



# LEGOified

## Building Blocks as Media

---

Edited by Nicholas Taylor & Chris Ingraham



B L O O M S B U R Y

# LEGOified

Building Blocks as Media

**EDITED BY  
NICHOLAS TAYLOR AND  
CHRIS INGRAHAM**

BLOOMSBURY ACADEMIC  
NEW YORK • LONDON • OXFORD • NEW DELHI • SYDNEY

BLOOMSBURY ACADEMIC  
Bloomsbury Publishing Inc  
1385 Broadway, New York, NY 10018, USA  
50 Bedford Square, London, WC1B 3DP, UK

BLOOMSBURY, BLOOMSBURY ACADEMIC and the Diana logo are trademarks of  
Bloomsbury Publishing Plc

First published in the United States of America 2020

Volume Editor's Part of the Work © Nicholas Taylor and Chris Ingraham

Each chapter © of Contributors

For legal purposes the Acknowledgments on p. vii constitute an extension  
of this copyright page.

Cover image © Nathan Sawaya and Dean West

All rights reserved. No part of this publication may be reproduced or transmitted  
in any form or by any means, electronic or mechanical, including photocopying,  
recording, or any information storage or retrieval system, without prior  
permission in writing from the publishers.

Bloomsbury Publishing Inc does not have any control over, or responsibility for, any  
third-party websites referred to or in this book. All internet addresses given in this  
book were correct at the time of going to press. The author and publisher regret  
any inconvenience caused if addresses have changed or sites have ceased to  
exist, but can accept no responsibility for any such changes.

Library of Congress Cataloging-in-Publication Data

ISBN: HB: 978-1-5013-5404-5  
ePDF: 978-1-5013-5406-9  
eBook: 978-1-5013-5405-2

Typeset by Deanta Global Publishing Services, Chennai, India

To find out more about our authors and books visit [www.bloomsbury.com](http://www.bloomsbury.com)  
and sign up for our newsletters.

# 5

## Fake Plastic Trees

*Chris Ingraham*

In the second decade of the millennium, after over sixty years of making plastic bricks, LEGO began rolling out public-facing initiatives to be more ecologically responsible. For the world's largest manufacturer of plastic toys, the grim realities of climate change could no longer be ignored. In 2013, the LEGO Group signed a "Climate Savers" partnership with the World Wildlife Fund (WWF), naming targets for the development of sustainable materials. Two years later, in spring 2015, the partners agreed upon a new collaboration to assess the environmental impact and sustainability of plant-based materials for LEGO elements and packaging. Two years after that, in June 2017, LEGO and WWF extended their collaboration again, this time emphasizing the reduction of carbon emissions in manufacturing. Though accompanied by optimistic fanfare in the popular press, these initiatives also underscored a brewing identity crisis for LEGO. How could a company whose eponymous product was made of synthetic plastic—the veritable icon of human negligence to the environment—become truly sustainable without also becoming something fundamentally different? LEGO, it seemed, had a LEGO problem.

In this chapter, I consider the history of LEGO's relationship to its materials, and the ways it has navigated that relationship in light of its long-standing commitments to austerity and more recent commitments to the environment. My aim is not to critique the LEGO Group's environmentalism or the effectiveness of its efforts at carbon reduction. That work has already been done and early verdicts are not especially flattering (George and McKay 2018). But the company does seem to be trying in earnest, and on many fronts,

however unwilling it may be to give up on plastics altogether. What's interesting to me rather is how their efforts to be more sustainable have emphasized plants, and plant-based plastics, as the change that will make a difference for the environment, while nevertheless insisting that, in the bricks themselves, the change should not be noticeable at all. This reverses the usual reasoning around "hyperobjects" like global warming, which maintains that things of such a massive scale can't possibly be seen or conceived except locally and therefore in such a partial way as to enable no wholistic sense of their enormity and complexity (Morton 2013). With plant-based LEGO bricks, however, we're given to suppose the opposite. As LEGO would have it, to hold a tiny sustainable LEGO brick in your hand should reveal no change whatsoever relative to prior bricks, whereas the larger process of their production, which of course most of us don't see, is where the meaningful environmental change is held to occur.

The most significant of the LEGO Group's recent sustainability initiatives was undoubtedly the 2015 announcement of the goal to use 100 percent sustainable materials in all their bricks and packaging by 2030. It seemed ambitious. But then in April 2018, LEGO announced that they could do even better: their new goal was for 100 percent sustainable packaging by 2025. If successful, none of its packaging would ever again have to end up in a landfill because it would all be recyclable (Gherasim 2018). To do the same for its bricks, however, posed a considerably trickier problem. It's one thing to change a product's packaging, another to change the product itself. Here again, though, progress was being made. Around the same time as the sanguine announcement of the expedited schedule for their packaging goals, the LEGO Group also announced that they had begun production on their first range of sustainable LEGO elements made from plant-based plastic—instead of the petroleum-based plastic that had long been their status quo. In a gesture widely taken as symbolic, the first plant-based pieces would be "botanical elements" such as trees, shrubs, and leaves.

In the same way that LEGO is the world's biggest tire manufacturer by measure of units produced—the company makes 700 million tires annually (BBC News 2018)—it is also one of the largest makers of artificial plants. Trees and bushes have featured in LEGO sets going back to the 1950s (Figure 5.1). What the release of plant-based elements meant, then, was not that LEGO was suddenly in the business of making artificial plants, which had long been the case. It rather meant that LEGO would be making *plants from plants*. Indeed, "Plants from Plants" was the first sustainable set's official name when it shipped in August 2018 with twenty-five pieces. Far from merely symbolic, though, I argue that by making the "Plants from Plants" set its first attempt to produce more sustainable elements, the LEGO Group revealed



**FIGURE 5.1** LEGO Set #230, “Trees and Bushes,” 1958. Image Credit: Brickset.com.

their belief that sustainability could be an engineering problem—and, in doing so, demonstrated the backwardness of separating nature and culture. To make this case will require understanding more about synthetic plastics, the history of artificial plants, and the material history of LEGO itself.

## LEGO and Its Materials

LEGO as we know it was born from austerity. In Denmark, 1916, a carpenter named Ole Kirk Christiansen started a business building houses and furniture. And all was well—until the depression hit, forcing him to downsize his production line and make more modest appliances like stools and ironing boards instead. Times were tight. With no choice but to be resourceful, he used his leftover materials to make wooden toys and playthings on the side. By 1934, these thrifty byproducts of necessity had become his primary product, and Christiansen changed the company name to LEGO: short for

the Danish, *leg godt*, meaning “play well.” Only later did anyone realize that “lego,” in Latin, also means “I put together.”

Initially, the wooden toys Ole Kirk produced were mid-sized products that came already assembled: ducks with wheels, train sets, trucks, yo-yos. These toys had some of the idiosyncrasies of woodworking, which, by involving different grains or knots in the materials, made these first LEGO products feel more authentic and personal. Made directly from an identifiable natural material, even now these wooden toys have a timelessness about them, a substantive quality that makes them immediately familiar, as if hard to conceive of a time when they didn’t or would no longer exist. But the LEGO company stopped producing wooden products in 1960, after a February 4 lightning storm struck their storage facility for wooden toys and sent its inventory up in flames. This was the third time their storehouse had been burned down since 1924 (Blakemore 2018). Wood, it finally became clear, was just too destructible.

In other words, while wood had revealed itself to be a useful material, according to the principles of austerity wrought by the economic depression of the 1930s, its vulnerability to fire revealed it later to be too decadent. Wood was a valuable material to the extent it could be used in full: an entire stock of wood could be put to maximal use when even the scraps left behind from the manufacture of other products could be repurposed to make smaller products, and the scraps from those repurposed to make smaller products still. But the vulnerability of wood to outright extinguishment made its value too risky according to the unwritten rules of austerity. In such a calculus, the capacity of some materials to be broken down into repurposable parts was an advantage only if those materials also had the incapacity to be extinguished altogether. “Extinguishment” is a term that the anthropologist Elizabeth Povinelli uses to describe the ways things live and die, taking different forms or states, decomposing or recomposing, but without the drama of finality (Povinelli 2013). A tree might burn down, a whole forest even, as might a LEGO warehouse filled with wood, but the *extinguishment* of that wood merely means it continues to exist in a different way. Such is the dynamism and circularity of living systems. As some things cease to be, others come to be from what remains. What came to be from LEGO’s abandonment of wood as a material for its products, however, was a reliance on synthetic plastics instead—and plastic defies extinguishment altogether.

LEGO had turned to the production of plastic toys before the company fire of 1960, as it did in earnest in 1947, when it bought a British-made “Windsor” injection-molding machine that could mold plastic into shapes suitable for toys (LEGO.com nd). But the discontinuation of wooden materials in favor of a complete shift to plastics signaled a core company value against the drama

of finitude. Having seen its supplies of wood come to an unfortunate end multiple times, LEGO saw plastic as a more durable, hence more sustainable medium. But it would be a mistake to see the LEGO company's changing relationship to its materials as merely wrought by the "fool me twice" lesson learned from its accidental fires. In the same way that the austerity necessitated by the global economic depression of the 1930s led Christiansen to produce toys instead of furniture, the austerity demanded by the two world wars had influenced the materials available for the toy industry at large: an industry regarded as secondary to the greater cause of the good fight. During wartime, woods and metals were scarce because they were needed for military construction, machinery, and artillery. Plastic began to seem like a viable alternative to consider. It wasn't scarce; it could be custom-shaped and formed to suit any design; it could be easily cleaned; it could be colorful; and it was cheap.

The trouble was, when it came to toys, it was also widely regarded as inferior to wood. As Maaïke Lauwaert has shown in her study of how LEGO changed the nature of construction play, the company's shift from wood to plastic required overcoming a widespread belief that "real" wood was superior to "fake" plastic (Lauwaert 2008). Lauwaert quotes a Danish trade magazine in the early 1950s, *Legetøjs-Tidende* (*Toy-Times*), which reported after visiting the LEGO factory in Billund that "plastic would never be able to replace good and honest wooden toys" (Hansen 1997, 22; quoted in Lauwaert 2008, 222). That sentiment seemed to be part of a broader mid-century social imaginary, in Europe and elsewhere, perhaps best articulated by the French intellectual Roland Barthes in 1957: "Current toys are made of graceless material, the product of chemistry, not of nature. Many are now molded from complicated mixtures; the plastic material of which they are made has an appearance at once gross and hygienic, it destroys all pleasure, the sweetness, the humanity of touch" (Barthes 1972, 54). By contrast, for Barthes, wood "is a familiar and poetic substance, which does not sever the child from close contact with the tree, the table, the floor" (54). It was just this "humanity of touch" and "close contact" that the LEGO company realized needed to be preserved if plastic was to become the preferable material for its products.

Plastic, that is, would have to be wielded *like wood*. Its craftspeople would not only have to work with it in ways that suited the synthetic material's best capacities and avoided its shortcomings. They would also have to overcome the tacit comparison that plastic toys evoked with their wooden predecessors by seeming to demonstrate some of wood's own "natural" qualities—a skill that Ole Kirk Christiansen, and his son, Godtfred, evidently mastered. As Anthony Lane observed in a *New Yorker* article from 1998, "Part of Christiansen's genius was to make the new material feel almost as comforting, as



domestically reliable, as wood itself" (Lane 1998). But the similarities were far from comprehensive. After all, wood has a history, plastic has a future. The former's past is materially evident in its grain and rings, the markers of its once having lived. The latter's future is evident in its lack of a past at all, its dropping from a mold onto an assembly belt to be processed and packaged for a long half-life still ahead.

With LEGO's quiet decision to abandon wood altogether in 1960, not only was LEGO casting its lot in favor of plastic, the company was so all-in as to cast its lot against the non-drama of extinguishment altogether. As Heather Davis explains, "The framework of extinguishment then recognizes the fact that plastic is killing off particular worlds through its proliferation, even as plastic itself remains a materialization of the drama of finitude, refusing to participate in the cycles of extinguishment" (Davis 2015, 355). In the sense that wood's extinguishment, its ceasing to be, involves taking new forms and leaving behind new conditions for the emergence of different ways of being, its "death" is not its end. Burning a tree, for instance, tends to waft the plant's nitrogen into the atmosphere but to leave potassium and calcium carbonate behind to enrich the soil. Plastic, by contrast, leaves nothing behind because it never goes away in the first place.

There's an irony here, of course, in that trees are regarded as environmentally sustainable, while plastic is not, though LEGO's complete shift to plastics was precisely to avoid wood's vulnerability to a totalizing end. The deeper irony, though, certainly the greater inconsistency, is that LEGO in spirit *doesn't* treat finality as the barrier to sustainability. The whole ethos of its interoperable products is to refuse finality. A LEGO set can be anything, and it can be anything again and again. It can't ever be "finished" more than provisionally because it's always subject to further modification. As Seth Giddings argues, "LEGO is nothing without its open-ended, imaginative and hence unpredictable potential" (Giddings 2014, 242). (As one illustration of this value, witness the plot of *The LEGO Movie*, which involves trying to find the "Piece of Resistance," a cap to a tube of superglue that could permanently and disastrously glue all LEGO City together unless the cap can be replaced in time.) The LEGO Group's commitment to repurposability as a principle of austerity makes plastic the ideal medium for its products because synthetic plastics just don't go away or biodegrade, meaning they can be repurposed indefinitely. The trouble is, repurposing is at odds with reproducing, and LEGO continues to produce and reproduce billions of bricks every year—a far cry from austerity.

Indeed, in March 2018, the very same month it announced its "Plants from Plants" sets, the LEGO Group openly admitted it had *produced too many bricks* the year before (BBC News 2018). In turn, warehouses and stores were overstocked, leaving no room for newer products. Because the toy industry

thrives on newness, sales flagged. For the first time in thirteen years, LEGO saw its profits and sales decrease in 2017. The company's response, however, was curiously not to curb production, but to curb shipments. To get retail inventories down again, and thereby make room for newer products, that is, LEGO shipped less stock to its retailers than what consumers were buying. This may have created demand, but it did nothing to reconcile the fundamental tension between repurposing and reproduction. Moreover, LEGO doubled-down on their flagship bricks by blaming the decline in profits to having diversified into products other than toys, such as movies and video games. As the company chairman Jørgen Knudstorp explained, LEGO needed to press "the reset button" and get back to their core focus by "building a smaller and less complex organization" (BBC News 2018). Becoming more sustainable was one way it would do so. From a corporate standpoint, however, being "sustainable" is always both a financial and environmental proposition.

Arguably, once LEGO abandoned wood in 1960, it also abandoned the dream of being a small and not-so-complex company. Synthetic plastic, after all, involves a difficult and scientifically complicated manufacturing process, requiring far greater technical expertise and cost than the timeless craft of woodworking, which can be taught from generation to generation and learned through a sweating brow and calloused hands. LEGO's origins in wood had been sustainable but not austere enough. Conversely, discovering plastics enabled a theoretical austerity but not sustainability. Now it wanted to go around the thumb to get the fingers: that is, *back* to sustainable materials, but this time through a synthetically engineered solution, much the way many climate scientists the world over are looking for ways to geoengineer carbon sequestration instead of just reducing our reliance upon it.<sup>1</sup> Plastic had many affordances, but could it accommodate such a workaround?

## The Art of Plastic

The first-known documented use of the term "plastic arts" dates to 1624. That's well before LEGO was around, and well before "plastic" was even a noun referring to the synthetic material that now chokes our planet's oceans, kills its animals, and piles up as a geological stratum of future evidence for the existence of humans on Earth during the Anthropocene. The term appeared in a British book about architecture, in an otherwise minor passage in which Henry Wotton wrote, "Of this Plastique Art, the chiefe vse with vs is in the gracefull fretting of roofes" (Wotton 1624, II.108). Although what we now think of as the plastic arts generally includes any art or craft that involves shaping

or modeling materials into form (sculpture, pottery, and so on, but also the visual representational arts at large), there's something to the term's early association with architecture that lends well to a study of LEGO and its own plasticity. After all, the first plastic LEGO set, from 1949, was conceived as an architectural modeling kit, and the prehistory of the LEGO company involved carpentry and house-building. That first plastic set, called "LEGO Automatic Building Bricks," featured pieces in four different colors and two shapes: either four- or eight-stud variations (no instruction manuals included). But from those limited options, as fans of LEGO have learned ever since, whole worlds could be built.

The English word "plasticity" derives from the Greek *plassein*, and can mean either to be given form, the ways putty is plastic, or to give it, the way surgery can be plastic. "Plasticity," as Catherine Malabou has put it, "refers to an equilibrium between the receiving and giving of form" (Malabou 2012, 3). But Malabou also notes that plasticity can be destructive too, as for instance in the way explosives can be plastic (Malabou 2012; also see Gisbers 2018, 320–3). This threefold capacity—the capacity to receive, give, and destroy form—makes "plasticity" a way to designate the always only provisionally stable quality of a medium constantly amenable to change. There are all kinds "natural" mediums that exhibit qualities of plasticity: skin, soil, foam, brains, and many more. Though humans have been shaping and reshaping materials into representational forms well before Henry Wotton mentioned the "Plastique Art" in 1624, the materials used to do so were primarily found, grown, or mined natural materials. There was, in other words, an implicit connection between natural materials and representational arts—an unquestioned entanglement of what now goes by the separate names of "nature" and "culture." As Heather Davis points out, "Until the invention of the synthetic polymer that we have come to know as plastic, the arts held a virtual monopoly on artifice; now it is chemical engineers who re-make and re-fashion the earth" (Davis 2015, 348).

In these late days of climate change it should go without saying that plastics are an environmental disaster. But if some evidence is needed, consider that the amount of plastic produced in one year is roughly the same weight as the entire mass of humanity, and that with the very miniscule exception of what's been incinerated, every piece of plastic produced since 1950 is still around in some form or another. Approximately 10 percent of all this plastic ends up in the ocean, much of it as microplastics, the particles of which outnumber the stars in the Milky Way. Soon the plastic in the oceans will outweigh the fish (all statistics above from Earth Day Network 2018). The Great Pacific Garbage Patch (GPGP)—just one of five such places where plastic accumulates en masse in the oceans—is nearly 1 million square miles in size (Lebreton et al. 2018)

making it geographically larger than most of the world's countries. Indeed, an official Declaration of Independence has been filed to the UN on behalf of the GPGP, hoping to make it the world's 196th nation, "Trash Isles," replete with its own currency and flag.

Though many have endeavored the impossible venture of identifying exactly when the age of the Anthropocene began—top candidates include the invention of agriculture, the onset of industrial revolution, and the first testing of nuclear weapons<sup>2</sup>—another contender might be July 13, 1907, in Yonkers, New York. That's when the Belgian chemist Leo Baekeland filed a patent for one of his new inventions, something he called Bakelite. It was the world's first synthetic polymer. As he described the creation in his patent application, Bakelite's innovation was in the means of its production: "A method of making insoluble products of phenol and formaldehyde" (Baekeland 1909). It turns out that "insoluble" was a fitting word for the synthetic plastic Baekeland invented. Not only can it not dissolve but its incapability of biodegrading also poses a problem impossible to solve: plastic sticks around for a long, long time, wrecking enormous havoc on the environment and its living species. We have been living with that insoluble problem ever since, and the planet will live with it well after we're gone.

If, to a certain degree, the plastic industry was officially born when Baekeland's patent was granted on December 7, 1909, the ramifications of its emergence were not yet foreseen—or, at least, not regarded as much of a problem for the environment. Just the opposite: plastic was seen as a great *solution* to the overexploitation of natural materials by human conquest. This was a time when colonialism had already dealt most of its spoils and created consumer demand for products such as ivory and jade, which were desirable in part for their air of exoticism and the status associated with the difficulty of their acquisition. "On a geopolitical level," Jeffrey Meikle writes in his cultural history of plastic, "this desire fueled a search for artificial substitutes for potentially scarce raw materials that had become indispensable to civilized life" (Meikle 1997, 26). In face of an expanding and all-consuming middle class that was seen to threaten, even at the turn of the century, the planetary supply of such rare raw materials as tortoise shell, shellac, horn, and so forth, plastic alternatives presented an obvious commercial opportunity. By potentially offering an artificial but more or less indistinguishable counterpart to real ivory, jade, and so on, the early plastics of Bakelite, Celluloid, and Lucite made plastic seem capable of stanching the depletion of natural materials by humans intent to exploit the environment for their own ends.

In other words, from its very inception plastic has been treated as an *interoperable* material. Though its synthetic and manufactured origins meant that a plastic tusk of ivory, for instance, was not the *same* as real ivory, the plastic

version was capable of being exchanged, used, and displayed as if it were. Indeed, in the case of ivory, the plastic version was sometimes even *too* perfect and regular to be mistaken for the real thing. The ivory that grows from elephants, walruses, or narwhals tends to be variegated in color and texture, almost regularly irregular we could say. For this reason, to achieve greater verisimilitude, manufacturers intentionally built flaws into plastic ivory so it could pass as authentic (Meikle 1997, 22). Over time, the creation of other synthetic polymers gave rise to an enormous industry of global reach and birthed a new market, commercially and aesthetically, for a form of artificiality regarded as more naturalistic than previously possible. As interoperable materials, in short, not only were synthetic plastics pliable and moldable but they could also be shaped and given form with such precision as to replace the more “natural” nonhuman forms that they could be produced to resemble. One variation of this story is the case of artificial plants.

## Plants, Plastic, and Artifice

Artificial plants, both foliage and flowers, have been produced for centuries and across cultures. Though the curious human desire to create fake plants seems to be constant over time and place, the materials and methods have varied. Consider some of the media involved: stained horn shavings (Egyptians), silver and gold (Romans), rice-paper (Chinese), bamboo pith (Japanese), dyed silkworm cocoons (Italians), feathers (South American indigenous peoples), buck-skin and beads (North American indigenous peoples), seashells (Pacific Islanders) (Peterson 1958, 12). Across time and cultures, the purpose and use of artificial plants have varied. Artificial plants have served as part of ceremonial dress, rituals, gift exchanges, and many other cultural functions. For many years, in China, for instance, producing artificial plants was an aesthetic practice, a bona fide art as opposed to a commercial or functional venture. In other cultures, too, fake plants were appreciated in part for the amazing remarkability of their resemblance to the real thing. Marie Antionette is said to have fainted on account of the sheer perfection of a silk rosebud presented to her in 1775 (Encyclopedia.com, 1996, s.v., “Artificial Flower”). The Victorians had faux flowers everywhere, contributing to the Western norm that they could serve a beautifying and decorative end.

Until only relatively recently, because the raw materials used to produce artificial plants were natural and sometimes scarce or difficult to attain, artificial plants were primarily a privilege of the wealthy. The ability by mid-twentieth century to manufacture plausibly real plastic plants, however, made

artificial flora affordable for the masses. In 1955, Hong Kong had just one plastic plant factory; by 1962, it had 997 (Lo 2017). A 1964 article in *The New York Times* identified artificial plants as a burgeoning cultural and economic phenomenon. "As recently as five years ago," the article claimed, "few florists would have touched a polyethylene pansy with a trowel; today, at least half the retail florists in this country not only sell plastics but often recommend them over real plants" (Kohn 1964). The American market for plastic plants was so successful in the mid-1960s that not only could whole plastic landscapes be rented or bought in gross, many people paid "up to \$250 a month to have their polyethylene greenery cleaned, rotated and arranged" (Kohn 1964). Today, in the global economy of late liberalism, artificial plants are often seen as cost-efficient and convenient alternatives to living plants, which require regular watering and maintenance.

By extension, in a bit of backward reasoning, artificial plants have also come to be regarded as a sustainable solution to the problem of how to be more environmentally responsible. And business is booming. The market for fake plants today is massive, from department stores looking to decorate their showrooms to natural history museums looking to make their dioramas seem more realistic. As Anna Liakh noted as Sales Responsible for Plants at IKEA Global (another Scandinavian company that makes modular and interoperable products), "Artificial plants share is increasing year after year. We see that even in the markets where people have historically been more resistant towards artificial plants, they are more open to buying them today. It is probably connected to the sustainability factor" (Perrone 2017). Artificial plants, in other words, are not only convenient for people and organizations that can't be bothered to keep real plants alive. Artificial botanicals are hailed as environmentally responsible for the water and labor that they save. Artificial Christmas trees may be the best example, though in the desert of the American southwest, fake lawns are sometimes used to resemble a healthy and well-watered grass lawn, and "artificial turf" is commonplace on athletic fields for foot sports played outdoors in cold weather climates.

The sustainability of plastic plants, though, is importantly connected to the aesthetic naturalism of these plants. In other words, fake plants would not be treated as viable sustainable products if they didn't realistically resemble living plants. And that capacity is directly related to the affordances of plastic as the naturalistic medium par excellence. Chemically, plastics are not unlike the modularity of LEGO bricks themselves. The basic "building block" of all plastics is a single chemical known as a monomer. When monomers link together, they form polymers. If a "mer" is a single unit, much the way a LEGO brick is a single piece, a polymer is the structure formed by chemically joining many different "mers" to each other, much the way LEGO sets are built by connecting the individual pieces. There are two basic ways that monomers can be

Oct. 20, 1959

L. BOSCO  
PROCESS OF MANUFACTURING PLASTIC FLOWERS  
AND LEAVES IN MULTICOLOR DESIGN  
Filed Aug. 6, 1957

2,908,942

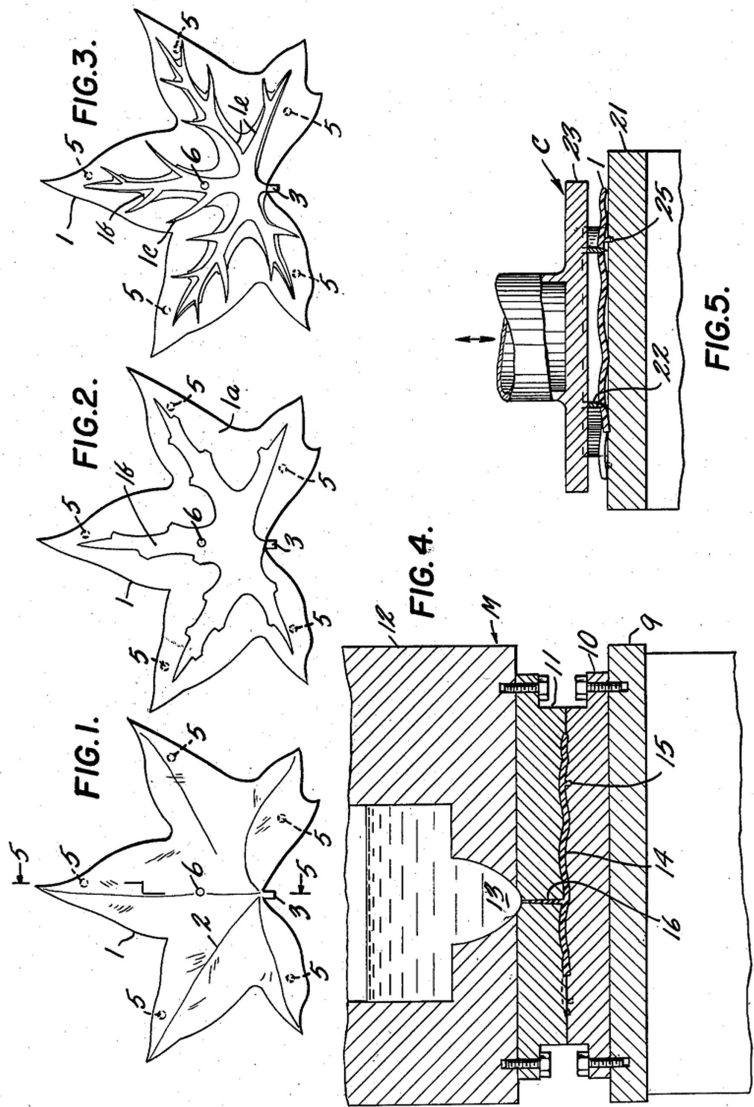


FIGURE 5.2 Patent for process of manufacturing plastic flowers and leaves in multicolor design, 1957. L. Bosco.

“polymerized,” that is, linked together to form polymers, and that’s through either addition polymerization or condensation polymerization, each of which involves different chemical steps leading to different arrangements (linear, zig-zagged, crosslinked, etc.), and hence to materials with different characteristics and applicable uses. It’s this intrinsic capacity for different arrangements that makes plastic, like LEGO itself, such a versatile and powerful product.

In the same way that after Bakelite’s invention fake ivory was manufactured with deliberate flaws in it to better approximate the real thing, one of the latest trends in artificial plants is to give them the appearance of imperfection: some wilting here, asymmetry there, discoloration around the edges. In 2018, a company called “Slightly Browning Fake Plants” launched a Kickstarter campaign to create “high-quality replicas of acceptable-quality plants.” Real houseplants can be hard to keep alive, which makes the perfect greens and sturdy foliage of artificial versions stand out as fakes. While there’s a *cultural* history of artificial plants to be written, however, a *media* history of fake plants would have to consider those materials by which they’re made and ask after the ways such materials determine their situation: that is, what they can do, how they appear, and so on down to how humans then value and use these plants in ways that reciprocally determine *our* situation.<sup>3</sup> After all, the material affordances of synthetic plastics—along with innovations in injection-molding techniques that enabled plastic leaves and stems to be produced with exceptional fidelity to their “real” organic models (Figure 5.2)—were what fostered an interoperable logic whereby the organic and synthetic, the natural and cultural, the real and artificial, the matter and the form, could begin to converge.

## Hylomorphism and Becoming Brick

A long time ago, Aristotle proposed a philosophy known as hylomorphism. Its basic precept is that all substances are composed of matter and form. Neither the matter nor the form of a substance, however, can be neatly divided as if to identify matter here, form there. Rather, matter is made substantive by being *formed* into substance, that is, by virtue of the form it takes. Though matter, for Aristotle, denotes that out of which something is made—the way wood might be the matter of a desk, or stone the matter of a sculpture—matter itself can only be formed into a desk or sculpture through the addition of form: “The arts make their matter” (Aristotle 1992, II.2, 194b33). For such a philosophy, matter is intrinsically formless, even passive and inert, as if waiting to be given form so it can have substance. Conversely, form is active and imposed; it’s what determines, as if from outside materiality, what matter can be.



It should not take much work to see how this sort of thinking aligns with the notion that nature and culture are separate spheres, the former encompassing everything accessible to the senses *except* what's produced by humans in the latter.<sup>4</sup> There is only a short step, in other words, from imagining matter as formless and inert, and form as imposed by an active hand, to imagining nature as the passive matter that human culture actively gives a form. So, human "culture" makes desks and sculptures from the wood and stone of "nature." To be sure, there's something initially self-evident in this way of thinking. A tree, after all, is not a carpenter. It does not cut itself down and make of its trunk a desk with drawers and legs. No one would suggest as much either. But to challenge the division of nature and culture is not to suggest that there are no differences in the capacities of the human and nonhuman, nor to deny that people do make and do things with (and to, and from) the so-called natural resources that predate and exceed the human.

Instead, to challenge the nature/culture divide is to show that each side of the split is so entangled in the other that to posit their division is at best an anthropocentric convenience, and at worst a dangerous imposition of human ontological and ethical superiority over the more-than-human with which we are, of course, inextricably interdependent. Bruno Latour puts it this way, "*The very notion of culture is an artifact created by bracketing Nature off.* Cultures—different or universal—do not exist, any more than Nature does. There are only natures-cultures, and these offer the only possible basis for comparison" (Latour 1993, 104; emphasis in original). Latour's idea of "natures-cultures" or what Donna Haraway calls "*naturecultures*" (Haraway 2003) are accordingly ways to acknowledge that supposing a clean separation between nature and culture is not only untenable but also unethical. To assume a separation of nature and culture, in other words, is both ontologically false and imposes gendered, colonializing, and racist orientations toward how we make sense of any collectivity (see van der Tuin 2018, 269–70).

By contrast, denying a division of nature and culture involves giving priority to *relating* over *the related*. As Iris van der Tuin explains, "Prioritizing relatings entails a perspective on the coming into being of bounded subjects, objects and domains such as the natural and the cultural. Priority is given to studying how, where and for whom boundaries are drawn" (van der Tuin 2018, 269).<sup>5</sup> If we take nature as a given, as what Heidegger would call a "standing-reserve," then we adapt an attitude of exploitation toward it: nature as that which exists to be used in service of human culture (Heidegger 1977, 3–35). The givenness of each side of the relation distracts from the real issue of how such relations are created and mobilized in the first place. To suppose, in short, that humans are imposing their forms on the environment, and that we are somehow

ontologically justified in doing so, is at least tacitly to endorse a modern variation of hylomorphism (see Ingold 2012, 432).

One of the great critics of hylomorphic thinking is Gilbert Simondon. And conveniently, as if he were writing about LEGO, his paradigm case against hylomorphism is the process of molding a brick. A hylomorphic approach to the molding of a clay brick, which assumes an imposition of form upon matter, can only see the “final” product of the molding process: matter given form. In Simondon’s view, emphasis on the final form misses the more essential technical operation of taking on form itself. There’s a modulation involved in the process of individuating each brick, such that “matter and form are made present as forces” (Simondon 2005, 44; quoted as translated in Combes 2013, 5). To recognize as much is to reject the view that matter is passive and forms active. Matter is active insofar as it prepares to change form, that is, active in relation to those colloidal properties and the molecular makeup that effectuate its preparedness to change form as it comes into provisional contact with a mold. But Simondon also eschews the view that *forms* are active. To the contrary, he writes, “Forms are passive inasmuch as they represent actuality. They become active when they organize themselves in relation to the ground, thus actualizing prior virtualities” (Simondon 2007a, 208). The point here is that there are no final terms for the brick, the clay, or the mold, but that the coming together of clay and mold provisionally individuates a brick as a process of creation. It is this *process*, for Simondon, what he calls “ontogenesis,” that is far more important than whatever temporary results the process creates. “Precisely,” he writes, “in the technical operation, it is the mediation itself which should be considered” (Simondon 2007b).

In the case of LEGO, to consider “the mediation itself” is to recognize that LEGO bricks are media technologies that take part in an ongoing process of ontogenesis, not just as plastic works with mold to take form, but as individuated LEGO pieces work with others to take on new form-material relations when someone plays with or builds LEGO. As I write this, for instance, my six-year-old son is across the room building a train out of LEGO originally belonging to a Ninjago set that had nothing to do with trains. But before he began building the train, he had to destroy the shoe he’d already made from the same repurposed pieces, setting aside some that his younger sister had managed to chew. The form-material individuations of LEGO pieces, in other words, including their representational features, are themselves always provisional, subject as they are to what Catherine Malabou describes as the threefold capacity of plasticity to take, give, or destroy form (Malabou 2012; also see Gisbers 2018, 320–23). This insight can help to clarify why the company’s attempt to be more sustainable is not just a

matter of changing ingredients, but a matter of rearranging the very history of LEGO and its materiality. If we reject hylomorphism and take ontogenesis seriously, as Tim Ingold has argued, “We should not thus think of the properties of materials as attributes. Rather, they are histories” (Ingold 2012, 434). And LEGO’s historical relationship to plastic is more nuanced than just a shift away from wood.

The first kind of plastic LEGO used, from 1949 to 1963, was Cellulose acetate, which had the great moldability of most synthetic plastics, but was also highly flammable and too easily deformed. Heat or water, for instance, let alone the general wear of time, could melt or alter the designed form of such toys into something other than their intended form—effectively making them different substances. By 1963, after looking for a more durable material to retain LEGO’s constitutive form over time and against exposure to the elements, the company began producing pieces using acrylonitrile butadiene styrene, or ABS plastic. In contrast to celluloid plastic, ABS offered four principle advantages: (1) durability, (2) color-fastness, (3) strength, and (4) clutch power. Not only would LEGO elements now withstand the wears and ravages of play over decades; they could take on different colors with minimal fading; they’d be strong enough to support larger builds; and they would keep their distinctive ability to interlock tightly. Because ABS plastics are amenable to precise molding and to greater stability, the shift to producing LEGO using these plastics fulfilled one of the company’s foundational commitments to austerity—the principle of making products that truly last.

The trouble is ABS plastic lasts *too well*. This is both commercially risky (if you already have LEGO that works, what incentive do you have to buy more?) and environmentally precarious (what are the costs of making things that can’t be destroyed?). ABS is what’s known as a thermoplastic. That means that at 221 degrees Fahrenheit, ABS plastic reaches its “glass transition,” which enables it to be injection-molded into nearly any desirable form. (LEGO heats its ABS plastic nurdles to 450 degrees Fahrenheit.) Once it cools in the mold, it hardens into a stable form: for instance, into the LEGO bricks we’re accustomed to using for play. But ABS plastics can also be *re*-heated to melting point without chemical degradation, making them fully recyclable. In theory (and with the right equipment), if you had a LEGO brick you didn’t need and lacked one that you did, you could take your superfluous brick, melt it down, and then mold it into whatever brick you needed. But being recyclable is a far cry from being biodegradable. No matter how many times ABS plastics get recycled by being melted down and reformed, the material itself will not degrade. We’re stuck with all this LEGO, which makes the company’s environmentalism all the more important—and all the more challenging to get right.

## Techno-Aesthetics

LEGO's sustainable "Plants from Plants" line is made with a polyethylene plastic derived from the ethanol sourced from sugarcane in Brazil. Leaving aside the carbon emissions associated with its production, processing, and shipping, sugarcane-based polyethylene is sustainable because sugarcane can be regrown, unlike the petroleum that LEGO had used to make the polyethylene in all its botanical elements for decades. Though LEGO uses twenty different kinds of plastic for its products—so a LEGO tree is made of a different type of plastic than a LEGO tire, which is made from a different variety than a minifigure—of the *seventy-five billion* LEGO pieces made annually, only 1–2 percent are made from polyethylene. The overwhelming majority is manufactured using varieties of ABS plastic, which is made from fossil fuels and not replaceable by plant-based alternatives with the same ease that polyethylene accommodates. That means that, with their self-imposed 2030 deadline to use entirely sustainable materials fast approaching, LEGO has some work to do. At a \$155 million price tag, they've built a 4,000 square meter Sustainable Materials Centre in Billund, the company's Danish headquarters, and added over one hundred new employees tasked with finding sustainable alternatives to their current materials. The difficulty is not just that LEGO hasn't found the right materials to replace *their* ABS plastics with sustainable alternatives but also that, unlike with polyethylene plastics, no engineers in any industry have been able to produce bio-based plastics that exhibit the same properties that have made ABS plastics so useful—and especially so for LEGO elements.

As anyone who has played with LEGO can attest, the botanical elements have a different feel than other bricks. They're grainier, more flexible, just not the same. In addition to its goals to help mitigate the damaging environmental impacts of their flagship products, the LEGO Group was also explicit about wanting to make it "feel" as if the bricks hadn't changed at all. In other words, in a tacit hylomorphism, they wanted to change the matter, *but not the form* of the LEGO brick. The form was presumed to be already perfected, in need of no improvements, indeed something that could only be ruined by its alteration. Hylomorphically, to modify the interlocking system that LEGO had popularized—to change the fundamental *form* that LEGO elements took—would be to make a different substance altogether, and hence not what consumers know as "LEGO" at all. As *The New York Times* put it, "In essence, the company wants to switch the ingredients, but keep the product exactly the same" (Reed 2018).

The emphasis on *form* as what separates LEGO from competitors, however, underscores that the company's edge comes largely from its molds. Indeed,

the superlative precision of the LEGO Group's proprietary molds is what gives their bricks the distinctive interoperability and clutch that knockoffs can't match. And unlike other plastic toys—say, an action figure or a dump truck, which aren't modular or interoperable and hence can tolerate minor idiosyncrasies or differences in size and shape from unit to unit—even the slightest deviation in the size or shape of connectable LEGO parts can be catastrophic. The LEGO Group's commitment to sustainability and austerity means that every LEGO piece ever made needs to be able to connect to every other LEGO piece ever made, whether it's from the 1960s or today. All the LEGO elements have been compatible since 1958. Even Duplo bricks, those made at a larger size for younger children, are compatible with the smaller LEGO bricks. For this reason, LEGO periodically "retires" molds when their exquisite precision deviates by even half of a thousandth of an inch. Of course, the molds themselves are not pure form, but rather material arrangements of hyper-engineered metals that themselves needed to be melded and molded into form of their own.

If ontogenesis makes it difficult to think about what falls on either side of the process of becoming, we are left to recognize that the boundaries are more fluid, that matter and form, feel and function, are constitutively interdependent—particularly so, the example of LEGO suggests, when it comes to sustainability. In its commitment to using new and sustainable plastics without sacrificing the melding of function and feel that makes LEGO elements so unique, the company has had to specify what it means by "sustainable" in the first place. "By sustainable materials," Søren Kristiansen, director of the LEGO Materials Department, has said, "we mean materials regarding which there is no compromise on safety or quality, and that give the same play experience. Durability is key" (Bioplastics Magazine 2017). Consider that for moment. *Durability is key*. It's not just that the LEGO Group wants to mitigate fears from fans that their product will change in quality when its bricks eventually are made from different materials. That's understandable enough. LEGO also wants these products to retain their same durability, to last a long time.

Plastics, of course, are nothing if not durable. Notwithstanding whatever carcinogenic toxicity some plastics may also have, the biggest problem they pose for the environment is that they just never biodegrade. It would be one thing to say, "We realize that *all* plastics are bad for the environment. We're not going to stop making LEGO pieces from plastics, but we will try to produce them in ways that create a lower carbon footprint." Instead, LEGO basically says, "Our plastics will be sustainable *because* they'll be durable." Consider, for instance, one FAQ from LEGO's official website that tries to resolve common questions about the new "Plants from Plants" line. "Q: Is plant-based plastic biodegradable. A. No" (Lego.com 2018). After that it gets circular (see Figure 5.3).

**Q: Is plant-based plastic biodegradable?**

**A:** No. As the LEGO Group wants our products to be durable and bring play value to generations, the plant-based plastic the LEGO Group is using is not biodegradable. Therefore, we have chosen to focus on using plant-based plastic which is durable and reusable.

**FIGURE 5.3** *Screenshot of FAQ from Lego.com about the “Plants from Plants” initiative, July 30, 2018.*

By defining an approach to sustainability in part by the achievement of durability, LEGO effectively says we don’t even *want* our products to biodegrade. This staunch commitment to physical longevity, rooted as I’ve tried to argue in the company’s historical commitments to austerity, seems to run so curiously counter to the agenda of environmentalism that a reasonable suspicion could attend the company’s motives. Certainly, there are economic and commercial advantages to be gained by “going green.”

For instance, in a well-publicized example from 2011 (publicity being part of the point), Taylor Guitars changed its practices around the procurement and milling of ebony used in its fingerboards. In the guitar world, the aesthetic preference has long been for acoustic guitars with fingerboards made of monochromatic, black ebony tonewood. But this kind of dark and single-color ebony is relatively rare; and, because it’s harvested from the heartwood at the center of a tree’s trunk, in practice entire trees were being cut down to see if the uniformly colored ebony was present, which is only the case for about one in ten trees. Given the strong commercial preference for uniformly black ebony, this meant that trees cut down to reveal a more variegated heartwood were typically left behind. With ten trees felled to find just one “usable” trunk, the guitar industry was contributing to incredible environmental waste and labor inefficiency. Taylor decided to do something about it. They bought their own processing plant and began making guitars with fingerboards made from variegated ebony, introducing a new and more environmentally conscientious norm to replace the wasteful industry preference for black tonewood alone. Doing so also gave them control over the means of production, and hence a better bottom line.

Though the shift to LEGO made from plant-based plastics instead of petroleum-based plastics can be understood as a similar corporate initiative to create greater efficiency of production while being more ecologically responsible, I think we would be misunderstanding LEGO if we adopted a critical cynicism. In addition to a long-standing commitment to the longevity and interoperability of its products, the LEGO Group is also invested in upholding Ole Kirk’s original motto, *Det Bedste Er Ikke For Godt* (Only the Best is Good Enough).

And what's taken as "best" here involves a particular relationship between the aesthetics and function of LEGO products—a relationship that plays out differently in LEGO than it does in acoustic guitars.

A guitar should operate just the same whether its fingerboard is made of solid black or variegated ebony. What's at stake is "the look" of the guitar relative to received norms about what that look conveys in social capital. The sound and playability should remain unchanged. A LEGO brick made from a new kind of plastic, however, would potentially be a different product altogether, the way Taylor's guitars might have been, by virtue of playing or sounding different had they switched to an all new *kind* of wood, say, from ebony to pine, instead of merely switching to a different hue or grain of the same tonewood. With LEGO, the technical affordances of the medium—that is, the functions that a brick can perform—are uniquely entangled in the aesthetics of the bricks themselves. To change one is to change the other.

LEGO pieces have what Simondon, in an unsent but posthumously published letter to Jacques Derrida, describes as *techno-aesthetics*: a kind of "intercategorical fusion" between a material thing's technical and aesthetic aspects, which makes them "perfectly functional, successful, and beautiful" (Simondon 2012, 2). That a workman's tools, for Simondon, are great exemplars of techno-aesthetics owes to the way their functionality and the beauty of their design converge in a tactile pleasure experienced at the level of aesthetic sensation for both the tool's creator and user. The painter feels her paints, as does the perceiver of her painting. So it is that Simondon celebrates "the bite of a saw with clean teeth" (3), the way the poet W. H. Auden extols poems that "click like a closing box" (Wellesley 1964, 22), or the novelist Vladimir Nabokov, ever the synesthete, performs a techno-aesthetics of his own by describing the "square echo" of a car door slamming (Nabokov 1990, 59). The technicity of a thing cannot be separated from its sensorial and aesthetic affects,<sup>6</sup> and techno-aesthetics are achieved when the intercategorical fusion of these elements is something we experience as a provisional realization of the medium's potential. Techno-aesthetics puts a kind of naturalism to work: though we hadn't known it before, the car door can only slam as a square echo. LEGO pieces *have* to be durable and clutch just-so, that's their "natural" form.

The near-perfect clutch of LEGO pieces, as experienced in play, is evidenced in the sensuous and tactile pleasure of connecting two pieces together. But as part of LEGO's techno-aesthetics, that sensuous clutch is also what makes LEGO more "sustainable" than other construction toys. Its pieces just stick together better, for longer, and more easily than other similar construction toys. Not only is the LEGO Group well aware of this virtue in its product; the way LEGO pieces stick together and *stay* stuck together is also one reason

that LEGO enthusiasts have such fierce brand loyalty. Other products, such as China's Lepin bricks, or Canada's Mega Bloks, are often taken not to have the same techno-aesthetic value. As Victor Fernandez, the owner of EclipseGrafx, a company that customizes LEGO bricks and minifigures, has said of Mega Bloks in particular, "They don't click well either. I mean, you can build a whole building with a Mega Blok, but if you breathe on it, it will probably fall over" (Fernandez 2017). Disputations about brand superiority aside, the interesting phenomenon here is that LEGO exemplifies not just an artful pairing of form and function, but that this pairing is an achievement that suggests the product's sensorial aspects cannot viably be separated from its sustainability.

## Sensorial Sustainability

Before the "Plants from Plants" set had become a reality, and without any mention of the company's larger mission of shifting to bio-based plastics altogether, LEGO put its builders to work making at least two trees of lifelike size. First, in April 2017, the LEGO Group installed an enormous tree resembling a giant oak inside the atrium of the LEGO House in Billund. Almost exactly a year later, they installed a giant sakura (cherry) tree outside at the LEGOLAND park in Nagoya, Japan. Though the representational features of each tree are mimetically impressive, no one up close would mistake these trees for their living models. Together, though, each in different ways encapsulates something of the LEGO approach to fake plastic trees and the naturecultures boundary work that characterizes the company's way of thinking the sustainable by way of the sensorial. By way of conclusion, then, I'd like to offer a short read of these two LEGO trees followed by some thoughts about sensorial sustainability.

At 15 meters high, and made of 6,316,611 pieces, the *Tree of Creativity* inside the LEGO House in Billund is easily one of the largest LEGO models ever constructed. Built offsite over 24,350 work hours, the tree's onsite installation alone took 1,200 hours, with installers using ropes and pulleys like actual lumberjacks to climb and attach modular clumps of bark and branch, leaf and twig, together around a metal frame. The sheer scale is staggering. The *Tree of Creativity* was designed to fit a particular location in the LEGO House, specifically to rise up the middle of a wide interior staircase that wraps around the tree so visitors ascending the stairs can circumambulate the trunk and see the various other builds—moonscapes, train stations, airports, monkeys—constructed on the topside of the many leaf canopies. What's so impressive is not just the build's size and artistry, but the ways it instantiates



so much of what LEGO stands for when it comes to its relationship with the environment and its materials.

Consider, for instance, the base where the tree's "wooden" root system connects to the "grass" in which it grows. The base consists in thousands of disconnected green LEGO bricks, mostly 2 x 4s, piled there around the roots as if a kid had taken a box of bricks and dumped them on the floor. This rubble of unconnected green bricks is the most "non-built" component of the entire installation, and hence, in a way, the most "natural." In part because the pile of bricks serves to represent the grass or moss—that is, *not* the tree that is clearly the focus of the build—it enacts the wildness of nature in ways the more meticulously designed trunk and branches do not. The *Tree*, after all, is intended to appear not just as a tree, full-stop, but as a *built* tree, and one that is still in progress at that. At the tree's top, above the canopies of leaves, a yellow mechanical crane extends from the core of the uppermost remaining portion of the trunk, as if there were still more tree to be built. This crane overtly indicates that this isn't a naturalistic representation of a real tree, but an unfinished representation of a LEGOfied tree: wood become plastic, plastic become wood, a permanently still in-progress construction whose ontogenesis is always underway (Figure 5.4).

According to Jesper Vilstrup, vice president of the LEGO House, "The tree is a metaphor for the entire LEGO Group, containing references to both wooden toys and a company in growth" (LEGO Group 2017). If the mechanical crane is a reference to the company still in growth, the reference to wooden toys is to be found in the form of a toy duck "carved" into the trunk by design—a nod to the first LEGO toy, a duck on wheels, back when wood was the company's medium of choice. Like lovers carving their initials in a tree, the duck acts here as a sort of skeuomorphic graffiti, defacing the tree on purpose so to represent a tree that's been defaced. But the unruly pile of green bricks has also made the tree subject to unanticipated modifications. On my visit, enterprising visitors had reached over the edge of the tree's planter and taken pieces from this pile to construct small builds of their own, which they'd then affixed to the tree's roots like weird outgrowths or mushrooms—actual LEGO graffiti. While it would be too brazen to take elements off the tree trunk itself, the trunk being so self-evidently the cultured result of human craft and creativity, the pile of green bricks, by contrast, with its natural disorder and abundance, was more or less ready-at-hand to be appropriated by visitors for their designs. The *Tree of Creativity*, that is, not only takes and receives form, by plan and otherwise; it exemplifies that only so much can be controlled, that non-appropriative relationships to "nature" and "culture" alike require acceding that they are more imbricated than it seems.



**FIGURE 5.4** *The Tree of Creativity in the LEGO House, Billund. Photo used with permission. ©2019 The LEGO Group.*

The second of LEGO's big tree builds illustrates this as well. The sakura tree, built in 2018 for the first anniversary of LEGOLAND Japan, may not be as large as the *Tree of Creativity*, but it's just as impressive. And it's still awfully big. At 881,470 bricks, it holds the distinction of being in the Guinness Book of World Records as the world's "largest LEGO brick cherry blossom tree." Built by hand in the Czech Republic over the course of 6,500 work hours, it features drooping pink and white blossoms, illuminated lanterns, and a bed of undulating grass at its base, all made from LEGO bricks assembled around a hidden metal frame. Unlike the *Tree of Creativity*, the sakura's grass base is built purposefully with connected bricks of different shades, including some white patches meant to represent blossoms that had fallen from the branches

above. To be installed in the LEGOLAND park, it had to be shipped from the Czech Republic in modular parts that arrived in modular shipping containers of their own. Though I've not yet seen the tree in person, its prepossessing qualities are enchanting even in photos and videos. With the delicacy of a living sakura, the sinuousness of its wood and the waft of its leaves achieve a naturalism that makes it somehow seem to belong outdoors. Though it's within easy grasp, no one appears to have defaced it.

It may be incidental, but it's not insignificant, that the sakura tree is in LEGOLAND while the *Tree of Creativity* is in the LEGO House. The sakura is there to be looked at, a finished product presented as a flowering part of a landscape. It's situated outdoors among the elements. The *Tree of Creativity*, by contrast, is a domestic build, literally *inside a house*, and it's more evidently still in progress, both as visitors add their own mini-builds to its roots and as the mechanical crane indicates by protruding permanently from the top. The differences here are important insofar as they indicate some of the boundary-marking that LEGO has done around the human relationship to the environment. As Lauwaert has shown in her book, *The Place of Play*, LEGO's shift from wood to plastic also signaled a new relationship to the materials: "The evolution from wooden building blocks to plastic designing bricks changed the way children could play with LEGO toys"—and where that play should occur (Lauwaert 2009, 53). Wood was for outside, plastic for in. As the LEGO company itself put it in a 1975 publication, LEGO bricks are "much more convenient for indoor use" than for outdoor play (LEGO Company 1975, 5). Indeed, not just for play, but for display too: the sakura tree has had to be taken down during inclement weather, so not to be damaged by the summer heat. Curiously, that accommodation is not usually made for those builds in the park's "Miniland," which features miniature LEGO skylines and cityscapes from across Japan. Though the country's iconic buildings displayed there are as LEGOfied as the sakura, the becoming-plastic of wood seems to require it be moved indoors in ways that the buildings do not—as if acceding that to LEGOfy the natural is to subdue its fundamental animacy.

In *The Spell of the Sensuous*, David Abram argues that no matter how distant we may have become from the natural and organic basis of those materials we use in everyday life—from a pencil to a car—in one way or another, however abstractly and even with some preconscious distance, we nevertheless retain something of our connection to the earth through the technologies and tools that mediate our lives:

Our human-made artifacts inevitably retain an element of more-than-human otherness. This unknowability, this otherness, resides most often in the materials from which the object is made. The tree trunk of the

telephone pole, the clay of the bricks from which the building is fashioned, the smooth metal alloy of the car door we lean against—all these still carry, like our bodies, the textures and rhythms of a pattern that we ourselves did not devise, and their quiet dynamism responds directly to our senses. (Abram 1996, 64)

As Abram sees it, the trouble is that our sensorial attunement to the quiet dynamism of this earthly connection is being attenuated. It's as if we are losing a kind of sensorial literacy, the ability to feel connected with the earth and its natural wonders.

The mass production of interoperable products only exacerbates the problem and distances us from the dynamic animism of the earth. Too often, Abram notes, "this dynamism is stifled within mass-produced structures closed off from the rest of the earth, imprisoned within technologies that plunder the living land" (64). For Abram, though we never lose our earthly connection entirely, we would do well to cultivate it more directly. The aim is to be more "a part of" and less "apart from." How then, we might ask, does LEGO's move to plant-based elements reconnect us, if at all, to our sensorial empathy with the world? Indeed, it is precisely the rupture of that connection that LEGO enthusiasts have complained will be lost with the new bricks, manifest at least in their sensorial tactility.

On the one hand, the argument that LEGO elements produced with sugarcane will lose their techno-aesthetic essence sounds a bit like arguments that digital books shortchange readers the tactile pleasures of holding a book in one's hands and leafing manually through the pages. Historically, people have always shown a stubborn nostalgia for the familiar expressed as a reluctance to adapt to newer technologies whose unfamiliarity registers as fearful because unknown. On the other hand, arguments that sugarcane-based LEGO elements will lose their "feel" reinforce an important connection between artifacts made by human design and those "natural" or organic elements that constitute the more-than-human world. It's all too easy to forget, as Julia Corbett notes, that "nature is in absolutely everything you touch" (Corbett 2018, 15). The more we can hold that in mind, whether or not by feeling it in hand, the more we will see the error in drawing boundaries between nature and culture by supposing one can ever be disarticulated from the other.

And yet, so much of LEGO's discourse operates along a series of such boundary markings. Big LEGO pieces are for little kids; little LEGO pieces are for big ones. Plastic toys are best for indoor play, wooden toys for outdoors. Sustainability is not a matter of staving off environmental catastrophe, but sometimes just making sure our own tiny worlds last longer. In a way, LEGO is a medium for anesthetizing our loss of connection to nature. Making plants

from plants *might* restore some of that connection, but it's our job, whether in play or appreciation, to keep that connection close. Sustainability is more than scientific. It's not just a technical problem to be engineered away. Sustainability is also sensorial, a matter of forming a new attunement to the wondrous dynamism of the world that's already around us, and building better worlds therefrom.

## Bibliography

- Abram, David. *The Spell of the Sensuous*. New York: Vintage Books, 1996.
- Aristotle. *Aristotle Physics Books I and II*. Trans. William Charlton. Oxford, UK: Clarendon Press, 1992.
- "Artificial Flower." "How Products Are Made." Encyclopedia.com. (September 13, 2019). <https://www.encyclopedia.com/manufacturing/news-wires-white-papers-and-books/artificial-flower>.
- Baekeland, Leo H. "Method of Making Insoluble Products of Phenol and Formaldehyde." US Patent 942699, filed July 13, 1907 and issued December 7, 1909.
- Barthes, Roland. *Mythologies*. Trans. Annette Lavers. New York: Noonday, 1972.
- BBC News. "Lego Admits it Made Too Many Bricks." *BBC News*. Published March 6, 2018. Accessed <https://www.bbc.com/news/business-43298897>.
- Blakemore, Erin. "The Disastrous Backstory Behind the Invention of LEGO Bricks." History.com, August 29, 2018. Accessed <https://www.history.com/news/the-disastrous-backstory-behind-the-invention-of-lego-bricks>.
- Chakrabarty, Dipesh. "Anthropocene Time." *History and Theory* 57, no. 1 (March 2018), 5–32.
- Combes, Muriel. *Simondon and the Philosophy of the Transindividual*. Trans. Thomas LaMarre. Cambridge, MA: MIT Press, 2013.
- Corbett, Julia. *Out of the Woods: Seeing Nature in Everyday Things*. Reno, NV: University of Nevada Press, 2018.
- Davis, Heather. "Life and Death in the Anthropocene: A Short History of Plastic." In *Art in the Anthropocene*, edited by Heather Davis and Etienne Turpin, 347–358. London: Open Humanities Press, 2015.
- Earth Day Network. "Fact Sheet: End Plastic Pollution." Published March 7, 2018. Accessed <https://www.earthday.org/2018/03/07/fact-sheet-end-plastic-pollution/>.
- Fernandez, Victor. Interviewed by Nicholas Taylor, at BrickUniverse Convention, Raleigh, NC, April 9, 2017, transcript.
- "The First LEGO Plants Made Based on Plants." *Lego.com*, Ourstories, July 30, 2018. Accessed <https://www.lego.com/en-au/aboutus/responsibility/ourstories/plants-from-plants>.
- George, Sharon, and Deirdre McKay. "'Sustainable' LEGO: Plastics from Plants won't Solve a Pollution Crisis." *The Conversation*, March 13, 2018. Accessed <https://theconversation.com/sustainable-lego-plastics-from-plants-wont-solve-a-pollution-crisis-92953>.

- Gherasim, Bogdan. "The LEGO Group Aims for 100% Sustainable Packaging by 2025." LEGO.com, Newsroom. April 22, 2018. Accessed <https://www.lego.com/nb-no/aboutus/news-room/2018/april/lego-sustainable-packaging-2025>.
- Giddings, Seth. "Bright Bricks, Dark Play: On the Impossibility of Studying LEGO." In *LEGO Studies: Examining the Building Blocks of a Transmedial Phenomenon*, edited by Mark J.P. Wolf, 241–267. New York: Routledge, 2014.
- Gisbers, Tom. "Plasticity." In *The Posthuman Glossary*, edited by Rosi Braidotti and Maria Hlavajova, 320–323. London: Bloomsbury Academic, 2018.
- Hansen, Ole Steen. *Grote Zakensuccessen*. Godtfred Kirk Christiansen En Lego. Trans. Marina C. Sollefeld. Gilze, NL: Dahlgaard Media B.V., 1997.
- Haraway, Donna. *The Companion Species Manifesto: Dogs, People, and Significant Otherness*. Chicago: Prickly Paradigm Press, 2003.
- Heidegger, Martin. "The Question Concerning Technology." In *The Question Concerning Technology and Other Essays*, trans. William Lovitt, 3–35. New York: Harper & Row, 1977.
- Ingold, Tim. "Toward an Ecology of Materials." *Annual Review of Anthropology* 41 (2012), 427–442.
- Kohn, Sherwood. "The Flowering of Fake Flowers." *New York Times*, August 23, 1964.
- Lane, Nathan. "The Joy of Bricks." *The New Yorker*, April 19, 1998. Accessed <https://www.newyorker.com/magazine/1998/04/27/the-joy-of-bricks>.
- Latour, Bruno. *We Have Never Been Modern*. Trans. Catherine Porter. Cambridge, MA: Harvard University Press, 1993.
- Lauwaert, Maaïke. *The Place of Play: Toys and Digital Cultures*. Amsterdam: University of Amsterdam Press, 2009.
- Lauwaert, Maaïke. "Playing Outside the Box—On LEGO Toys and the Changing World of Construction Play." *History and Technology* 24, no. 3 (2008), 221–237.
- Lebreton, Laurent, Boyan Slat, Francesco Ferrari, Bruno Sainte-Rose, J. Aitken, R. Marthouse, Sara Hajbane, Serena Cunsolo, Anna Schwarz, A. Levivier, Kimberly Noble, P. Debeljak, H. Maral, Rosanna Schoeneich-Argent, Roberto Brambini, and Julia Reisser. "Evidence that the Great Pacific Garbage Patch is Rapidly Accumulating Plastic." *Scientific Reports* 8, Article 4666 (2018).
- LEGO Company. *A Brick—And the Story Behind It*. Billund, DK: LEGO Company, 1975.
- LEGO.com. "Entering the Age of Plastics." LEGO.com, no date. Accessed June 20, 2019, <https://www.lego.com/en-us/themes/lego-history/articles/entering-the-age-of-plastics-cef6607f3856452d920b728b982ce947>.
- LEGO Group. "The World's Most Iconic LEGO Model at LEGO House." Press Release, April 6, 2017. The LEGO Group. Accessed June 20, 2019, <https://www.legohouse.com/en-gb/press-release/2017/april/tree-of-creativity>.
- "LEGO Making Slow but Steady Progress Towards 2030 Sustainable Materials Goal." *Bioplastics Magazine*, April 4, 2017. Accessed <https://www.bioplasticsmagazine.com/en/news/meldungen/04042017-Lego-progressing-towards-2030-sustainability-goals.php>.
- Lo, York. "The Forgotten Jewish American Tycoons Behind the HK Plastic Flowers Industry." *The Industrial History of Hong Kong*. December 18, 2017. Accessed <https://industrialhistoryhk.org/the-forgotten-jewish-american-tycoons-behind-the-hk-plastic-flowers-industry/>.

- Malabou, Catherine. *Ontology of the Accident: An Essay on Destructive Plasticity*. Trans. Carolyn Shread. Cambridge, UK: Polity, 2012.
- Meikle, Jeffrey. *American Plastic: A Cultural History*. New Brunswick, NJ: Rutgers University Press, 1997.
- Morton, Timothy. *Hyperobjects: Philosophy and Ecology after the End of the World*. Minneapolis: University of Minnesota Press, 2013.
- Nabokov, Vladimir. *Bend Sinister*. New York: Vintage, 1990.
- Perrone, Jane. "Houseplants at IKEA: Q&A with Anna Liakh." Jane Perrone Blog. March 17, 2017. Accessed <https://www.janeperrone.com/blog/2017/3/17/houseplants-ikea-qa-with-anna-liakh>.
- Peterson, George E. "Artificial Plants." *Curator: The Museum Journal* 1, no.3 (1958), 12–35.
- Povinelli, Elizabeth. "Keynote Speech." The Anthropocene Project: An Opening. Berlin, Germany, January 20, 2013.
- Reed, Stanley. "Lego Wants to Completely Remake Its Toy Bricks (Without Anyone Noticing)." *The New York Times, Energy and Environment*. August 31, 2018. Accessed <https://www.nytimes.com/2018/08/31/business/energy-environment/lego-plastic-denmark-environment-toys.html>.
- Simondon, Gilbert. *L'individuation à la Lumière des Notions de Forme et d'information*. Paris: Éditions Jérôme Millon, 2005.
- Simondon, Gilbert. "On Techno-Aesthetics." Trans. Arne De Boever. *Parrhesia* 14 (2012), 1–8.
- Simondon, Gilbert. *The Physico-Biological Genesis of the Individual*. Trans. Taylor Adkins, Fractal Ontology Blog, October 3, 2007b. Accessed <https://fractalontology.wordpress.com/2007/10/03/translation-simondon-and-the-physico-biological-genesis-of-the-individual/>.
- Simondon, Gilbert. "Technical Individualization." Trans. Karen Ocana. In *Interact or Die!*, edited by Joke Brouwer and Arjen Mulder. Rotterdam: V2 Publishing/NAi Publishers, 2007a.
- van der Tuin, Iris. "Naturecultures." In *The Posthuman Glossary*, edited by Rosi Braidotti and Maria Hlavajova, 269–70. London: Bloomsbury Academic, 2018.
- Wellesley, Dorothy. *Letters on Poetry From W.B. Yeats to Dorothy Wellesley*. London: Oxford University Press, 1964.
- Wotton, Henry. *The Elements of Architecture*. London: Printed by John Bill, 1624.