in a reused glass bottle. In order to make a transition from waste to being re-valued, objects today must undergo a transformation to an unrecognisable state; only then can we accept them. So current practices involve destroying objects; PET bottles must be crushed underfoot, glass bottles must be broken, and paper boxes flattened. Recycled objects bear no resemblance to their raw materials – PET bottles become carpet backing and grocery bags, old glass goes into countertop materials and as aggregate for concrete. While

an object's recycled content is considered a desirable quality, people do not wish to be reminded of what waste objects went into its production.

Our trash has a unique characteristic: it is entirely composed of things that used to have value for us in the immediate past. Whether it is vegetable peels or plastic packaging it is our connection to these things that transforms their nature from valuable to worthless. Once these things enter the bin they become undistinguished from the rest of its contents, described by a collective noun – trash, rubbish, garbage, waste. It is easy to comprehend the transformation of organic matter, which undergoes physical transformations in taste, appearance and smell, traversing the continuum from fresh, wholesome and appealing to wilted, odorous and decaying. We understand our rejection because this fits within our organisation of the environment. However, when we contemplate a polystyrene cup this notion becomes more complex. Ostensibly we acquire it for its function as the vessel in which to contain a liquid. The particular disposable nature of its material, however, is based on two entirely distinct functions; for its convenience, in that we are saved the time of washing it, and for the safety of sanitation it provides. According to Kennedy, we have always valued objects for their function. What has changed is the ability of modern commodities to depart from their function at our will and to take on symbolic values.⁹ When consumption (finishing the beverage) removes the value of the cup for us, the commodity as such no longer remains intact. However there is the troubling fact that there is no change in the physical state of the cup. The act of throwing it in the bin is what changes its state to trash.

The polystyrene cup is already and always disposable without any intrinsic value. We cannot comprehend its return to dust because as a plastic we know it will continue to exist long after we are gone. Yet, it has irretrievably lost the ability to provide hygiene. By being both immutable and forever trash it becomes 'not just matter out of place but matter without place.'¹⁰ The promise of the modern age, which was to make us carefree through the freedom of convenience and health, instead makes us careless, or unable to care for things. The quality of disposability then

attempts to make trash absolute, negating the essential relativity of matter. We live uneasily with this contradiction and attempt to escape the dilemma through invisibility. Homes are designed to eliminate waste matter as unobtrusively as possible; kitchens are constructed with no physical acknowledgment of the existence of waste matter. The trashcan occupies a temporary position in most kitchens; by not having a designated space it strengthens its excluded status in the kitchen. Whatever it contains is due for elimination, and is already metaphorically rejected.

Mired amongst the complex emotional reactions we have to waste exists a certain core truth: the discarding of things defines us. Hawkins calls it 'the binary of waste and human.'¹¹ What we divest ourselves of defines us by its absence, even more than what we acquire. Waste constitutes self in the habits and embodied practices through which we decide what is connected to us and what is not.¹² We determine and formulate our sensual relationship with the world through the ethical and aesthetic organisation of our surroundings, and it is imperative in the preservation of our notional self that we dispose of what does not fit our self-image. In an essay, *La Poubelle Agréée*, Italo Calvino, describes the transfer of trash from his kitchen container to the larger one on the street: '[T]hrough this daily gesture I confirm the need to separate myself from a part of what was once mine, the slough or chrysalis or squeezed lemon of living, so that its substance might remain, so that tomorrow I can identify completely (without residues) with what I am and have.'¹³ Calvino describes an experience common to each of us, the satisfaction of restoring order to our environment, of sloughing away what does not represent us, to emerge renewed. Hawkins comments upon the absence of guilt in Calvino's narrative and the pleasure he takes in the ritual purification of putting out the garbage.¹⁴ In an era of blame and guilt-ridden accounts about garbage, Calvino's insights are a rare glimpse into other possible ways of viewing our waste that are not circumscribed by morality. When all forms of waste collectively represent a movement towards environmental destruction, individual acts of disposal are also loaded with these symbolisms. Contemporary waste habits have been permeated with a sense of obligation to particular rules and moral codes. Education around waste management is

centred upon doing the right thing, on being a good citizen, on the moral obligation to reduce consumption.

Among the various symbolisms that waste attains in the modern world – moral degradation, excess, urban blight, habitus, retribution for consumerism – it has been granted no dimensions of its own.¹⁵ It is forever a consequence of urban society, a disease, the cure for which has not yet been found. These conversations do not empower people to take action. Instead they entrench resignation. In order to develop new and empowering relationships to waste we need to describe it in different terms. Instead of the fallout of excess, if waste is the legitimate product of a technologically advanced society then we have an opportunity to create a different reality about it. It ceases to be a crisis and becomes a diverse product with specific needs. The management of waste – producing, managing, sorting, storing, collecting, organising, processing and recovering – is an integral and expanding element of modern society and is entitled to as much recognition as other industries. Contemporary society may organise its waste differently from the past, but this cannot lead to the assumption that contemporary citizens are more callous and uncaring of the consequences than their predecessors.¹⁶

In attacking modern practices without historical perspective we forget that certain disdained concepts, like disposability, were created for a reason. Low mortality and better health were achieved because disposability assured safety from contamination. In addition, the technological advances that we blame for our waste problems were created to solve waste problems of earlier societies so completely that those former components of garbage do not even exist in the collective memory.¹⁷ The automobile relieved cities of massive quantities of horse manure and smell. For instance, at the turn of the century, New York had 130,000 horses, each of whom produced 15-35 pounds of manure daily and about a quart of urine, all of which ended up on the streets.¹⁸ Along with manure we have also forgotten the thousands of pounds of coal ash that were generated by furnaces every year and the mountains of wasted food that spoil with no refrigeration and inadequate packaging.

Human beings have always generated waste; acknowledging this allows authentic and rational debate about how waste can be socially valued. As O'Brien asserts, all societies, not just the present 'consumer' version, are 'throwaway societies.'¹⁹ Instead of unfavourable comparisons to the past we can be engaged in developing ways to establish practices that make our waste material useful and eventually, perhaps even beneficial.

THE ROLE OF DESIGN

A study conducted on the characteristics of interior designers who practice environmentally sustainable design, revealed that residential designers were the least likely to consider sustainable interior design important.²⁰ Attributed in part to the small size and budget of residential projects, this trend also reveals that designers seem to consider the environmental impact of homes to be of low priority compared to the corresponding impact of the commercial and industrial sectors. In addition, while environmental standards are regulated by code for commercial and industrial structures, demand for energy efficiency and 'green' products in residential design is driven entirely by client awareness and willingness. Those designers who practice sustainable design often lack adequate information regarding the efficacy of their actions and the products they specify, or they are constrained by values of market economy to provide solutions that uphold economy over environmental sustainability. In effect, there is 'a sustainability gap' that exists between the principles of sustainable design and the realities of practice.²¹

The current scenario indicates that interior designers experience being hampered in environmentally sustainable practice by values oriented to growth and profit and a dearth of knowledge and awareness of environmental needs. Stieg proposes that instead designers should consider redesigning the design process itself to be compatible with natural systems that support regeneration of renewable materials, continual reuse of non-renewable resources and slower rates of consumption.²² The 'power of design' can be harnessed to eliminate concepts like 'waste' that have problematic baggage; creating new processes by which environmental sustainability can be streamlined into existing lifestyles.²³ Beyond explicit practical functions, design also has implicit social functions: the production and reinforcement of cultural meanings in everyday life through products and advertising is well known. Designed spaces have the power to create cultural realities, just as products become symbols that people use to communicate with each other. When designers develop an ethic to help them evaluate designs based on whether they empower or disable consumers, they enter the realm of social responsibility.²⁴ Social design then aims to place the design process at the service of the community of users, rather than market forces.

BORROWING FROM RELATED DISCIPLINES

The idea of promoting sustainable user behaviour has been widely discussed in the area of product design. Lilley, Lofthouse and Bhamra identified three strategies to reduce unsustainable behaviour

through product design: *eco-feedback* aims to inform users of the impact of their behaviour, hoping to induce desirable environmentally-responsible behaviours; *scripts and behavioural steering* make unwanted behaviour difficult while sustainable behaviour is made easy or automatic and *forced-functionality* circumvents users' decision-making process by transferring the decision-making to the product.²⁵ They noted that attempts to influence behaviour through education and raising awareness had little effect in creating sustained changes in behaviour, while products already subconsciously influence behaviour through persuasive advertising.²⁶ They suggested the integration of disablers and enablers to promote positive patterns of behaviour and reduce negative patterns in the use of the product. The concept of 'Design with Intent' (Dwl) thinking, where a strategic design is intended to result in certain user behaviour, brings the designer into focus.²⁷ The intent of the design is attributed to the designer and acknowledges the designer's aim more authentically. In the pursuit of making the user more efficient, the Dwl approach uses two conceptual frameworks: the use of *affordances*, *constraints* and *mistake-proofing* developed by Donald Norman and the idea of *persuading* the user rather than forcing them to conform to the behaviour change intended. 'Persuasive technology' was developed by Fogg (2003) in the context of website and software design but has significant potential for application in ecodesign and sustainable engineering.²⁸ *Feedback*, giving users an indication of the efficiency of their behaviour, is considered a key element of persuasive approaches.

Design approaches to promoting sustainable user behaviour have gained momentum in product design as the flaws in existing systems become more evident. Traditional eco-design is under the direct control of the manufacturer and focuses strongly on the marketability of the product and its supply. The way users interact with the product, however, strongly influences its environmental impact. The persuasive approach considers the life-cycle costs of products and has the potential over time and through reinforcement, to create an environmentally sustainable shift in user habits.

PROMOTING SUSTAINABLE BEHAVIOUR THROUGH INTERIOR DESIGN

Architecture and urban planning have always been able to promote certain behaviours through physical constraints and guides as well as the use of cultural motifs. Sustainable behaviour can be promoted through designing mixed-use facilities or walkable communities. However, environmental sustainability in the field of interior design has traditionally been expressed in the use of materials that are recyclable or have recycled content, specifying appliances that save energy and the appropriate use of fenestration for optimum daylighting and ventilation. It has taken an essentially passive role with regard to promoting behaviours through the design of interior spaces. I suggest that interior design can apply social design frameworks to the design of waste management spaces in urban homes, thereby promoting sustainability through the usage of the space.

Donald Norman provides a context for thinking about the design world and human behaviour. His principles of understandability and usability provide a framework for designing and evaluating the

objects of daily life.²⁹ *Affordances* refer to the perceived and actual properties of the thing, primarily those fundamental properties that determine how the thing can be used.³⁰ Norman describes various behaviour-shaping constraints that can prevent some activities while facilitating others in order to shape affordances. There are three types of behavioural constraints – physical, logical and cultural. Norman goes on to differentiate:

Physical constraints make some actions impossible: there is no way to ignore them. Logical and cultural constraints are weaker in the sense that they can be violated or ignored, but they act as valuable aids to navigating the unknowns and complexities of everyday life. As a result, they are powerful tools for the designer. A convention is a cultural constraint, one that has evolved over time. Conventions are not arbitrary: they evolve; they require a community of practice. They are slow to be adopted, and once adopted, slow to go away. So although the word implies voluntary choice, the reality is that they are real constraints upon our behaviour.³¹

Using this principle in the context of waste management, while the need to preserve hygiene and cleanliness are logical constraints and guide the user's actions, the notions of impurity and class are purely cultural and often lead to unconscious actions. However, as Norman asserts, to ignore the constraints of culture is to ignore very real constraints. A designer must comprehend the user's desire for separation between clean and dirty, even if it is notional; the need for thresholds that preserve the order and contain the chaos. Finally, in order for a design to be effective it must provide powerful visual clues to its working. Users must be able to form a conceptual model of the design that will allow them to predict the effect of their actions. In a good conceptual model the relationship between the actions the user must perform and the results to be produced are logical. Their subsequent interaction with the designed object will confirm their mental model, thus promoting repeat use.³²

A CASE FOR HOUSEHOLD WASTE MANAGEMENT

Urban individuals have not been required to manage their own waste for at least a hundred years. It is logical that urban homes lack the designed spaces to perform the range of tasks that constitute waste management. There is a gap between what is demanded of citizens and what they can accomplish and this gap has been maintained in part by legacy notions of waste and the conflicts with hygiene. It has also been maintained by the reliance on public waste collection systems. In order for individuals to have sustainable processes for managing waste they must be physically able to perform these tasks. Studies show that one of the dominant reasons why people either never begin or give up composting and recycling, is convenience.³³ Either there is no space to store recyclables or waste materials, or the pick-up services fluctuate or there is too much sorting required by the city regulations. A 2003 study on the residential implications of consumers' recycling behaviour concluded that it was essential to provide an environment that supported recycling; well-designed spaces have a direct impact on the quantity and accuracy of recycling (Macy and Thompson).³⁴

I suggest that kitchen space design is a crucial enabler in orienting individuals towards accepting their own waste and confronting the quantities we generate. Activities in the kitchen are legitimised by the existence of their processes. The provision for stoves, fridges and sinks sanctions the actions of heating, preservation, cooling and washing. The low importance of waste is codified by its essential absence in the kitchen. This contradicts the news about garbage crises and essentially creates a schism between private and public life. Applying the framework of persuasive design requires that the designer create designs that persuade people towards these activities. In addition, this offers opportunities for diverting organic matter and recyclables from the waste stream; individuals are empowered to deal with the global issue at a personal level and experience making an impact through their efforts. In the act of creating a space for waste and making the process visible, the creation of waste is validated, acknowledged and eventually normalised. The design must empower individuals at two levels: first, they experience being responsible for the waste they generate in its actual volumes and composition; second, they experience autonomy as citizens in being able to participate in the effective diversion of waste. The design must also acknowledge and address the conflicts inherent in dealing with waste. The notions discussed earlier have a powerful hold on the experience of dealing with waste and fit the framework of cultural constraints. To ignore them is to produce ineffective design.

The diversion of waste from the waste stream uses recycling, reusing, and composting practices. A study on composting behaviour revealed that avid recyclers were more likely to compost.³⁵ While recycling is a relatively simple process and requires mainly sorting space and the use of a sink for rinsing bottles and cans, composting presents many more challenges and is loaded with a reputation for being dirty, disgusting and smelly. To create a space for composting processes indoors would require that these issues were handled satisfactorily. Attempts to sanitise and make aesthetic the process of composting tend to ignore some important issues: the transformation of organic matter is part of a cyclical process of life, death and renewal. The problems of disposability may be counteracted by evidence of renewal in composting. For many people without backyards or gardens, not only is composting indoors challenging, but the end-product has no logical place in the home and must still be transported elsewhere. I suggest that composting systems require the inclusion of plants in order for individuals to have a place to deposit compost. Participation in the cycle of renewal will have additional benefits if edible plants are included. This transformation of waste from trash to food can contribute to people's experience of autonomy. Since space is always limited in urban areas, vertical green spaces may provide a solution and in addition, contribute to indoor environmental quality.

There are two sides to this story. Human consumption of natural resources has increased dramatically over the course of the twentieth century. As population increases make the implementation of new policies challenging, both increased consumption and corresponding increases in the quantity of waste generated have occasioned warnings from regulating bodies about the need to change lifestyles in order to preserve the viability of the planet for future generations. *Agenda 21* was the

United Nations' first comprehensive plan of action to combat the global human impact on the environment. This document recommended the implementation of long-term plans to minimise waste, promote reuses and recycling of materials and local or backyard composting of organic matter.³⁶

The other side is that human beings have always generated waste; in order to maintain the boundaries of what constitutes self, we must continue to discard. A fundamental aspect of our relationship to the world around us is our struggle between wanting to belong and needing to differentiate ourselves as unique. The very real concerns of growing and untenable quantities of garbage must be dealt with at a global level. However, making waste segregation at source practical and viable will also make a significant contribution to sustainable change. A vision worth pursuing is one of autonomous citizens who are both able and willing to take responsibility for their waste; who feel empowered in their ability to make a difference in the matter of waste. Appropriate residential design that includes spaces and processes for waste management is a step in that direction.

NOTES

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