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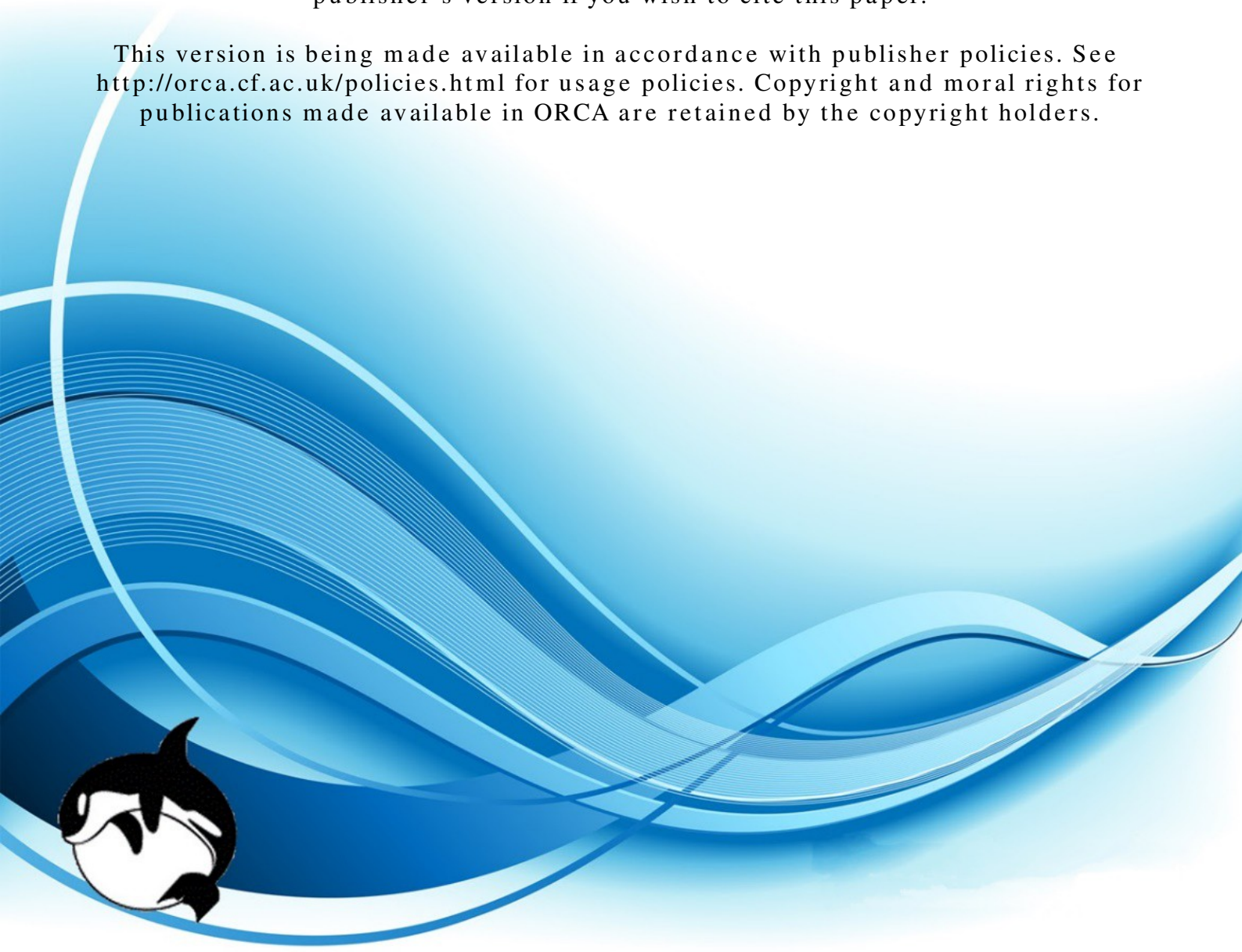

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The unstable lives of bicycles: the 'unbecoming' of design objects

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Abstract.

A predictable byproduct of any 'successful' mobility system is the breakdown and destruction of once desired, fashionable, shiny, and useful objects, yet mobilities scholars have largely ignored such issues. In this paper we document and analyze ethnographically neglected and 'half-dead' bikes in Copenhagen as we encounter them in racks, on the pavement, and when the municipality attempts to clear them out or recycle them. We are theoretically informed by ideas that see consumer objects as having a social and material life beyond their initial production and sale. They are constantly in a process, (un)becoming, and marked by that life. Where cycling is normally conceived of as a sustainable and environmentally friendly practice, this study shows that many bikes are ill treated and quickly become waste, and 'matter out place'.

Keywords: bicycles, design, ethnography, waste, repair, maintenance

Introduction

Cover photographs of 'mobilities books' tend to depict shiny cars, trains, and planes or people in fast (sometimes blurring) movement (Adey, 2009; Elliot and Urry, 2010; Sheller and Urry, 2004; Urry, 2007). Yet on the cover of *After the Car* (Dennis and Urry, 2009) there is a rusty and defective car abandoned in a field, seemingly discarded or forgotten. It captures a *future* state where the system of cars has collapsed and cars will rust away and 'haunt' Western cities as vacant factories do in former industrial hotspots such as Detroit and Manchester (Edensor, 2005). Rust and immobility here symbolize the fading power and allure of cars.

A more mundane and less future-oriented reading of Dennis and Urry's cover could accentuate the changing materiality and *life cycle* of *all* mobility designs. While cars enter the streets as shiny and functioning design objects they will, over time, due to use and the weather, become objects of wear and tear. This process is speeded up if they are poorly maintained and parked outside. Such designs consist of 'materials' (Ingold, 2007) that are in process—of rusting, decaying, falling apart, and becoming waste, or of being repaired or conserved [as Edensor (2011) and Strebel (2011) discuss with regards to buildings and Gregson et al (2009) concerning domestic objects]. This is not necessarily a sign of system failure (the argument in *After the Car*) but of 'productivity' and presence on the street. A predictable byproduct of any 'successful' mobility system is the wearing down of once-desired, fashionable, shiny, and useful objects, as well as repair attempts to mitigate this process. Yet, we argue that mobilities scholars have largely ignored the organic materials that constitute such designs, how they break down and become waste, especially if they are not subject to repair work and maintenance work.

Finally, the cover's 'stillness' intrigues us. Mobility designs have mainly been analyzed as designs that mobilize people and cities. Mobilities book covers, as noted, depict movement. A partial exception is the new *Routledge Handbook of Mobilities* (Adey et al, 2013) with its empty train wagon, seemingly garaged. It looks newly cleaned. Or perhaps it awaits repair? And yet none of the twenty-five chapters in the handbook explores parking, maintenance, or repair. In particular, cars and bicycles *routinely* spend far more time 'moored'—parked and spatially fixed—than on the move. The spaces and politics of parking and waiting are strangely neglected in the mobilities literature and beyond (but see Aldred and Jungnikel, 2013; Hagman, 2006; Henderson, 2009; Larsen, 2015).

The mobilities literature is not blind to 'stillness'; it has eyes for erratic 'turbulences' (Cresswell and Martin, 2012) such as abnormal weather conditions. Flooding, hurricanes, and heavy snow disrupt the ordered flows of mobilities, causing delays, accidents, and disruptions. Major turbulences include Hurricane Katrina in New Orleans in 2005 (Hannamm et al, 2006), the Icelandic ash clouds in 2010 that for a week or so shut European airspace and sent disruption rippling worldwide [see special issue of *Mobilities* **6**(1)], and the storm off the south coast of England in 2007 that grounded a container ship on the beach (Cresswell and Martin, 2012).

Less discussed are those *smaller* 'turbulences' that recurrently affect everyday mobilities. Cars and bikes, from time to time, run less smoothly and break down because of rusty chains, flat tires, defunct motors, and so on. They are immobilized and await repair work. Thus, we argue that the material life and 'stillness' of mobilities need to be analyzed. In a previous article one of us has explored designs and practices of parking bicycles in Copenhagen, Amsterdam, and New York (Larsen, 2015). Two striking features of that fieldwork were, firstly, the sheer number of parked bikes on pavements and, secondly, that many of them were rusting, broken, stripped, and vandalized. In the present paper we document and analyze ethnographically such unstable, neglected, and 'half-dead' bikes in Copenhagen, as we encounter them in racks, on the pavement, and when the municipality attempts to clear them out. We are inspired by Aldred and Jungnikel's observation regarding English cites: "a common theme was concern about the bicycle when *not* in use. Bicycles at rest were perceived as threatened or threatening, risky or at-risk; affected by theft, vandalism, the weather, official and familial disapproval" (2013, page 609). Based on our field study in pro-cycling Copenhagen, we add that parked bicycles are endangered by, and become waste because of, a lack of, and interest in, professional and DIY repair and maintenance as much as theft and vandalism. This is a general problem in Copenhagen, although it is most apparent in densely populated neighborhoods with many smaller flats and younger people.

In doing so, this paper offers new insights about the unstable materials and lives of bicycles as everyday objects. Cycling is normally conceived of as a sustainable and environmentally friendly practice (eg, Banister, 2008; Horton, 2006) but this study shows that many bikes are ill treated and quickly become waste, and 'matter out place' (Douglas, 2013) on the pavements. In what follows, we begin by discussing relevant research about the lives of consumer objects, waste, and maintenance work. This informs our 'ethnographic' vignettes from Copenhagen on its many mistreated, vandalized, and seemingly forgotten bicycles. So,

this paper largely excludes well-maintained and expensive bikes parked inside flats and basements [see Bradtberg and Larsen (2014) for an account of such bicycles in Copenhagen].

The lives of consumer objects

We are theoretically informed by ideas that see consumer objects as 'becoming' and having a social and material life beyond their initial production and sale (Gregson and Crewe, 2003; Gregson et al, 2009). They have a social life as and when (different) people invest identity and emotions in them over time, especially when they are bought, used regularly, and later discarded. Some discarded objects gain a new lease of life if recycled, passed on to friends, or sold at charity shops, at flea markets, or on the Internet (Gregson and Crewe, 2003). They have a material life as they break down and stop working. They are unstable and aging: prone to scratches, general deterioration, and becoming obsolete. Crang calls this "the negative unbecoming of things" (2012, page 60). Design objects are not things, but a complex *assemblage* of many separate materials (Ingold, 2007) skilfully 'assemblaged' as a unified design (Gregson et al, 2010, page 848; see also Edensor, 2011). Bicycles, for example, are made from numerous materials, including plastic, iron and steel, and rubber, and consist of countless components such as frames, saddles, wheels, seat posts, handlebar grips, head tubes, brakes, spokes, hubs, rims, tires, seat stays, chains, front derailleurs, chain rings, chains, pedals, crank arms, cogsets, rear derailleurs, mudguards baskets, locks, lights, and much more. However, when living 'rough on the street' the materials of assemblages are constantly '(un)becoming' as elements are broken or stolen.

This reading of objects as assemblages implies that, over time, design objects such as bikes can mutate and become 'something else': when, for instance, existing parts are broken or replaced. Assemblages, as Edensor points out, are: "never stable, closed and secure 'black boxes'. Although the constituent elements of a heterogeneous assemblage are enrolled to stabilize and order space and materiality, they are susceptible to entropy and disordering" (2011, pages 238–239). This unbecoming is also seen when waste is discarded and the very materials of things are scrapped and recycled. Such a theoretical framework allows us to take bicycles seriously as material objects and explore their complex life-biographies:
(1) as energy-intensive and polluting *consumer objects* that are designed in the West, and produced in China or elsewhere, shipped to the West and sold as shiny commodities in 'local' shops;

(2) as *everyday* objects that are used, maintained, and repaired, but also subject to wear and tear, neglect, vandalism, and theft;
(3) as *discarded, rubbished, and stripped* objects living neglected lives in racks and streets;
(4) as *'disorderly' waste-objects* that require costly removal by municipality maintenance staff and later scraping;
(5) as *second-hand* gifts passed on to friends and family, or charity, or sold cheaply at car-boot sales and charity shops or expensively at high-end second-hand shops and markets;
(6) as stolen goods when bikes, or parts of bikes, are stolen for private use, resale, or in the assemblage of new bikes;
(7) as discarded and deassemblaged materials that are scrapped and reused in the production of new designs.

Waste

The above list highlights ways in which objects can become discarded and 'wasted'. Research increasingly highlights how mobilities are great producers of pollution (Urry, 2011) and waste (for an overview, see Swanton, 2013). This can be illustrated with *virtual* mobilities (Urry, 2007)—eg, e-mails and photo calls—that are not as 'sustainable' as first imagined. Electronic waste (e-waste), as Graham and Thrift write, "is the fastest growing segment of the overall waste stream" (2007, page 19). Mobile phones, computers, etc are resource intensive to produce and many kilos of hidden resources go into their production. They depend upon scarce minerals located in conflict-ridden countries like the Congo where they have fuelled war crimes and violations of human rights (Sutherland, 2011). They are produced—like most other consumer objects—in 'distant places' in the East and their transportation depends upon massive container ships, which consume a great deal of fuel (Urry, 2014).

The Internet and 'gadgets' consume electricity and generate mountains of e-waste, which again consume energy. Information technology is responsible for roughly the same amount of global CO_2 emissions as all the aircraft companies combined: namely, around 2% (http:// www.information.dk/282929). To make things worse, they are used only for short durations— less than a year for mobiles (Graham and Thrift, 2007, page 19; Gabrys, 2011). Consumer objects are increasingly designed to have short lives so that new designs can be purchased. They break easily, foreclose repair, and update poorly while a constant stream of

new models makes existing ones appear outdated and unfashionable almost overnight (Graham and Thrift, 2007, page 18). This is "planned obsolescence" (Gregson et al, 2007, page 697; see also Cooper, 2005, page 57; Slade, 2007), and is linked to the intensified production of consumer desires, of a speeded-up capitalist postmodernity (Bauman, 2007; Harvey, 1989; Lewis, 2013) where we are "victims of the morbid cycle of repetition, novelty and death" (Edensor, 2005, page 315). As Bauman writes:

> " The society of consumers devalues durability, equating the 'old' with being 'outdated', unfit for further use and destined for the rubbish tip. It is by the high rate of waste, and by shortening the time distance between the sprouting and the fading of desire, that subjectivity fetishism is kept alive and credible despite the endless series of disappointments that it causes. The society of consumers is unthinkable without a thriving *waste-disposable industry*. Consumers are not expected to swear loyalty to the objects they obtain with the intention to consume" (2007, page 21, our italics).

What Bauman calls "waste-disposable industry" is discussed by geographers such as Moore (2012), Davies (2012), Crang (2010), and Gregson et al (2010); they explore the material and economic *afterlife* of waste across different spatialities. Waste is not necessarily final and fixed (Gregson et al, 2010, page 848). For instance, Gregson et al (2010) 'follow ethnographically' 'end-of-life' containerships that are sailed to beaches in Bangladesh where they are 'disassembled' or 'unmade': things deemed valuable are recycled in local furniture businesses while the ships themselves are scrapped and sold as steel scrap (Crang, 2010; Gregson et al, 2010). This is part of a wider 'offshoring' where waste is both a burden and an economic resource (Graham and Thrift, 2007; Urry, 2014). Even the abandoned car discussed in the introduction will probably be scrapped to extract the steel and aluminum and be recycled in new objects [see Moore (2012) for a general review of different geographical approaches to understanding waste].

However, discarded or unwanted Western consumer goods also gain new economic vitality and lease of life when they are passed on to friends and family members (for example, children's clothes that are outgrown before they are outworn) or sold as second-hand goods in charity or vintage shops. Studies of second-hand cultures show how things can move in and out of a commodity state through their lives (Gregson and Crewe, 2003; Gregson et al, 2007; Hetherington, 2004; Parsons, 2007; Thompson, 1979). Contrary to the idea of a 'throwaway society', many things are recycled and kept, as 'throwing out' useful things is considered, at least by some, as amoral and wasteful. And it can be heart breaking to discard

objects or ‘home possessions’ (Miller, 2001) of affection; no matter how outdated (the rest of the world may consider them). In their research, Gregson et al find that:

“whilst people certainly did get rid of consumer objects via the waste stream, they also went to considerable lengths to pass things on, hand them around, and sell them, and just as often quietly forgot about them, letting them linger around in backstage areas such as garages, lofts, sheds, and cellars, as well as in cupboards and drawers” (2007, page 683).

So many ‘outdated’ objects are not properly binned but live half-forgotten and semiwasted lives back-stage. Yet they may be rescued from binning by lingering back-stage. This may be the case with large vinyl collections and photo albums that are ‘out of place’ in many ‘digital family homes’ (Larsen, 2014; Larsen and Sandbye, 2014; Reynolds, 2011). People are not only throwing out ‘waste’, but also living with their own and especially with other household members’ semidiscarded objects that cause clutter and dust.

Maintenance work

Another ‘waste-disposable industry’ is maintenance work. Graham and Thrift (2007) critique social theory for focusing upon ‘systems’ that ‘work’. Maintenance and mending are equally crucial because systems and things decay, break, and fail:

> “All infrastructural systems are prone to error and neglect and breakage and failure, whether as a result of erosion or decay or vandalism or even sabotage. Indeed, many such systems are premised on a certain degree of error or neglect or breakage or failure as a normal condition of their existence” (page 5).

Graham and Thrift note in particular how things and cities, day in and day out, decay a little, being exposed to all sorts of human and nonhuman practices, pollution, wildlife, and weather. Things are always becoming and in the process of decaying. If unmaintained they will, sooner or later, become waste, as Edensor (2005) shows with regards to industrial ruins. So, Graham and Thrift argue that: “the world is involved in a continuous dying that can only be fended off by constant repair and maintenance” (2007, page 6). Edensor notes how a building, with reference to an old church, is “simultaneously destroyed and altered by numerous agencies, and stabilised by repair and replacement building material” (2011, page 243). The church is constantly in a *process* as various humans and nonhuman agents—for instance, the weather and insects—act upon its stony fabric. Without careful and meticulous

maintenance and repair, the church would deteriorate—like the much younger industrial sites and the car in the field. While set in stone, a church requires nursing to remain alive.

Maintenance and repair work are thus part of an *ordering* project aimed at maintaining designs at their peak and clearing them off when deemed waste. Once defined as waste, designs become 'matter out of place' that undermine order. Decaying industrial sites are, when seen through the prism of order, 'disorderly ruins' (Edensor, 2005). Social, spatial, and material order requires continual maintenance (Edensor, 2005, page 313; Hetherington, 2004, page 159).

So far we have discussed maintenance and repair of 'big designs'. What about everyday designs? Professional repair is in decline because of high labor costs; the cost of repair sometimes exceeds the price of a new object/model (Gregson et al, 2009). DIY repair is probably also declining because many designs foreclose repair. Yet Gregson et al argue that "in a very real sense object maintenance drives the consumer world, much as Graham and Thrift (2007) have argued that it constitutes the city" (2009, page 268). They examine the repair and especially maintenance work that individuals perform when dusting, vacuuming, and cleaning cherished home possessions: "these practices endeavor either to keep consumer objects in or return them to their pristine state (as when new), to freeze the physical life of things at the point of acquisition and to mask the trace of consumption in the object" (2009, page 5). Maintenance and repair work can also be a source of improvization and innovation (Graham and Thrift, 2007). This is seen when people or professionals upgrade designs or restore vintage designs. Such DIY repair requires 'competences' (Watson and Shove, 2008) and interest in doing such work.

Inspired by the discussions above, in what follows we explore the social and material life of bikes in Copenhagen. In other words, how are 'parked' bikes treated in this iconic cycling city? We are particularly interested in examining how Copenhageners treat their own and others' bikes, by attending directly to the very 'materials' of bikes and their assemblages, as well as their constant 'becomings' and 'unbecomings'. Our analysis is based on a twelve-month (from 2 February 2013 to 2 February 2014) ethnographic study comprised of observations, visual documentation, and interviews with cyclists and municipality staff. The study took place in Vesterbro, a gentrified residential neighborhood where cycling is very common and also where the central main train station is situated. We focused our study on bicycle parking areas located just outside the main train station as well as on eight smaller residential streets, some of which have smaller shops and supermarkets, in two different parts

of the neighborhood. On each of these streets, we observed, filmed, and photographed bicycles, and in particular their vital parts and materials, oiled and dried-out chains, rock hard and flat tires, rusty parts, and broken and missing bits.

These observations are complemented by thirty-five short interviews with 'ordinary cyclists' at parking racks at the main train station and a nearby supermarket. The interviewees were recruited on the streets as they parked their bikes, and were offered anonymity as part of their participation. The interviews revolved around bike ownership, emotional attachment to bikes, and practices and competences of maintenance and repair.

Following this discussion is a vignette that illustrates how the Municipality of Copenhagen regards the many half-dead bikes as 'disorderly waste' and undertakes laborious maintenance work to remove them. Inspired by ethnographies of things-as-materials and 'waste disposable industries' (Gregson et al, 2010; Lane, 2014), we 'follow bikes' as the municipality removes them from the streets of Vesterbro. This takes us 'down the value chain' to the scrap sites where most of these bikes end their lives as scrap metal and 'up the value chain' or 'waste hierarchy' (Gregson et al, 2013) at police auctions where the most valuable bikes are auctioned. We have interviewed and exchanged e-mails with the municipality officers in charge of this operation and have on two occasions 'traveled along' with the municipality team as they taped, removed, and disposed of bikes from the streets of Copenhagen. The municipality has provided us with statistics about how many bikes they collected, recycled, and scrapped from 2008 to 2012.

Bikes in Copenhagen

Small bike shops selling and repairing bikes are everywhere in Copenhagen, with less than 150 m between them in one particular neighborhood (Nordstrøm, 2013, page 48). Many larger supermarkets sell cheap bicycles. They all sell a mix of Danish and international brands but they all have considerable 'carbon footprints'. A mere 2800 bikes were produced in Denmark 2012 (by companies with ten or more employees) (Rühne, 2013) . This compares with 105 000 in 2007, which reflects a global trend with most bikes being produced in China or other low- wage countries (http://www.worldwatch.org/node/5462; Vivanco, 2013, pages 46–47). There are no available statistics about the average price of bikes sold in Copenhagen, but they seem to cost between £350 and £600, less in supermarkets and more in racer cycle

shops. By Danish standards, this is not a fortune, especially compared with cars that easily cost around twenty to thirty times as much (new cars are heavily taxed in Denmark).

There is a striking contrast between observing—especially *parked*—bicycles in bike shops and out on the streets of Copenhagen. Their shiny newness, of polished surfaces and intact pieces, evaporate and mutate into rust, scratches, dirt, and missing parts. This 'deassembling' even characterizes newish-looking bikes. Premature ageing haunts surprisingly many parked bikes in Copenhagen. They look, generally speaking, neglected compared with the neighboring cars, so neatly parked and maintained. Many bikes have ingrained dirt, dried- out or sloppy chains, rusty parts, scratches, semiflat tires, and missing, broken, or bent parts. Passers-by use bike baskets, especially on trashy bikes, as garbage dumps. If cigarette packets, cans, and greasy junk food paper are not removed immediately, the bike will soon mutate into a garbage tip. Few seem to care much about their own or others' bikes.

This woeful state of bikes in Copenhagen is partly the result of cheap materials that easily rust and break. But they are also systematically mistreated and vandalized by various human and nonhuman 'agencies' that act upon the very materials of bicycle assemblages. One such 'agency' is insufficient and poor parking. Cycle racks are designed to produce an *orderly* space, with rows of bikes neatly placed next to each other.

Figure 1. [In color online.] Bike rack chaos.

Yet every so often chaos reigns. One inherent design problem with *grid* racks (*the* rack type in Copenhagen) is insufficient wheel attachment and support. This causes 'turbulence', with bikes falling when touched by the wind or a parking cyclist. This triggers further turbulence—*a domino effect*—where one falling bike takes down several others. A notorious shortage of grid racks in Copenhagen only aggravates this problem. Bikes are bent, broken, and scratched (see figure 1). The widespread use of stand props also causes 'turbulence'. They conveniently provide ubiquitous parking without leaning against, or being supported by, a rack or street furniture, right at the destination. The downside is that they are easily tilted and knocked over. Walking often implies avoiding fallen bikes [for more on this, see Larsen (2015)].

The weather is another destructive nonhuman 'agency'. Rain and snow (as well as antifreezing road salt) cause rust, and both weather conditions prevail in Copenhagen. Visible rust outbreaks are seen on most metal parts of parked bikes, eating them from outside in, especially in all the scratches.

Theft is a negative human 'agency'. Stripped bikes, without pedals, or gears, or wheels, or handlebars, or even frames, haunt most bicycle racks and they are always at the mercy of a new round of bike 'vultures'. Locks and wheels are likely to be damaged during theft and a bike is 'thrown somewhere' when the opportunistic thief no longer needs it or feels remorse. Bike theft is much more common than car theft (see Larsen, 2015) and almost all the interviewees had experienced it. Indeed, this was the *major* reason for buying (or inheriting) their present bike. Their old bikes were not worn out or needing replacement. The risk of theft discourages/d the interviewees from investing in high-quality bikes and maintaining and becoming attached to their present bikes (see below).

Another destructive human 'agency' is that of treating pavements and racks as spaces of storage and refuse. Garbage is never placed on the pavements in Denmark [in contrast to many cities: for instance, Melbourne, where there are weekly kerb-side collections from bins (see Lane, 2011, page 398)]. Garbage belongs in designated back-stage areas (eg, courtyards), out of sight and smell. Yet many parked bikes seem to be 'forgotten' or misplaced by their owners, literally in the process of decaying and becoming waste. Perhaps people are not quite ready to bin their (stripped) bike or they cannot be bothered to throw it

away properly. They linger on the street similar to, as pointed out by Gregson et al, semiforgotten things in garages, lofts, sheds, and cellars (2007, page 683).

Arguably, however, the major destructive 'agency' is lack of maintenance routines and skills. Our interviewees put hardly any effort or pride into bike maintenance. Several said that maintenance would only make theft *more* attractive [see similar findings by Aldred and Jungnickel (2013)]. The interviewees did not talk about practices of polishing and washing bikes (as Gregson et al discovered in their study of domestic objects) or DIY and craft skills, as Watson and Shove (2008) noticed in relation to 'home improvement'. And there are no 'systems for bike maintenance' such as 'car washes' at petrol stations, nor compulsory MOT tests for ageing cars.

Few talked about having basic DIY bike repair skills. Most visit a bike shop around the corner for smaller repairs, such as a flat tire. Given the high cost of such repair work (the hourly rate is around £35), few invest much in repair in a cheap shabby bike when a new bike is only marginally more expensive. However, according to interviewees, the lure is not the latest version but a rather a new version of the same or a similar bike. Bikes are in this respect less victims to 'planned obsolescence' than are mobiles and laptops. As one middle-aged woman said when she was asked what was wrong with her old bike since she had bought a new one: "It got stolen. I had the same model before but it got stolen, so I replaced with the same model." Many interviewees have detached relationships with their bikes, which are just bikes that might be 'wounded' or even gone by tomorrow. Little money, emotion, and maintenance are invested in such 'ordinary' bikes. As one woman said: "I have a bicycle from Kvickly [a Danish supermarket]. Because I got tired of having bikes stolen all the time. They were much nicer." Another stated that she had bought her present bike "because it was cheap" so "that it wouldn't get stolen". They are means of transport and have little identity or lifestyle value because the wider environment makes it difficult to develop such a relationship. This is in contrast with many 'home possessions' that are much easier to protect and therefore develop affection for over time (Gregson et al, 2013).

All these 'agents', in combination, cause an ongoing stream of small-scale turbulences and spatial disorder that produce abandoned, immobile, and ownerless bicycle in great numbers. Moreover, they illuminate their unstable nature. These agencies destabilize and mutate bicycle into discrete materials—even *before* they are scrapped. Observing such not- yet-end-of-life bicycles show that they "are not just singular objects but simultaneously multiple, heterogeneous things and materials" (Gregson et al, 2010, page 847).

The 650000 bicycles in Copenhagen means that a great deal of parking space is needed, and streets and racks brimming with bikes are the reality today (Larsen, 2015). This overcrowding represents a practical planning problem of 'waste and matter out of place' (Moore, 2012, page 786). Abandoned, immobile, and ownerless bikes disturb the smooth running of things (Moore, 2012, page 781). The Copenhagen Municipality estimates 'conservatively' (based upon the sale and theft statistics) that 40 000 bicycles are abandoned every year on the streets, courtyards, and racks (Nielsen, 2012). The bikes also, to some degree, become objects of irritation amongst cyclists and pedestrians, blocking pavements and exits.

Bikes also mobilize irritation because they ruin the clean image of both cycling and Copenhagen. Abandoned bikes may not smell and be a health hazard, but they look trashy and disorderly. Trashy bikes on pavements are simultaneously 'in place' and 'out of place'—similar to, say, out-of-date food in a fridge. They are wasting 'loudly' on their own 'front-stage' (recall Gregson et al above). Abandoned bikes are a (visual) waste problem and a space problem, calling forth maintenance work, according to the municipality. This reflects more broadly that waste is 'political' and "a becoming process between matter-out-of-place and matter-in-place" (Pikner and Jauhianien, 2014, page 47).

We turn now to how the municipality collects 'dead bikes' in practice. The process is similar to the manner in which bikes are collected in train stations and 'from below' by private flat owners in the communal spaces of apartment buildings (eg, courtyards and basements). In short, everyone must follow the police guidelines surrounding the collection of abandoned bicycles [for another study of collective clearing out 'from below', see Pikner and Jauhiainen (2014)].

Maintenance work

The municipality spends, according to the municipality officer responsible, some £240000 annually on a special bike refuse unit (e-mail, 16 March 2013, and telephone conversation 22 May 2014), which is separated from other garbage and maintenance duties (eg, emptying public waste bins and sweeping the streets). Between 2008 and 2012 the municipality has collected some 6426 bicycles yearly on average, according to its own spreadsheets (our calculations based on the municipality's own statistics). In addition to the municipality, the train company DSB and the police collect 16 000 bikes a year (Nielsen, 2012). There is thus a

steady flow of new bike waste. The municipality estimates that 10–12% of all bikes found in public are abandoned (Nielsen, 2012).

Yet the *cultural* and *legal* status of the bike in Copenhagen makes this maintenance work difficult, time consuming, and ineffective. First, as argued, many bikes in Copenhagen are marked by wear and tear, lacking repair and maintenance. It is difficult to detect whether a bike is abandoned or not. The bikes do not reveal their 'social biography'. Second, by law, bikes are 'untouchable'. It is illegal for shop owners and others to remove bikes even if they block shop windows or façades (Larsen, 2015). Not even the municipality is allowed to remove a fly-parked bike from, say, the pavement to a nearby rack or to bin a rusty bike. However, from March 2013 it was permitted, on a trial basis, for authorized municipality personnel to remove bikes to a nearby place if the bikes were blocking emergency routes and passages. Yet the municipality is still obliged to inform the owners where they can pick up their bikes.

Bikes are largely protected and 'free-riding' objects on the pavement. This is unlike most other abandoned objects that are subject to immediate removal. Not even cars have the same protection as bikes. Car parking is strictly regulated through (sometimes considerable) payment, time zones, parking signs, parking meters, traffic wardens, and rules about parking and fines (Hagnam, 2006; Henderson, 2009). Cars with no or invalid tickets will be fined and eventually clamped. The owner can be tracked down due to the personalized registration of cars (eg, number plates). In contrast, cycle parking is unregulated and free of charge, and bike ownership is not registered (Larsen, 2015). Although, by law, all bikes sold in Denmark have to have a unique serial number engraved into the frame (and this number has to be stated on the receipt), the bike is not registered with the authorities. A '(littering) bike' cannot be traced to the owner. How, then, does the municipality go about cleaning-out and recycling 'dead' bikes? Analytically, we divide the work into: preparation, identification, separation, removal, and afterlife.

Preparation

Maintenance work involves planning. The renovation team's long-term planning involves ensuring that they systematically 'clear' exposed locations such as train stations every few months, and different neighborhoods yearly or every second year. In between it does more ad hoc collections at notorious spots. We focus here on the planned, systematic clearance.

Figure 2. [In color online.] Municipality poster.

Detailed maps divide neighborhoods into manageable areas of some twenty streets. These units are then given a timeframe of five weeks to be cleared. When an area is next on the schedule, an employee cycles to the area (on an electric bicycle) and hangs posters (see figure 2) on all the doorways. These inform residents that:

> " This street will be cleaned of dumped bikes and the remains of bikes ... . Copenhagen Municipality would like to make an effort so that your

> neighborhood appears at its best— as a cosy and tidy place. Therefore, we will clear out bikes in the area marked on the map."

The poster describes how all bikes will be taped with yellow tape from a specific date. Residents are asked to remove the tape from their—or their holidaying neighbours'—bike if still in *use*.

The municipality promises residents that the maintenance work will have a positive outcome for their neighborhood; it will become a 'cosy and tidy', ordered place. However, the poster says nothing about 'recycling' and it is evident that such bikes are not regarded as a potential resource. We also see that the municipality distinguishes between and targets different bike assemblages as part of the garbage work: namely, 'dumped bikes' (ie, without an owner, because they have been abandoned by their owner or separated from them due to theft) and 'bike remains' (eg, broken or 'stripped'). The former can, in principle, be a new and working bike, which does not look like trash. Yet it makes sense to include the former, because, as discussed above, many working consumer objects are prematurely discarded. Moreover, many stolen bikes are not sold but dumped when no longer needed.

This procedure reflects the fact that the law states that *everyone* (except the police) needs to give four weeks' *notice* before they can legally remove bikes. It also reflects a concern within the municipality, we are told by refuse collectors, that disposing of bikes that are still being used and valued by the rightful owners jeopardizes the legitimacy of the project (field notes, 29 May 2013, 9 July 2013). It would, so to say, turn the municipality into a thief. The posters and tape minimize that risk.

Identification

The employee indiscriminately fastens yellow tape around *every* single bike, one after another. A 200–300 m long street can easily hold several hundred bikes and to tape each of them takes hours. Staff bend a little forward and tape together one of the wheels and mudguard (standard equipment on Danish bikes) with some narrow yellow tapes with the municipality's logo (see figure 3). This is a clever design that automatically unseals when used, independently of whether the owner notices it or not. If the tape is broken, the bike will be regarded as 'in use', whereas intact tape is *the* indicator of bikes-to-be-wasted. This is taken as a sign that it is either immobile (eg, not in use) or/and ownerless. The waste status of these bikes is a spatial–temporal one: they are still in the same place for more than four

weeks. This challenges ideas that disposal and waste are purely spatial categories (Hetherington, 2004; Parsons, 2007, page 391).

The in-between period

Slowly, during the four weeks, there are fewer and fewer taped bikes in the streets. This is according to the script if they are released through *use*. However, the tape can break against the 'script'. Some may remove the tape from their stationary nonworking bikes because they plan to repair them one day. Youngsters may remove the tape as a prank. Therefore immobile bikes will most likely still occupy sought-after space after clearing. At the end of the period, a taped bike may encourage theft, especially those bikes that are already unlocked due to recent theft. Some may find such theft legitimate since the bike is going to be scrapped anyway: in fact, they keep the bike alive by stealing it or some vital 'organs'. One of us, for example, fell in love with a beautiful 1970s European racer that with a good dose of repair and some new parts could become a real vintage beauty.

Figure 3. The yellow tape.

Having been taped for four weeks it was destined for scrapping. The night before clearance it disappeared. This reflects the fact that vintage bikes from the 1970s and 1980s are fashionable amongst cool young people (Haddon, 2012; Weis, 2013). Clearly, this was not

the only soon-to-be-discarded bike that was scavenged during those four weeks. This is despite the fact that it is illegal and might be stolen property (the engraved steel number is seldom 'unbecoming').

Lane's (2011) study of hard rubbish collections on pavements in Melbourne showed that 35% of stuff was scavenged prior to collection by the municipality. However, while the Melbourne residents were a little unsure if the practice was actually legal or not, pavements and nature strips are regarded a legitimate place to acquire stuff during the announced period and there was no fear of acquiring stolen property or committing a crime (Lane, 2011).

On the announced day of the actual clearing, five weeks after the notice, most tapes will have been unsealed. To our surprise: "the tape had disappeared on many, many poor and even 'scrap-worthy' looking bikes" (field notes, 29 May 2013).

Separation and removal

After five weeks the actual disposable work can begin. This phase can be further divided into a recycle and scrapping phase. Based on our observations as we traveled with the refuse team one of us wrote:

> " First, employees trained in bike mechanics walk the streets, assess and pick those bikes with the recycle exchange potential of making at least £60 at a later auction. These selected bikes are registered manually in a digital tablet system. Only functioning and intact bikes (of known brands) are selected, while valuable and functioning parts are overlooked. We are told that it is not worth picking less valuable bikes or parts due to the expenses involved in handling them" (field notes, 29 May 2013).

Most bikes are not worth around £60 after 'living rough' on the streets of Copenhagen. We observed that most bikes to be scrapped were inexpensive supermarket bikes or middle-range brands, victims of what appeared like a few years of wear and tear. Even fairly new (especially cheaper) supermarket bikes were snubbed, not deemed worthy of 'moving up' the value chain, unless in perfect condition. Moreover, many functioning parts that could easily become 'vital cogs' in a new bike assemblage are relentlessly overlooked and head to the 'scrap graveyard'. The 'chosen few' deemed fit for reuse are then driven to a storage facility where are they are immobilized for another four weeks of waiting (see later).

All the remaining bikes are indiscriminately destined for scrapping. We were initially surprised to realise that the vast majority are considered nothing but waste. Clearly many of

them are in very poor condition but equally many are little or no worse than many in-use bikes. With a little maintenance and repair many would even be in a better state than most other street-residing bikes. Furthermore, our observations suggest that few of these bikes are unlocked or appear to have been stolen, based on the state of their O-locks [the common lock in Copenhagen (see Larsen, 2015)]. This suggests that many abandoned bikes are neglected and forgotten rather than stolen goods.

Then an employee registers all the taped bikes in a tablet. This is partly to keep track of the overall work and partly to organize the forthcoming removal. Then the renovation team arrives on one of the following days with a lorry to pick up the many registered bikes, taking one street after another. The diary extract below gives a sense of how clearing takes place at a small residential street where most bikes are parked with stand props or by leaning against house façades:

"The tablet states that on the next street there are a handful of bikes awaiting removal. Just enough to fill the load! The driver navigates the one-way streets; turns the corner and scouts after bright yellow tape, signalling us to stop. Five bikes stacked together are spotted. This is a few less than the tablet says. They must have gone missing! They are loaded onto the back of the lorry in a matter of minutes. And this is despite the fact that they are all locked! The many bikes with O-locks are simply lifted by the back wheel and rolled onto the lorry. These locks are so easily undone by a human hand. The few bikes that are 'moored' to something with quality u-locks or chains, it turns out, are almost equally impotent when facing a professional bolt cutter. They are lifted within seconds! I count twenty-five bikes on the lorry now. Then we inspect the whole street by foot to make sure that we do not miss some. Another four bikes are found and they are squashed in together with twenty-five other bikes. The pick-up request is 'cancelled' on the tablet and it is updated with the number of bikes collected. We leave the street and drive directly to the scrapyard" (field notes, 29 May 2013).

Clearly, this work has some 'cleansing' effect. When we inspected the streets some days later the pavements look less messy, crowded and haunted by trashy bikes, although it has not entirely eradicated the problem. Interestingly, there was less general garbage as the municipalities sweeping machines could better traverse these streets.

Afterlife

As mentioned, the collected bikes' destiny is recycling or scrapping. The 'unlucky' ones are driven directly to the scrapyard on the outskirts of Copenhagen where: "they are 'brutally' smashed together with cars and other metal waste: brutally, as they are not examined for valuable and reusable parts (field notes, 29 May 2013) (as is the case with ship wrecks in Bangladesh, see above) (see figure 4). These bikes end their lives as mixed scrap that is shipped abroad and remelted in countries such as Turkey, Vietnam, and India, the head of the scrapyard tells us (field notes, 29 May 2013). The payment that the municipality receives in return—around £12000—is symbolic and covers only of 4.5% of the expenses connected with the clearance (e-mail correspondence with municipality officer, 15 March 2013). This is despite the fact that 97.5% of the collected bikes are turned to scrap metal and only 2.5% are reused (our calculations based upon the municipality's statistics).

Figure 4. Scrapyard.

The 'to-be' recycled bikes have to wait another four weeks before they can be sold at the police auction. This is in case a rightful owner calls for his or her bike and to check whether any has been reported stolen. If a bike has been stolen, it is reunited with its owner or handed over to the insurance company if the insurance payout has already been made. The unstolen and unclaimed bikes are then sent to popular police auctions open to members of the public hunting for a good bargain. Second-hand cultures are often driven by thrift, by more rather than less consumption (according to Gregson et al, 2013). At the auction we attended, a few

hundred bikes were sold at an average price of £88 (only a few did not get any offers) bought by private buyers for their use-value and by bike shop owners for their exchange-value. After a bit of repair work, the bikes will be resold and thereby reinjected into another cycle of exchange and use on the very streets from which they had previously been removed.

Conclusion

The Copenhagen bicycle system is applauded worldwide for high-quality elevated cycling lanes. This pro-cycling city has more kilometers of cycling lanes (relative to its population) than any other big city (Buehler and Pucher, 2012, pages 292–294; Larsen, 2014a). Moreover, they are well maintained, and not plagued by potholes and vanishing painted lines [as is common in New York and London (see Larsen, 2014a)]. Yet as Graham and Thrift (2007) argue, even well-functioning systems are prone to errors and neglect. In this paper we have argued that the bicycle system in Copenhagen, because of its many neglected, half-dead, abandoned, and wasted bikes, is no exception. We argue that, generally speaking, many bikes in Copenhagen are treated as inferior and disposable objects that 'live rough' on the streets. Consumer objects are always unstable and unbecoming. Yet this process is speeded up in Copenhagen with regards to bicycles. This is caused by a combination of inadequate urban design, lack of maintenance and repair, weather conditions, and cheap bikes with poor materials. A vicious combination of poor parking design and theft discourages investment in quality bikes and becoming attached to them. This means *less* cycling. Neglected bikes do not afford a smooth, fast, or long ride. This in part explains why longer commuter journeys to and from Copenhagen are rare (Bradtberg and Larsen, 2014). *Cycling*, more usually applauded as a sustainable form of transport, can also cause CO_2 emissions, clutter in the streets, and waste. This, we have argued, is not because bikes are victims of the whims of fashion and planned obsolescence (as with many other consumer objects) but rather because many people ride cheap bikes that are insufficiently maintained and repaired, and often replaced with a new cheap model within a few years.

We have paid particular attention to the municipality's attempted ordering of the perceived disorder and waste around bikes. This maintenance work is slow, challenging, and expensive. Order is never maintained for long. Stolen and half-dead bikes quickly haunt the stands again—these are bikes that are going nowhere and are woefully heading towards the garbage tip. As Edensor says more generally: "Systems of disposal are rarely perfect and matter is

often more difficult to eradicate than is imagined" (2005, page 836). Very few of the collected bikes or 'bike parts' are recycled. There is more concern with getting rid of dead bikes than with 'giving first aid' and saving functioning 'organs'. This is in part because the law prevents people from scavenging unclaimed bikes and the municipality from giving away the collected bikes.

We end by proposing that a truly cycling-supportive and sustainable city should not only be known for its cycling-friendly environment (cycling lanes, speed reduction for cars, few bicycle casualties, and so on) but also by adequate parking, little bike theft, good-quality bikes, second-hand and vintage bike cultures, DIY repair and maintenance skills, and affectionate bike owners who treat their own and each others' bikes with respect. In this light, Copenhagen is not yet a truly great cycling city.

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