



# Beech eating machine:

## A new materialist critique of the *Thonet no. 14* chair

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Blucher Design  
Proceedings  
November 2016,  
Number 1, Volume 1  
<http://www.proceedings.blucher.com.br/article-list/icdhs2016/list>

### Abstract

This paper adopts a new materialist framework, developed from Deleuzian-Guattarian concepts of affect, to assess the socio-environmental relations of the Thonet *No. 14* chair in forestry, industry, culture and labour. The hybridity of industry, forestry and human force with the chair's materiality, operating by processes of sensation and perception, is examined in the context of manufacturing and consumption culture. The chair's lightness, stiffness and strength, its experimental design and innovative use of steam power, is shown to have triggered production and consumption events with social and environmental consequences. Material expressions are framed as micropolitical affects that propagated into macropolitical fields via the sensory experience of the chair's material conditions and forces, binding consumers and producers into patterns of behaviour. These are discussed in reference to cafe culture, lion taming, and the expansion of the Thonet empire – including their labour practices, use of proprietary currency and effect on European forestry. The value of this kind of new materialist inquiry to contemporary aspects of production and consumption is briefly speculated.

### Keywords

Furniture design, affect, new materialism, Thonet, production, consumption

### Introduction

One of the most successful consumer products of the nineteenth century, the Thonet *No. 14* chair (1859) (fig. 1) was the world's first industrially produced bent-wood chair and the first mass-produced chair; selling by the millions (Rawsthorn, 2008) (Doick, 2009). The chair was designed for transport and local assembly; each chair comprises six pieces of wood and ten screws (fig. 2), that can be packed in a small shipping crate with enough parts to assemble 36 chairs (fig. 3) – now considered the first instance of 'flat-packed' furniture (Doick, 2009) (Miller, 2005: 285). The chair is recognised the world over, commonly associated with use in cafes and restaurants, and was influential to certain changes in society and industry during the late-nineteenth and early-twentieth centuries.

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A 2012 article for the *New York Times* by design critic Alice Rawsthorn introduced a relationship between the *No. 14* chair and the philosophical concept of affect (Rawsthorn, 2012). A number of material aspects sensible in the chair are described; for example, the machine-assisted curvature of its wood, the discrete number of components and its light weight. Rawsthorn identified perceptions dependent on the expressions of these materialities, including robustness, strength, reliability and humanism, borne from its assembly-line precision and gentle, undecorated curvature (Rawsthorn, 2012). Rawsthorn described these expressions as affects. While noting that such expressions may spark or activate emotions in those who experience them, she nonetheless invoked the early distinction made by Baruch Spinoza (1632–1677) between affect and emotion, in which affect is distinguished

#### How to quote:

KEULEMANS, Guy; "Beech eating machine: A new materialist critique of the Thonet no. 14 chair", p. 354-360 . In: Wong, Wendy Siuyi; Kikuchi, Yuko & Lin, Tingyi (Eds.). *Making Trans/National Contemporary Design History* [ICDHS 2016 – 10th Conference of the International Committee for Design History & Design Studies]. São Paulo: Blucher, 2016. ISSN 2318-6968, DOI 10.5151/despro-icdhs2016-04\_010

by a “transformative” agency (Rawsthorn, 2012). It is this idea of transformative agency expressed in the chair’s affects upon society, culture and environment, that grounds the work of this paper within the theoretical framework of ‘new materialism’ developed by Jane Bennett (2010) and based on concepts of affect from Gilles Deleuze and Félix Guattari (1987, 1994).



Fig. 1: *No. 14 chair* by Michel Thonet (1859)



Fig. 2: Anatomy of a *No. 14 chair* at the Austrian Museum of Applied Arts / Contemporary Art in Vienna

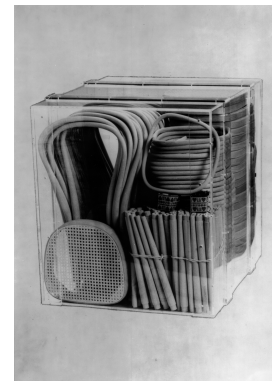


Fig. 3: Michael Thonet, *No. 14 chair* (demonstration of the chair packed for shipping), Thonet (1859) (Vege sack, 1997)



Fig. 4: Steaming ovens at the Thonet factory in Bistritz c. 1920 (Vege sack, 1996: 70)

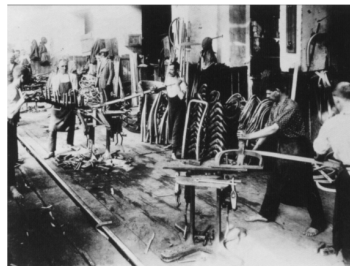


Fig. 5: Barefoot workers at the Thonet factory in Bistritz c. 1920 (Vege sack, 1996).



Fig. 6: A contemporary photo of the Thonet jig-bending process developed in the 19<sup>th</sup> century, still in use (photo credit: Thonet/Claus Setzer). The extreme curves achievable by this method were not previously possible without ply-construction

The affect-based framework of new materialism lends itself to such inquiry because of its theoretical capacity to connect material, via sensation, to human and non-human experience (Deleuze and Guattari, 1994: 172–179). This is an inquiry that intends to uncover details of the transformative experiences potentialised by the *No. 14* chair, including broader socio-ecological consequences within systems of production and consumption. The opportunity is to grasp the connection and movements of affects between production, consumption and ecological concerns simultaneously, rather than as discrete areas of investigation. This movement is not limited to human experience, but flows between non-human things as well, be they objects, things, systems or animals (Bennett, 2010: xiii–x). Deleuze and Guattari describe affects as human/non-human hybrids, “non-human becomings of man” (Deleuze and Guattari, 1994: 169). The consequence for design is that an object, such as a designed product, can activate a passage – a set of relations – between a user, consumer, or producer, and many other things, including ecological or cultural systems – via sensations in material. I will explain how the affects of the *No. 14* chair transmit through material, modulated by designed features that have capacity to draw out form, structure and other sensory qualities, and in doing so, place humans in transformative relation with the world (Smith, 1996: 40–41).

For Jane Bennett, new materialist theorisation considers a vitalistic agency across all forms of matter and material – whether human, animal, plant, mineral or other – for the discovery of ecological and political interactions. This theorisation destabilises the anthropocentric analyses paradigmatic to Cartesianist frameworks and the conception of matter as inert (Bennett, 2010: x, xx, 21). Bennett believes that the traditional view of matter as inert may encourage the “earth destroying” practices of contemporary production and consumption, and that a converse view of matter as alive and active may foster improved ecological awareness (Bennett, 2010: ix). An



Fig. 7: 214k chair (2009). Adapted by the Thonet company in 2009 (credited to Michael Thonet). The addition of a tortuously bent knot in the front leg breaks the familiarity the chair has developed over time and reasserts the extreme capabilities of the steam bending process and novelty of the original design

example of a new materialist analysis relevant to contemporary production and consumption of furniture is Tom Roberts' research on the brand Ikea, that posits Ikea is a vast interrelated system "from petrochemicals to pine" with extensive ecological relations emergent and sensible within the design of their products and retail spaces (Roberts, 2012: 2526). In the following analysis, I likewise intend to show how a thread of affects flows between the No. 14 chair, as a material object, and its presence in human and environmental ecologies. This analysis is an act of following material qualities into systems of production, consumption and use.

## Analysis

The No. 14 chair has certain expressions identified in the discourse. A Modernist interpretation is that its steam-bending manufacture expresses an ability to control nature, but also a tension between technology and nature (Gleiniger, 1998: 40). Straight sections of beech tree are manipulated via a machine-driven power – the heating of water to produce steam. This was a defining technology of the Industrial Revolution and, from around 1855, Michel Thonet used a custom-built steam engine in his factory to expedite production (fig. 4).

A similar expression of captured, natural force is embodied in other

steam-based inventions of the time, most notably the steam train and the steam ship. However, unlike steam trains and steam ships, the No.14 chair was small, light and modest in price. Rawsthorn argues that the chair, being comfortable and friendly in contrast to the new noisy, smoky machines, helped make the Industrial Revolution palatable to society (Rawsthorn, 2008).



Fig. 10: Pablo Reinoso, *TH 24, Série Thoneteando*, (2007). Photo Credit: Estudio Cavallero



Fig. 11: French Thonet chair labels advising the occasional re-tightening of screws. Retrieved from <http://www.aubonusage.com/signaturesetiquette/index-en.html>

books or film. The Thonet chair exerts this perception (it returns unchanged to the viewer at the moment of seeing the chair), but it also modulates that perception by sustaining the duration of the bend. The curves are held indefinitely. This is an affect – a force becoming sensible: a force of plasticity and permanency, or permanent curvature, embedded in the chair.



Fig. 8: Steam bent wood sample, Thonet Catalogue (2014). Photo: Mirko Krizanovic



Fig. 9: M/M Paris, *Thoumieux Chair* (2011) (King, 2013: 427)

Steam power is therefore domesticated within the design of the chair, but nonetheless, its presence is still felt. Thonet chairs are made from solid square profiled sections of beech wood, softened by heat and pressure in steam ovens, attached temporarily to metal strips and bent in cast iron, hand-operated jigs (Vegeasack, 1996: 32 & 65) (figs. 5 & 6). The square profiles are then sanded to become round. The form and structure of wooden material that arises from this manufacturing process accounts for a strong relationship to trees. Not because it is recognisable as being made out of wood, because that is typical to much wooden furniture, but because the curvature of its forms recalls the branches of a tree. A hybrid of chair and branch, the No. 14 activates a non-human becoming and introduces a particular sensation – a perception of the forest – into a consumer product.

This can be clarified by examining the difference between a No. 14 chair and other types of wooden chair in which a piece of timber is cut out of a tree and processed by straight saws, lathes, hand-carving or other subtractive production techniques. These techniques extract and isolate the timber from its origin within a tree. The timber that we touch on such chairs is perceivably the *internal* material of the tree – not necessarily something that connects directly to the sensory experience of a whole tree. Conversely, the pliability of the No. 14 chair draws to mind the thinness and flexibility of young branches or saplings because the components recall whole branches shorn of surface bark and bent into shape (though this is not actually how they are made). This perception develops from resemblance to common human experience; a familiarity with bending young tree branches through the experience of strolling in a forest or climbing trees as children, perhaps, or, at least, a familiarity with such things in picture



Fig. 12: Clyde Beatty (c. 1930s) from Harvard Library, President and Fellows of Harvard College. The chair appears to the Thonet No. 18 model 18 (1876), or a replica – good imitations of the Thonet chairs being widely available in North America by the late-nineteenth century (Harwood, 1994). The No. 18 chair is similar to the No. 14 except that the internal back support is vertically aligned. This structural difference may have motivated Beatty and English's preference for the No. 18, in that they grip this section to bring the chair legs up horizontally facing towards the lion. It is possible the No. 14 chair would not have offered the same grip or performance posture.

It may be that the potency of this force in perception has diminished since the initial popularity of the chair in the 19<sup>th</sup> century, but recent incarnations of the chair, such as the Thonet 214k chair (figs. 7 & 8) works to renew this original expression of plasticity, as do some contemporary, experimental derivatives (figs. 9 & 10).

The sensible force of plasticity is the result of an affective hybridity; the consequence of the power of steam and industry bound within the material of the forest. The Thonet No. 14 is a forest-factory-chair hybrid. This expression of factory and forest has broader ecological ramifications, notably the culpability of the chair in environmental degradation. Rawsthorn views the chair through the prism of contemporary

sustainability concerns, noting that the wood from early chairs was sourced from local forests and that factory tools were likewise locally produced (Rawsthorn, 2008), but at the time, during the first Industrial Revolution, natural resources were seen as being “immune to human activities” (McDonough, 2000). Alexander von Vegesack's research reveals a pattern of Thonet factories depleting local resources and the company subsequently opening factories elsewhere. The first factory relocated because of the cost of transporting wood to Vienna down the Danube. The replacement factory in Koritschan was chosen because of its proximity to “virtually untouched” forests of beech in Moravia (Vegesack, 1996: 32). Three years later, that factory was producing 200 chairs a day and a shortage of wood prompted the opening of another factory fifty kilometres away, closer to new beech supplies. Six years later, yet another factory opened in Hungary, its location near “huge beech forests” – by which point, the two older factories had depleted their local resources (Vegesack, 1996: 32–36).

A new materialist inquiry does not give attribution of these events to human, managerial decisions, but looks for non-anthropomorphic, non-intentional, material flows and processes. It is not that the factories should be praised for using local resources, but that that the factories, once hybridised with the forests, developed an agency to assert their hybridity, moving, like beech-eating machines, to locations that could feed their demand. This movement, an affect mediated process - the ‘feeding’ of a factory machine with wood – explicitly ignored national borders or boundaries of human design, and moved transnationally, guided by environmental conditions, forestry resources and waterways for the transport of wood. This is a transformative expression – the factory-machine, having been created by hybridisation with the materials of forest, expands by means of the forest.

This complicity in deforestation is sensible within the form of chair in the subjection of wood to the work of human and machine power. Just as this power moves in one direction to affect forest ecologies, it moves in another direction towards the consumer. It is sensible, in particular, in the use of the screws that lock curved wood components in place at the legs and seat. The wood is bent into shape by steam and industry, but it is not fully subjugated. A force of the forest preserves in the tendency of the wood to return straight and pull away over time, applying outwards force to the screws. This is considered normal and expected by Thonet, and paper labels are typically glued to the underside of the seat rim, advising the consumer to intermittently re-tighten the screws (fig. 11). That the screw is metal and made from machines is not what constitutes the affects of the factory within the chair, rather it is the force and action the screws apply to the chair to maintain its shape in use that reasserts the work of the factory. The screws maintain a presence of the factory-machine within the chair, however, it is incomplete without human labour. In use, consumers become bound to these forces by the act of intermittent re-tightening and in doing



Fig. 13 & 14: Pat English (1940). Photos by John Phillips for Time Life Pictures. The lightness of the chair enables English to grip gun and chair in the same hand. Retrieved from <http://www.gettyimages.co.uk/>



Fig. 15: Clyde Beatty and Pat English (1940), photo by John Phillips for Time Life Pictures. Claw marks are visible on the legs of the chair, indicating its robustness after prolonged use with lions. Retrieved from <http://www.gettyimages.co.uk/>

so the chair's human-forest-machine hybridity preserves from production into consumption.

The use of screws in the No. 14 is also consequential to the globalisation of the chair and its success in the tropical Americas. Michel Thonet had discovered that the animal-based hide glues of his day were unsuited to the tropics. Shipments of his earlier chairs had delaminated and come apart. The simplification of the No. 14 design with its small number of components held together only by screws enabled the spread of the chair into the tropics, expanding Thonet's market (Vege sack, 1996: 30 & 65). While this story has been interpreted in the discourse as a sign of Michel Thonet's intelligence and intentionality, from a new materialist perspective it is better understood as an example of an environmental force, a climatic condition, acting back on the role of materials in the design of products – the kind of actant that Bennett argues have tremendous capacity to affect human conditions (Bennett, 2010: 9, 24–28). This climatic agency describes a zone of transition and intensification – temperate to subtropical to tropical – that acts dynamically and in disregard of human convention. While Thonet would have measured success by the opening of one national market after another in the Americas, a non-anthropocentric interpretation is that an act of tropical selection opened a new, climatographically defined flow of beech wood. Already selected for its tolerance to steam, the hybridity of beech wood with screws capacitates new zones of inhabitation. Such interpretations don't change any particular facts, but reframe the history of the chair in different conceptual language to gain alternative insight into the design of products and their interrelation with the environmental.

Regarding consumer use, the preservation of the machine-forest hybridity, mediated by the haptic and kinaesthetic senses, found expression in new human behaviours. Thonet's pioneering technologies mean that, when lifted and moved, the chair is preternaturally light, stiff and rigid. So much so, that it was put to unexpected uses in dance, theatre and performance. One novel application was its use in the circus to oppose animal force: the chair was considered light and resilient enough to be used in lion taming (figs. 12–14). Thonet chairs are held in one hand as a defensive shield, the four wooden legs working to confuse the senses of the lion (Beatty, in Witney, 1995: 39–40). The chair becomes a prosthetic, an extension of the lion tamer's body, that serves to increase their size and power to the senses of the animal. The chair must withstand the incursions of the animal, such as a paw swipe or bite (fig. 15). This circumstance indicates the potential of products to enter into affective relationships with other things, such as performing animals, for which they were never intended.

The use of the chair in lion taming was, however, rare, and its exceptional lightness and durability had far more impact in more conventional human affairs – particularly in cafe culture. Historians have noted that the chair was as important as electricity to the spread of the cafe culture across Europe in the late-nineteenth and early-twentieth centuries (Flitch 2006: 21). The chair is referenced in descriptions of famous European cafes of the kind that fostered intellectual trends and revolutionary society (Grafe and Bollerey, 2007: 134, 181). The chair has been praised for its ubiquity as a “classless” object of cafe culture, found in equal use in upmarket and downmarket establishments (Grafe and Bollerey, 2007: 39–40). While this cafe culture may have begun in Vienna, as with the spread of Thonet factories across European forests, the movement of the chair as a cafe-culture object was also transnationally spread throughout Europe.

From the point of view of the manufacturer, the relationship between the *No. 14* and cafe culture is intentional and causal; in the late nineteenth century the company developed sophisticated marketing strategies targeting hospitality industries, including cafes, restaurants and theatres (Vege sack 1996: 41). From the perspective of an affect-based analysis, however, the material qualities of the chair, and the perceptions they potentialise, lay beyond the manufacturer's intention. A transformative agency of affect can be imagined in regard to cafe management and employees. For example, moving chairs up onto tables for floor cleaning, or in and out of cafes at opening and closing times, is made easier with light and strong furniture. Furthermore, the lightness of the chair makes it easy for customers to move chairs around, to join other tables and revel in de-stratified seating arrangements. These affordances transmit affectively from the chair's material properties into the action of muscles moving and lifting. The bodily sensation at the point of contact between person and chair – the interactivity of forces (such as the weight of the chair meeting the kinaesthetic receptors within human muscle) – potentialise a set of behaviour-modulating perceptions. These triggered behaviours could be: deciding to extend cafe opening hours, talking to a stranger, or performing with a lion. The inclusion of the broader social or cultural consequences of these is the concern of micro- and macropolitics, a Deleuzian-Guattarian concept of affect. Micropolitics is the field of interactions at the level of the human body that take the form of “micro-shocks”; small shifts in perception and consciousness that potentialise the larger-scale social behaviours that is the subject of macropolitics (Massumi and McKim, 2009: 4–6) (Deleuze and Guattari 1987: 213–16). Thus, lightness and strength, perceptions of material qualities captured by the encounter of wood with steam and industry, activate a series of affective possibilities that convert the micro-



sensibilities of a lion tamer or cafe manager into macropolitical characteristics of American circus culture or class mobility within European cafe culture.

The consumer popularity of the chair is an example of what Betti Marenko understands as the epidemiological and “viral” like potential of affective movement in market systems (working from the concept of passionate interests developed by the 19<sup>th</sup> century sociologist Gabriel Tarde) (Marenko, 2010: 144-46). This is to examine material products as triggers that propagate affective fields with the capacity to bind consumers into patterns of behaviours (Marenko, 2010: 139). Affective fields also occur in production and, through engagement with consumption patterns, trigger imitative behaviours that give rise to macropolitical conditions. The intense energies invested into producing and reproducing the chair is one example of these imitative behaviours. By the early 1890s, more than 50 companies were producing similar furniture throughout Europe and North America (Harwood, 1994: 92). The largest competitor, Kohn, had themselves twelve factories and over 6000 workers by 1904. Despite vigorous competition, Thonet continued to expand as well, and their workforce is documented as 7,000 employees by 1913 (Kyriazidou and Pesendorfer, 1999: 145). The Thonet workforce was sufficiently large to support the creation of schools, housing estates and shops for employees and their families, all provided by the company (figs. 16–18).

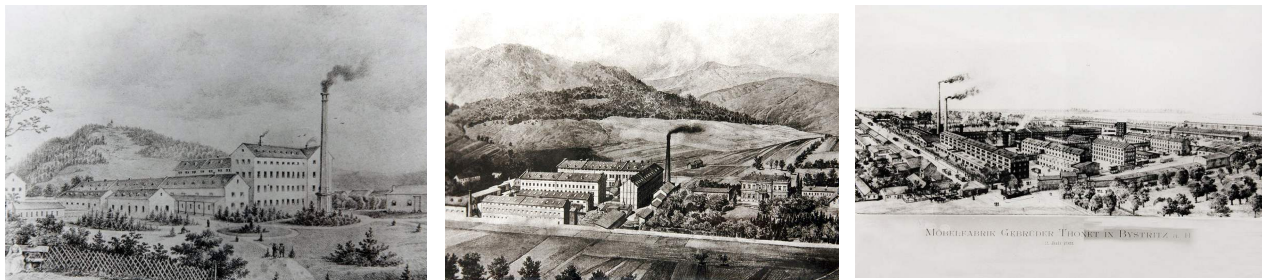


Fig. 16, 17 & 18: Thonet Factory at Bistritz. Top: 1873 ,middle: 1890, bottom: 1911 (Vege sack et al., 1996). This sequence of images indicates the expansion of the Thonet company at one of many locations



Fig. 19: Thonet factory in Bistritz showing standardized components of mass production c. 1920 (Vege sack, 1996: 70)

The monopolistic conditions of this service, accentuated by the issue of wages in a proprietary currency for the purchase of company-supplied goods and services, made employees highly dependant. Vege sack describes it as the actions of an “autarkic empire” (Vege sack 1996: 37). Thonet pioneering the “American” system of assembly line production, in which components were standardised across different chair models to obtain production efficiencies – observable in period photographs of the Thonet factory (fig. 19) and in Martino Gamper’s contemporary derivative (fig. 20). – is consequential to this situation. Workers were segregated by task and became machine-like in their specialisation. The system of production was also extended into the supply chain, for example by building their own train lines to decrease reliance on rivers and

waterways and more fully control the transport of forest resources. The flow of materials, from forests to machines, into components and products, became centrally planned and fixed. The human aspects of the process, the lives of workers, attuned to the factory machine by imitative behaviours within an affective field, likewise became fixed.

## Implications for understanding contemporary conditions

A key illumination of subjecting the No. 14 chair to a new materialist inquiry is the indication that contemporary production and consumption scenarios can likely be understood as also developing from material expressions and affective movements. The example of the Thonet empire demonstrates the historical relationship between such material expressions and macro-scale social and industrial conditions – a set of relations through which a thread of affects can be traced, however unpredicted it may have been at the time. Expressions in the use and consumption of contemporary products can, and probably should, be linked to material aspects of production. For example, in the case of consumer electronic products, such as telecommunication and computational devices, manufacturing and production conditions can be interrogated in



Fig. 20: Martino Gamper’s *Conran Collection* (2008) using standardized Thonet components in new configurations

regard to the global material flows from which they emerge – mined African metals, Arabian oil-based polymers, Asian component assembly, etc. – and in consideration of how these material flows express or articulate within design and use. And vice versa: how does design or use of an electronic device trace back to the environmental or labour conditions from which it emerged? To do so may help discover new ways of examining contemporary threats to social, cultural or environmental ecologies that, rather than being considered the fault of others or a consequence of self-interest or intentional design, are better understood at broader and deeper systematic levels addressing material relations between humans, things and ecologies. Critical illuminations may be otherwise unknown if investigative frameworks remain overly anthropocentric or focused on human intentionality.

## Acknowledgements

The author wishes to thank Dr Katherine Moline and Dr Anna Munster for valuable supervision and guidance during research for this paper.

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## Biographical note

Guy Keulemans is a multi-disciplinary designer, artist and researcher working across product design, graphics and installation. In his practice he produces critical objects informed by history, philosophy and experimental methodology. Major themes are repair, generative processes, and the environmental concerns of production and consumption.