Matter contained/matter unbound: the situated practices of (ship) breaking

Nicky Gregson: Department of Geography, University of Sheffield, Sheffield S10 2TN.

"Without crews, ships are […] merely inert and useless artefacts" (ILO 2004: 191)

Paper prepared for *The Waste of the World* Workshop 08.1 – Sheffield, January 25th 2008

I hesitate to call what I am about to say a paper; rather, these words (and images) are more fragments that may become … well, I'm not sure what they will become. Perhaps a paper, perhaps papers – maybe chapters, or there again – maybe they will melt into air. What I am rather clearer about is two related points. First, one of the primary objectives of *The Waste of the World* programme is to think economies through materiality/ties. For me, this means that we have to work in ways that take practice seriously. I could at this juncture digress to consider why I find practice theory a particularly apposite development in the social sciences.[1] However, such would be diversionary. Instead, I want to highlight that – unlike some recent accounts (Warde, 2005) – I see objects as integral to practice, not just a means to invest in a practice (in a particular way) but as constitutive of the performance of a practice. So, for me practice entails the necessary conjoining of the human and the non-human. In that practice alerts us to the importance of on-going, routine, repetitive forms of activity it has implications for how we think about objects. Thus, recent work on practice – including some of my own – has highlighted the importance of objects-in-use, or – to use John Law's phrase, 'things-in-process' - as opposed to objects-in-themselves (Gregson, 2007). Indeed, as Martin Hand and Elizabeth Shove (2007) have argued using the freezer and freezing as their exemplar case, objects work to stabilise, orchestrate and condense activities, in so doing ensuring the reproduction of particular practices. Whilst these arguments about the connections between objects-in-use and stabilising practice/s are important to make, it is vital that we recognise that this is a position that – notwithstanding its commitment to the way in which practice is continually remade - slips quite easily into an argument that elevates the stability of practice over practices' transience. Thus certain objects with certain capacities (note not necessarily the same object) work both to materialise and to orchestrate particular sets of activities – understood here as repeated patterns (of use). In turn, these patterns constitute the nodes for specific practices. What gets overlooked here is that use-in in turn affects objects, and that this too has implications for practice – in terms of how well certain practices might continue to be done/performed – as well as for particular objects themselves, and their trajectories (Gregson et al 2007). For me this raises important questions – specifically, what happens to practice when objects start unravelling or when we unravel objects? Or, to put this another way: how might practice theory attend to the transience of objects? Much of what follows is an attempt to engage empirically with precisely this question.

A second point concerns the objects-in-use that constitute the core to this project, ships. One of the most intriguing aspects of the 'practice turn' in the social sciences – if I might label it thus – is that it has condensed empirically around a relatively narrow range of fields, notably consumption research and (for want of a better phrase) 'science studies' (Warde, 2005; Pickering, 1995). In part this is purely an effect of interests. But, given the ways in which consumption has been related to production, this has had serious ramifications, not least in that practice has been elucidated in respect to households and the home, retail sites and spaces – and not to other sites and spaces, where we might note, objects-in-use are just as likely to be found. Factories,

[1] A useful overview of this highly fragmentary field is provided by Schatzki (2001), combined with the various essays contained in the same volume. Warde (2005) provides a review, drawing on the work of Schatzki and Reckwitz, before applying their concerns to consumption.

plants, organisational headquarters, call centres … Andrew Pickering makes a related point, noting:

> 'The early political economists, from Adam Smith to Karl Marx via Charles Babbage were intensely and explicitly interested in the coupling of people and machines in the factory […] Somehow, however, that line of posthumanist thought has been repeatedly subject to humanist and antihumanist purification […] As Peter Miller and Nikolas Rose put it: 'The plant [then became] understood as pervaded by an attitudinal and communicative atmosphere, a socio-psychological overlay to the actual organisation of the productive process itself […] the humanist overlay was claimed by the social scientists, while the productive process itself was retained by the engineers' (2001: 170).[2]

In what follows therefore, I want to extend thinking through practice into a new field, to work with a very different kind of object to those encountered in the home, and to move simultaneously to thinking about this object's transience and what this has to contribute to broader considerations relating to work on practice. That object is the ship, the focus for Project 1 of The Waste of the World programme. So before turning to practice, a few necessary words on this remarkable object.

Some observations on contemporary ships

In his early ANT/Foucauldian study of Portuguese imperialism, John Law (1986) conceptualises the ship-in-use as a classic instance of the immutable mobile. The contemporary commercial ship is, on first inspection, no exception. Whilst the bulk carrier, oil tanker or container ship is far removed from the Portuguese carrera, its capacity to transport commodities predictably, routinely, 24/7 is no less fundamental to the reproduction of contemporary capitalism (and globalisation) than the carrera was to late C15th colonialism[3]. Except that, such arguments remain at the level of category generalisations. So, whilst ships - as the capacity to navigate the high seas, to 'find a way' reliably and repeatedly from port to port, to carry cargos - have endured, and whilst ships (capacity) can (by virtue of historical reach) be argued to be an exemplar case of the immutable mobile, I think this account is missing something. Most obviously, we have little means to move here from the carrera to the oil tanker; that is, from a sailing vessel (with a relatively large crew) navigated by an assemblage of charts, stars and astrolabe (Pérez-Mallaína, 1998), to a state of the art tanker with a skeleton crew, navigating by satellite communication technologies, in continual contact with 'land', and (by virtue of the transformations in port handling) in a state of

[2] It is perhaps interesting to reflect that engagement with practice in economies research has largely been confined to the burgeoning communities of practice literature – for a review of the field see Amin and Roberts (2008). The emphasis here, however, remains largely on communities, their relation to knowledge and learning, and their spatialities, and has rather less to say about practice, notwithstanding acknowledgement of the importance of know how and tacit knowledge.

[3] For an insight into the workings of the contemporary maritime industry and its relation to globalisation see: ILO (2004), Sampson and Bloor (2007). Allied work conducted under the auspices of the Seafarers' International Research Centre at Cardiff University includes: Sampson (2003); Sampson and Wu (2003); Wu and Morris (2006); Alderton and Winchester (2002); Obando-Rojas et al (2004); Wu (2004). See also: Lane (1997); McConville (1997). It is worth noting that this literature focuses particularly on labour, taking its cues from debates on transnationalism and global governance. A rather different take on the shipping industry and globalisation is contained in Allan Sekula's *Fish Story* (2003).

virtually constant motion. Rather less obviously, perhaps, we certainly don't get to find out what happened to the carrera in Law's account. It was designed, it was made, it was pivotal, it constituted extensive networks of power (in conjunction with other agents) – and that is the interesting bit. The 'what-next' (as with so much early 'ANT') is not there, indeed was never there. Others have, of course, made the same general point in relation to ANT, STS and innovation – and this is why I think it is vital to make the same arguments with respect to the turn to practice. In short, I think we risk making a similar mistake. So, let me persist a bit with ships, not with ships-as-capacity but with ships as objects-in-use, in themselves.

On closer inspection, commercial ships singular – particular, for the most part bespoke fabrications that bear unique identifiers, the vast majority of them made in the ship yards of South-east Asia – are not quite as immutable as the ship-as-capacity. Shipping industry insiders frequently quote the maximum working 'life' of any one commercial ship as somewhere in the region of 25 years.[4] After then – perhaps well before – the costs of keeping the vessel seaworthy are such that they exceed what can be earned through the vessel's capacity to carry goods (or people) between places. The life of a vessel then is a matter of classic supply/demand economics, and specifically of the calculative frame of intersecting cost curves. Once crossed, or even anticipated as crossing in the imminent future, intervention occurs and the vessel is offered for sale, and if no buyers are forthcoming it will be ultimately offered-up 'for demo'.[5] At which point, it passes through a chain of brokers and agents whose transactions mask as they effect the exchange, journeying – if it is a large oil tanker – most likely to the coastal waters of the Bay of Bengal, and to Sitakunda Upazilla, Chittagong, Bangladesh. There it will be broken up.

Such are the broad contours of the economic life of a commercial ship. Whilst ships continue to sail and goods flow between Asia, Europe and the US, between South America, Europe, China and the US, and from Africa to Europe, or Australia to Asia and Europe, it is the dynamics of the shipping industry that choreograph these flows. Finely grained and (to outsiders) an opaque entity, differentiated by commodity markets (Baltic Dry, Baltic Capesize …) and ship types (VLCCs, Panamax, Capesize, Handymax, tankers, bulkers, container, reefer …), the shipping industry provides the context in which to situate individual ship journeys. Indeed, the options for what to do

[4] It is important to note here the connections with the ship survey and inspection regime. 25 years corresponds to the point of the Fifth Special Survey. Special surveys are extremely demanding inspections of a ship's hull and machinery. As ships age, inspection surveys become increasingly stringent, subjecting increasing areas to corrosion testing. Mikelis (2007) however, shows that this oft-quoted figure needs to be 'upped'. Whilst broadly accurate for the 1990s, when the average age of vessels at demolition was 26 – 27 years, in the 00s average age on scrapping continued on an upward trend. By the early 00s it had increased to > 30 years; by 2005 and 2006, to > 32 years i.e. to just before the Intermediate Survey after the Sixth Special Survey.

[5] The progression of any single ship to demo is both more protracted and more complex than this skeleton account. For a useful overview, see Stopford (1997). A faster moving enactment is displayed in *Fairplay News* and via http://www.fairplay.co.uk. The current boom in world trade means that new build orders are particularly buoyant, with relatively few ships being offered for demolition. This situation suggests that a boom in demolition will be imminent, once the market becomes saturated with these new vessels, In turn, a boom in demolition will be fuelled further by the impending phase-out of single hulled tankers (due 2010). It should be noted, however, that, rather than fuelling demolition, the latter has been accompanied by a significant increase in demand for conversion (L R Fairplay, 2008) – in itself indicative of the current financial incentives to keep older vessels sailing and of demand for bulk ore carriers, itself indicative of trends in the global steel industry.

for any one voyage with any one ship are carefully modelled by owners and charterers, with respect to the ship itself, the fleet of which it may be part, and broader freight economies (including trends). Further, as with those other workhorses of transportation, cars, trains and planes, the second-hand (sales and purchase) market in ships is highly developed – in itself an indication of the value of the original commodity form. An individual ship therefore can (and does) pass between operators, it may be re-flagged ('flagged-out'), be put on charter, traded on the spot, be converted, be 'laid-up', or move its theatre of operations, as owners and agents respond to the fluctuating conditions of the freight market/s, to the relations between 'new-build' and 'demo' markets, and to the predicted, future and actual capacities of individual ships to earn hard cash from particular voyages. As Stopford says, the closest analogy is to a game of poker: indeed, shipping is 'the world's biggest poker game, when the ships are the chips' (1997: 38).[6] Mobile this object-in-use certainly is. But, positioned in a nexus of markets and regulatory frames, a commercial ship's continued mobility (its use) is profoundly a matter of exchange values and regulation; its capacity to endure and to return is fundamentally about the profitability of business, and particularly trade flows, in global capitalism, the profitability of its (current) configuration, and its capacity to continue to comply with the regulatory regime of a particular flag state.[7]

Whilst commercial ships constitute the bulk of the world fleet, it is important to flag at this juncture a different category – naval vessels. In that these are primary instruments of control and military support – think, for example, of the role of various US aircraft carriers in the Gulf during both Iraq wars – these vessels are perhaps the closest contemporary parallels to the Portuguese carrera or, for that matter, to the Elizabethan galleon. As individual ships however, they too have lives. And, whilst they may be re-fitted (the ship equivalent of being repaired), as with all objects-in-use, use eventually begins to catch up, be this in terms of relativities (of cost, speed, flexibility) to other, newer, vessels or in terms of material decay. For most naval ships what this means is that (when this happens) a ship will be 'mothballed' i.e. put into long term storage, pending break-up, or an emergency (read war), in which case it would be called on to act as an auxiliary vessel – troop carrier, hospital ship, equipment carrier etc. As we have seen, however, in the absence of certain forms of warfare and of adequate naval breaking facilities, long term storage can be very long term indeed. An example. In the UK, HMS Fearless (shortly to depart for Van Heyghen Recycling in Belgium) is just the most recent in a long line of cases – it had been 'hanging around' in Portsmouth for over 5 years before its sale. A couple of

[6] As an example, Stopford cites a Panamax bulk carrier of 65000 dwt. This would have cost $6m to build in 1986, but by 1989 $22m. In 1986, taking operating costs into account, it would have earned $1m, in 1989 $3.5m, in 1992 $1.5m, and in 1995 $2.5m, however it would still have been worth $22m. Such volatility means that the timing of buying, selling and chartering is critical. It also leads to cycles of boom and bust, and underpins the narratives of risk that characterise the shipping business.

[7] The variability between flag states in terms of compliance with the regulatory regime is well known (see ILO 2004). Briefly, compliance with the 53 IMO conventions is higher in the older, often embedded registries (e.g. Norway, the UK, Germany, Denmark) and less so for the newer open registries (FoCs), of whom the Bahamas, Cyprus, Liberia, Malta and Panama are the most well known. A third category of flag states are barely compliant e.g. Bolivia. Ships flying certain flags, however, are – by virtue of the known lack of flag state compliance – more likely to be subjected to port inspection and delay/detention. It is also notable that in respect of attempts to instigate an International Convention for the Safe and Environmentally Sound Recycling of Ships, the IMO already anticipates the emergence of compliant and non-compliant flag states (Mikelis, 2007).

years ago, the Sir Geraint – a vessel that first made the front pages of the UK press as a Falklands landing craft - made another set of controversial headlines, as it was sold through the British Navy's brokers to end up on Gaddani beach in Pakistan. That it became, in the process, a commercial vessel is incidentally just one indication of the ease in which a ship's classification may mutate through sale and of how far actual form may deviate from paper descriptor. Anything further from a commercial vessel than the Sir Geraint is hard to imagine, but such mutabilities (and the impossibility of checking paper's accordance with material form) are one of the primary ways by which objects-in-use somewhere translate to become objects transformed elsewhere. Lest it be thought that the UK Navy is in any way exceptional here, we will be coming back to discarded ex-naval vessels a little later on, but this time to the discards of the US Navy …

But to return to my primary concern here.

Practices of ship breaking

Let me say first off at this point: ship breaking, wherever it occurs, and however it occurs, is a messy, potentially dangerous and noisy business. It cannot be otherwise. Ships are big objects; further they are heterogeneous materials, and these heterogeneities (by virtue of what a ship actually is) include a lot of 'nasties' including oils, persistent organic pollutants (e.g. PCBs – polychlorinated biphenyls; PVC – polyvinyl chloride; PAHs – polycyclic aromatic hydrocarbons; organotins, including tri butyltin, TBT), asbestos; heavy metals – including mercury, lead, zinc, arsenic and chromium; as well as tons and tons of steel plate. It is precisely for these reasons that I prefer to refer to these activities as ship breaking, rather than use the term ship recycling. Increasingly prevalent, particularly in policy circles, the term ship recycling conveys more of a sense of recycling ships per se than the actualities of ships torn apart to recover materials. I will come back to this point later.

To begin to open the practices up, I want to show two sets of footage. The first is a set of photographs kindly given to us by Scheepssloperij in the Netherlands. The second is a short film made by CBS of breaking operations in Chittagong, Bangladesh.

Pictures + VT footage here

The two sets of footage constitute what are represented in regulatory documentation as the two modes of breaking-up ships in the world today. One occurs in a 'dry dock' facility (or pier), the other on open beaches. The first is to be found in the OECD countries – but not very many of these [the US, Belgium, the Netherlands, Italy, and to a very small degree, Greece and, albeit very tentatively, the UK]. It is capital intensive, characterised by the use of a variety of heavy-duty lifting, cold-cutting and shredding equipment and the possession of a large number of waste management licences. The second is labour intensive in the extreme; hot-cutting technologies prevail, and these activities, not surprisingly, have attracted considerable attention on the part of environmental NGOs (Greenpeace, 2004). Such activities characterise ship breaking in India, Bangladesh, Pakistan and Turkey particularly. For an indication of the relative size of these markets see Mikelis (2007)

Much has been written in the 'grey' literatures and by investigative journalists (the vast majority of them western commentators) about the latter situation (Buerk, 2006).

The narrative lines here are predictable, frequently crafted in the polar hues of black and white. They highlight that ship breaking is dirty, dangerous, Dante-esque. To work here is to descend to an acrid, oily and metallic-filled beach – a hell where death on-the-job is an everyday occurrence, where injury is commonplace and where wages are pitifully low (YPSA, 2005). Capital in such accounts is exploitative, unregulated, uncaring – of marine environments and of human life in equal measure.[8] Moreover, in that these former ships – now lying beached, abandoned as carcasses-after-the-slaughter - were once pristine, many of them conveyers of cargos that brought oil (liquid gold) to fuel the economies of the West, enables narratives of a renewed colonialism, grounded in dumping and pollution rather than resource extraction. Rather more nuanced accounts (Hossain and Islam, 2006; Cairns, 2007) recognise that such apocalyptic tales have shades of grey, that ship breaking in such contexts performs an economically vital role, that it may have been innovative, resourceful and creative in its coming into being (certainly the case with the development of the Bangladeshi industry), that working in this industry may indeed be better than an alternative of rural poverty. In contrast, rather less attention has been focused on the first mode of breaking – perhaps because this is a less obvious journalistic 'story'?[9]

In what follows therefore, and because Farid and his team cannot be with us today, I want to focus on the practices which we are working on here in Sheffield. Let us take the 'dry dock' practice, and go back to the images. What is going on here? I want to argue that there are two sets of points that merit our attention:

1: There are sets of conditions that must be satisfied for the activity of ship breaking to occur anywhere in the world. These can be summarised as the possession of the full set of waste management licenses appropriate to the particular nation state within which the facility is located. We could focus on these paper regimes - and of course it is the differences between these regulatory regimes that propel ship breaking activities from the west toward South Asia – but the important point for us here is that the dry dock acts as the orchestrating node for all this paper. Indeed, without the appropriate concentrations of paper, the capacity of the dock to perform a breaking is rendered null and void, witness the last four years in Hartlepool, or indeed the Dutch Eco Dock facility (an entity that exists virtually but which has never performed a breaking). More than this, in these locations compliance with paper is not just a matter of possession but of routine inspection, or surveillance – Mr A: "the helicopter comes over every day, but we know when they are coming". So, the potential for enforced cessation of activities is always there. Indeed, for the activity of breaking to recur in any one dry dock requires that each breaking be practiced appropriately, within the terms of law – de facto if not de jure. Putting to one side difficult questions to do with covert attempts at avoidance and/or limited degrees of compliance on the part of ship

[8] On the degree of marine pollution in the Bay of Bengal consequent upon ship breaking activities see: Islam and Hossain (1986) for Bangladesh, and for Alang, see: Srinivasa Reddy et al (2003, 2004, 2005).

[9] As an aside, it is worth highlighting that the Bangladeshi ship breaking industry began by accident, in 1960, when a Greek cargo ship (MD Alpine) ran aground during a cyclone above the HWM, resisting all attempts to re-float it. According to Buerk (2006), local businessmen eventually saw the opportunity in all the steel sitting on the beach – although this was not until 1964, and it took years to scrap the vessel (Hossain & Islam, 2006). However, it took the war with the then West Pakistan (1971), and the allied development of steel re-rolling mills (Buerk, 2006: 91 – 4), to rekindle the business. The ship breaking industry in Bangladesh provides 90% of the materials for the country's steel industry and is an important source of foreign exchange.

breaking capital, together with strong arguments made by European interests regarding 'unfair competition', such paper regimes, together with their accompanying surveillance devices, continually threaten the activities they enable. What do I mean by this? That the process of ship breaking – as befits any activity that is about breaking things up – is one in which materials (in this case many of them toxic) are being released from the safety that is the prison-hold of their material configuration or containment, in this case the object form of a particular ship. Not to mince words, the potential in such acts for paper to be breached by material is a constant presence: once released from the order that is the order of the object, disorder can all too easily follow, mess prevails and mess has a habit of behaving in unruly, often unpredictable, ways. Or, stuff released can become matter unbound contaminating all that comes in contact – people, land, the wider dock, the sea, machinery, clothing, earth, other living organisms - incurring, at best, hefty fines, at worst, the shut down or cessation of activities. So, for the activity of breaking to even occur in nation states with strong environmental protection and strong labour protection requires that technologies of breaking are technologies of material containment. Let us have a closer look at these technologies of breaking.

2: In broad terms we can label the practices of breaking as involving technologies of intervention. However, the interventions of breaking are the antithesis of fabrication. Rather than bringing forms into being through the conjunction of materials, skills and ideas, breaking is about taking things apart, through the same conjunction of materials, skills and ideas. It is then a reducing activity; in breaking things both disappear and condense down to their component parts and constituent materials. Reduction (of this type) is not the sort of activity that social scientists have traditionally paid much attention to. I think, in part, that this is because such practices are all too much about materials, and dirty materials at that – in both the literal and figurative sense. But I think too that such neglect is also indicative of the practices themselves. Such activities highlight the destructive capacities of humankind, when what we (as social scientists, and, for that matter, people) prefer to focus on is the creativity of homo faber.[10] The stuff that we get rid of, or destroy, well it's the stuff that society no longer wants or cares about, an activity that occurs on the margins, in places people don't go to unless they have to – so why bother with it? Needless to say, I want to argue somewhat differently and, to follow-up on a previous argument made in relation to divestment and ridding, I would maintain that breaking is no less an economic, social or cultural an activity than assembly or manufacture. Breaking, then, is no less a conjunction of materials, ideas and skills as design and innovation, particularly when – as now – it is being enacted in ways that are increasingly about materials recovery for re-use and for re-manufacturing. Indeed, I want to argue that this mode of breaking – in which recovery and re-use figure as increasingly important counterpoints to the hazardous leftovers, even to legitimate the realisation of the hazardous leftovers – signals the emergence of a new waste regime, of the type discussed by Gille (2007) in relation to the post-Soviet transition states. In this regime, in breaking, materials are simultaneously liberated from the bounds of the object, but they have to be liberated in ways that do not involve cross-contamination. This kind of activity is manifestly not the same as that implied by the terms destruction or demolition – the terms traditionally used for such activities, but perhaps

[10] For an indication of the pride in work in the metal trades within ship fabrication and repair, see Blum's (2000) account of post war changes in the San Francisco Bay area ship yards.

vestiges of a previous (less careful, more wasteful, more contaminating) waste regime? Characterised by degrees of care, by acts of materials differentiation, and by sequentially planned, 'flowing' activities, I'm more inclined to use the term 'dis-assembly' here, particularly since this maintains a connection to the manufacturing activities with which such activities are increasingly linked, but this is not set in stone. Dis-assembly is therefore something of an art form, involving acts of separation and purification that are continually about the identification (or not) of particular *material* presences, their choreographing, handling, collection and displacement, and their subsequent certified absence from what remains (in itself an interesting twist on the temporality and spatialities of the 'leftovers'). The following images, from Van Heyghen Recycling highlight how the mutilating imagery we saw in relation to Scheessloperij connects to acts of separation and purification.

And materials flow diagrams from Esco Marine (Brownsville, Texas) give some idea of the spatiality of these flows and their choreographing within the bounded space of the yard.

.

Disassembly then is a classificatory act performed in materials. Within the temporalities of an individual act of breaking, initially such classificatory acts are enacted around the hazardous/non-hazardous boundary (a boundary in itself constituted through scientific knowledge of toxicities). What threatens human and non-human life, that which is toxic (PCBs, asbestos, oily wastes) is of prior temporal importance here: before breaking can commence a ship has to be certified free of toxic substances, these safely removed and collected-up, usually to be held in discrete, spatially separate storage facilities prior to transit to a permitted elsewhere (a landfill, hazardous waste dump …). All this must occur such that the remainder can be safely dis-assembled, differentiated and displaced for recovery. In part these subsequent evaluations are machine-made – ferrous is separated from non-ferrous by virtue of the capacities of large magnets. Elsewhere, it is still the eye that makes the judgement – as with copper. In that it is about breaking-up things that have been designed to endure, the dis-assembly of ships however involves the exertion of considerable force. The 35000 lwt of a VLCC (300000dwt) is no small matter to set about moving and

breaking.[11] So, these technologies of intervention have to be strong and they have to be savage. They must both lift, haul and move, and cut, chopping and tearing in ways that simultaneously break-up but transform for future potential. They have to reduce these off-cuts further then, breaking things up and simultaneously breaking them down into manageable bits. How do they do this? By means of the teeth of the 'alligator' and the multiple, rotating, mutilating blades of the shredder.

Meet the alligator and the shredder

Mutilating materials: the shear and the shredder

The imaginary that underpins the design that is the alligator is readily apparent. Here is a Nature Red in Tooth (if not claw), which tears at the 'flesh' or the carcass in this dry dock in the manner of predators the world over. But this is also a hybrid predator, attached through prosthetic-like technologies to an identifiable piece of construction-style mobile plant technology, to a cab, a joystick and to a human operator (invariably male, often – or so it seems from the evidence we have so far – Eastern European). We need to note too how remote, detached and therefore protected, this human operative actually is from the materials being attacked – this is a carcass that will only ever be worked with through mediating technologies and control sticks. Such 'cold' mutilation techniques are a world away from the 'hot cutting' that characterises this work elsewhere in the world, where handling metal (and the use of the blow torch) is mediated only by gloves and a welding shield, not complex prosthetic technologies. What such techniques signal, of course, is the presence of a plethora of health & safety legislation which works to shield (and value) the figure of the working body. Indeed, it is the relative absence of such bodies that is the hallmark of practices of ship breaking in the EU (when it actually occurs) – in itself a note of caution when claims are made re the job creation that ship breaking brings. The same degrees of shielding, protection and the ceding of agency to the machine are encountered when we examine the other key technology in dry-dock breaking, shredding.

[11] Mikelis (2007) provides estimates of the lwt of various categories of ships, the vast majority of which comprises steel plate. Thus, a typical VLCC would comprise 35000lwt, a typical Panamax tanker 10 – 3000lwt, a typical Capesize bulker 20000lwt, and a typical Handysize bulk tanker 7000lwt.

To my knowledge, the literature on the shredder is confined to a few pages of John Scanlan's *On Garbage*. Here we meet a very tame shredder indeed, the type of shredder we have in our homes to mince-up financial receipts and personal identifiers, or the type of shredder that lurks in the background of most office settings – imagine RAE sub panels as we speak. Scanlan's shredders are very much machines located in representational space. Their work is made sense of through security considerations and the perpetuation of power. Shredding here is, at one level, about attempting to preserve identities (from being appropriated by others) and, at another, about confidentiality, or more accurately, an act of erasing the trace of particular decisions taken by some about others. Indeed, to go further than Scanlan, I would hazard that the shredder is perhaps the device that allows us to live in a world of identity theft and Freedom of Information – though perhaps our love for it hasn't quite caught up with the world of automated back up and hard disk data storage, not to mention CDs lost in

the post? But, I would argue, shredders are more than this. They work precisely because of what they do with and too material, in this case paper. It is precisely because they splice paper into multiple shredded strips that they protect; by annihilating the text through mutilating paper, shredders nullify the very marks that are the basis of identification. Shredders then conjoin both the material and the representational, and that we love them is an effect of their acts of mutilation. But, these familiar shredders are very tame ones when compared with their industrial counterparts. Some of these industrial counterparts are very similar in what they do to the humble paper shredder. Others, however, are hybrid monsters.

Let's take a look at these technologies. From the outside and to the uninitiated it's just a black box, stuff in – stuff out. But, of course, rather more is going on inside the box. In technical terms, inside containments such as this hydraulically powered guillotine shears exert thousands of tonnes of pressure to further reduce pre-cut heavy steel into neat chunks of 'furnace feed'; rotating magnetic drums extract iron and steel from other metals and materials; eddy currents, forced air and liquid sink flotation systems work to separate aluminium and copper. We can see this in action through this stylised animation.

Animation here

When I look at this animation all sorts of biological analogies come to mind; it is like looking at one of those movies of what happens with human digestion. But instead of eating 'food', this monster body devours cars, fridges, steel plate … Objects, or bits torn off of them, are placed within, and subjected to a plethora of techniques – magnetic attraction/repulsion, filtration, blowing – which work to identify and separate out materials, passing particular identifications through particular conduits. This multi-tasking, multi-conduit machine is a world away from the humble paper shredder. Not only does it deal with materials in the plural (as opposed to the singular) but it has a reductive (and compressive) capacity, returning certain configurations to a prior, constituent state, less object more metal.

Rather than merely mutilating, this shredder conjoins blades with other technologies. It mutilates-to-separate, with each act of separation infused with the alchemic fantasy. In terms of practice, what this shredder does is to conjoin scientific knowledge about materials with engineering skills of plant design to stabilise, condense and contain multiple acts of materials separation. As such it could be said to condense both transience and the act of transformation, highlighting the finite temporalities of the object world and the endless potential of constituent matter. In short, the practices inscribed in and materialised in the industrial shredder turn product worlds upside down, insisting that what actually matters is the potential to effect the transformation, not the finite, finished object.

It is for what it does, then, that I think we need to appreciate the industrial shredder a little more. But I want to close this section on the shredder with a few more cautious words. Undeniably, such shredders are 'big beasts' rather than fluid technologies on the Zimbabwe-an bush pump model (de Laet and Mol, 2000). Capital intensive, they require large amounts of money to buy, to design and build, to keep powered, and to keep fed – although we might note that, unlike certain other 'recycling technologies' (think ThORP), keeping such things permanently fed to counter the problems of shut-down is not a requirement here. A corollary of all this is that these shredders are not run-of-the-mill everyday pieces of equipment. Indeed, many are bespoke orders, manufactured by high tech Austrian, Danish, German and American companies, taking over a year to produce (much like the ships they mutilate). So, in terms of where and how such shredders might fit spatially within economies, we can suggest that they are (and will become) concentrated, located principally in those parts of the world where metals recovery is a critical part of economic activity. China, Korea and the major steel producing areas of the rest of the world spring to mind, but so too do those parts of the world with already high levels of consumption. In which case, one of the ultimate ironies of the development of the shredder may be that the west – through the medium of these shredding technologies - comes both to supply the technology and to generate the new (secondary) materials for a global economy in which recovered materials figures increasingly prominently.

Shut-down

By way of 'wrap-up', and to throw-out some thoughts, I want to flag four points, three of them relating to practice, and a fourth to some rather more emergent ideas about what ship breaking activities have to contribute to the development of understandings of current waste regimes.

1: It seems to me fairly clear cut that it is appropriate to talk about the activities of ship breaking as practices, and further that these are important practices to set alongside the instances that currently feature in the literature e.g. discussions of shopping, cooking, freezing, tidying-up, collecting, and driving/motoring (!). Wherever it occurs in the world, ship breaking is an integrated co-ordinated set of actions, involving objects, people, ideas, skills and know-how, and emotions (I note here, that we need to know much more about these); it is orchestrated by particular rules and regulatory codes; and these actions are actualised, that is, performed – be these idealised virtual performances (as with Eco Dock), anticipated (Hartlepool) or enacted (Belgium, Netherlands, the US, Bangladesh …). Closer inspection suggests that we should think about the general practice as empirically nuanced. Indeed, self-evidently there are two substantive forms of the practice – one spatially contained (to a relative degree) and the other unbounded. Extremely schematically, the two forms are to be found in different parts of the world – and that they are thus is clearly an effect of institutionalised differences surrounding and constituting the capital-labour-state-environment nexus. However, and a matter for further empirical work, is a fine-tuning of just how different the two practices actually are.

2: Rather less straightforwardly, ship breaking as a practice relates to a rather larger activity – something I have called here dis-assembly. The broader theoretical issue here is to do with how practices connect, and at what level they connect. So, I'm asking myself the question 'How does dis-assembly relate to practice?' Is it a practice, or a meta-practice? Or, and this is a line that I find slightly more convincing at the moment, is it a related set of practices that share certain actions without necessarily being integrated? If we think about the activities and performances outlined here, there are resonances with other actions and performances – notably slaughter houses and butchery, but also the activities that can be found at a range of waste collection and handling sites (MWRFs, HWRCs, incinerators), or those that characterise the scrap yard. Taking this forward, there are implications for how such arguments might relate to accounts that apply practice theory to consumption. Whilst these accounts certainly do take use values seriously, many have ducked the issue with what happens when use values are expended (materially and/or symbolically), confining attention to moments of consumption in practice. To go in this direction requires that attention be paid to divestment and 'disposal', and not just appropriation. I have been trying to attend to this for a while now! However, here we are engaging with practices that are actually about the material annihilation of particular use values. This practice is about the end of life of particular ships; it is about their social, economic, cultural and physical death. The death however is – I sense – a form of sacrifice; one that sacrifices form to enable the release and return of materials to the productive sphere whilst simultaneously leaving behind a remainder, as toxic leftovers. It is this cyclical (not linear) relationship (between consumption and production), and its enactment through the related processes of sacrifice and wasting, that need to be fore-grounded I think, particularly if industrial activities that are about recovery-for-re-manufacturing

are to be furthered. And we might note that such is far more easily seen and accepted in Bangladesh say than it is in parts of Hartlepool, where the seamless identification of 'ghost ships' with 'waste', toxins and pollutants continues to form the prevailing narrative, in turn obscuring that the materiality of these 'waste objects' is not confined to toxins, however important the latter are. By contrast, whilst wastes are certainly not neglected in the prevailing Bangladeshi narratives, it is the value that lies within that acts to legitimate the acts of wasting.

3: On routine: routine is central to accounts of practice, and also one of its primary bug bears, for the question routine raises is 'How might new practices emerge?' My sense is that this project is particularly illuminating in this respect - or that it will become so. On the one hand, what we have here is a practice (the first of our substantive practices) that, as an enacted performance, is not routinised, which to my mind makes it particularly interesting. Rather, as a practice it stutters along in fits and starts at best with considerable gaps between specific breakings (Belgium, the Netherlands, Italy, the US). In other parts of the EU (the UK), the practice is in the throes of attempting to be instantiated. So, we can say that attempts to forge the practice are being made – but they keep getting thwarted. How and why breakings are irregular occurrences, and how and why efforts to develop the industry keep getting thwarted, offer particular clues as to how new practices emerge (or not) – they are the negative that shows the positive. In Belgium and the Netherlands, the problems are about matters of economics and regulation, not popular protest – bottom line, when in direct competition with South Asian capital European activity is uncompetitive without a heavy degree of subsidisation. So, more broadly we can reaffirm that the establishment of new economic practices is heavily dependent on capital investment, capital accumulation and innovation, but that it requires a regulatory frame in which to succeed. All of which is pretty self-evident and well-established. In the UK, however, the thwarting has been a very messy business indeed – and is now the object of legal proceedings. On the other hand, what is going on at an international level in relation to the second substantive form of ship breaking practices can be read as an attempt to stop a practice; not an illegal practice but one which has been very successful economically, and which is legitimated institutionally in the nation states where it is currently enacted, even if one can question its consequences for people and the environment. Needless to say, to stop such a practice is a very hard thing to do (similar in the challenges it faces to the negotiations over carbon emissions and climate change) – requiring not just the cessation of activities, but the unravelling of all those acts, understandings, rules, hopes and dreams, that are realised through the practice. It is to these attempts at international regulation that we turn in the second of our working discussion papers.

4: On waste regimes: in her *From the Cult of Waste to the Trash Heap of History* Zsuzsa Gille develops the concept of a waste regime to think through the state socialist economy of Hungary through the post war period, until 2004. The concept has three components: the economic, political and material dynamics of waste's production, its conceptualisation and its politicisation. I think this concept has considerable potential for thinking in relation to our programme generally, and – on the basis of what I have said so far today – want to sketch out a few tentative, highly provisional, points suggested by the ship breaking project.

Firstly, when we look at the activity as it occurs in Bangladesh: this is clearly a waste regime where saving and collecting for re-use figure centrally, not just in relation to metals but in relation to absolutely everything else as well – but it does so in parallel with widespread pollution of marine environments, and by contaminating (and disregarding) the bodies who perform this brutal work. In part, this is about a particular form of capitalist development, to be found in many countries outside the OECD area, but it is also about the importance of steel to the development of the Bangladeshi economy, and to the broader project of the development of modernity. In Bangladesh, the ship breaking industry provides the basis for construction, for urbanisation. Extremely tentatively – this is a waste regime that would seem to narrate and materialise a modern Bangladesh, and to do so in a way that is about the independence of Bangladeshi capital from Indian capital (where we should note the importance of Mittal and Tata as two critical forces). It's a waste regime that narrates a particular South Asian political identity.

In the EU, things look to be very different. Ship breaking here is represented through the narrative and allied practices of scientific and technical 'clean-up' that we see in other industries, notably nuclear decommissioning and incineration, and as a necessary development that works to clean-up the pollution and labour-abuse occurring elsewhere in the world (South Asia). It is, then, represented as both a scientific and moral endeavour. As Gille (2007) shows, in relation to the expansion of incineration in Hungary post 1989, scientific and technical solutions to managing waste often translate as another means of realising vast profits at the same time as generating more wastes. So, let's have a look at this in relation to ship breaking. Certainly, when we look at the shredding and cutting technologies involved, they are the preserve of a few western, high-tech companies, for the most part Austrian, Danish and American. Moreover, the industry itself – once stripped of its protective 'recycling' mantra – can be seen to be generative of yet more hazardous wastes, in a similar manner to the generation of fly ash and emissions from incinerators. So, there are plenty of resonances there. However, unlike incineration ship breaking does not make money from handling and processing materials already declared to be hazardous wastes. Rather, these hazards are by-products of the process, problematic and costly to handle, and costly to 'dispose' of, requiring access to landfill and incineration technologies. Correspondingly, what else is being released through the process has to be of exceptionally high value. That something is ferrous scrap, coupled with non-ferrous metals. Less clean-up, more metals recovery, the development of the ship breaking industry in the OECD countries is, I would argue, indicative of the emergence of a metallic waste regime that connects to the rise of secondary manufacturing, or re-manufacturing in these economies. In such an economy, just what materials count as 'waste' matters intensely – witness recent disputes in the EU over the labelling of imported ferrous scrap as waste. As politicised, however, are questions of labour, for whilst some will continue to make in this economy, using secondary rather than primary materials, others will break – a form of work that, however much packaged through skill, however protected, however much narrated through 'clean-up', is dirty, dangerous and destructive. By way of ending then, I want to highlight that these 3 Ds pose an immense problem for a post industrial labour force, and by suggesting that the emergence of this metallic waste regime within the EU will entail quite a lot more by way of transnational labour than is perhaps anticipated in the cleansing rhetoric that shapes its emergence.

References

Alderton T, Winchester N (2002) Globalisation and de-regulation in the maritime industry *Marine Policy* 26: 35 – 43
Amin A, Roberts J (eds. 2008) *Community, Economic Creativity and Organisation* Oxford: Oxford University Press
Blum J (2000) "Degradation without deskilling: twenty five years in the San Francisco ship yards", in Burawoy M et al (ed) *Global Ethnography: forces, connections and imaginations in a postmodern world* Berkeley: University of California Press pp 106 – 36.
Buerk R (2006) *Breaking Ships: how supertankers and cargo ships are dismantled on the beaches of Bangladesh* New York: Chamberlain Bros.
Cairns G (2007) Postcard from Chittagong: wish you were here? *Critical Perspectives in International Business* 3: 266 - 79
De Laet M, Mol A (2000) The Zimbabwe Bush pump: mechanics of a fluid technology *Social Studies of Science* 30: 225 – 63
Greenpeace (2004) *Destination Unknown: European single hull oiltankers: no place to go*
Gille Z (2007) *From the Cult of Waste to the Trash Heap of History: the politics of waste in socialist and postsocialist Hungary* Indiana: Indiana University Press
Gregson N (2007) *Living with Things: ridding, accommodation, dwelling* Sean Kingston Publishing: Oxford
Gregson N, Metcalfe A, Crewe L (2007) Moving things along: the conduits and practices of household divestment, *Transactions Institute British Geographers* 32: 187-200
Hand M, Shove E (2007) Condensing practices: ways of living with a freezer *Journal of Consumer Culture* 7: 79 – 104
Hossain M, Islam M (2006) Ship breaking activities and its impact on the coastal zone of Chittagong, Bangladesh. Towards Sustainable Management. Young Power in Social Action (YPSA) Chittagong, Bangladesh.
ILO (2004) *The Global Seafarer: living and working conditions in a globalised industry* ILO: Geneva
Islam K L, Hossain H M (1986) Effect of ship scrapping activities on the soil and sea environment in the coastal area of Chittagong, Bangladesh *Marine Pollution Bulletin* 17: 462 – 63
L R Fairplay Research (2008) A new era for recycling *Fairplay* 3 January: 48 – 9.
Lane A D (1997) "Globalisation, de-regulation and crew competence in world shipping". In McConville J (ed) *Transport Regulation Matters* London: Pinter: 98 – 125
Law J (1986) "On the methods of long distance control: vessels, navigation and the Portuguese route to India", in Law J (ed) *Power, Action and Belief: a new sociology of knowledge?* Sociological Review Monograph 32, Henley: Routledge pp 234 – 63.
McConville J (1997) "The UK shipping industry and international deregulation". In McConville J (ed) *Transport Regulation Matters* London: Pinter: 78 – 97
Obando-Rojas B, Welsh I, Bloor M, Lane T, Badigannavar V, Maguire M (2004) The political economy of fraud in a globalised industry: the case of seafarers' certification *Sociological Review* : 295 – 313
Mikelis N (2007) A statistical overview of ship recycling. Paper prepared for International Symposium on Maritime Safety, Security and Environmental Protection, Athens, September 2007.

Pérez-Mallaína P (1998) *Spain's Men of the Sea: daily life on the Indies fleets in the Sixteenth Century* Baltimore: Johns Hopkins Press.
Pickering A (1995) *The Mangle of Practice: time, agency and science* Chicago: Chicago UP
Pickering A (2001) "Practice and posthumanism: social theory and a history of agency", in Schatzki T, Knorr Cetina K, von Savigny E (eds) *The Practice Turn in Contemporary Theory* London: Routledge pp 163 - 74
Sampson H (2003) Transnational drifters of hyper space dwellers: an exploration of the lives of Filipino seafarers aboard and ashore *Ethnic and Racial Studies* 26: 253 – 77
Sampson H, Bloor M (2007) When Jack gets out of the Box: the problems of regulating a global industry *Sociology* 41: 551 - 69
Scanlan J (2005) *On Garbage* London: Reaktion Books
Schatzki T (2001) "Introduction: practice theory", in Shatzki T, Knorr Cetina K and von Savgny E (eds) *The Practice Turn in Contemporary Theory* London: Routledge pp 1- 14
Sekula A (2003) *Fish Story* Richter Verlay
Srinivasa Reddy M, Basha A, Joshi H, Ramachandraiah G (2005) Seasonal distribution and contamination levels of total PHCs, PAHs and heavy metals in coastal waters of the Alang-Sosiya ship scrapping yard, Gulf of Cambay, India *Chemosphere* 61: 1587 – 93
Srinivasa Reddy M, Basha S, Savan Kumar V G, Joshi H, Ghosh P K (2003) Quantification and classification of ship scrapping waste at Alang-Sosiya India *Maritime Pollution Bulletin* 46: 1609 – 1614
Srinivasa Reddy M, Basha S, Sravan Kumar V G, Joshi H, Ramachandraiah G (2004) Distribution, enrichment and accumulation of heavy metals in coastal sediments in Alang-Sosiya ship scrapping yard, India *Marine Pollution Bulletin* 48: 1055 – 59
Stopford M (1997) *Maritime Economics* (2nd edition) London: Routledge
Warde A (2005) Consumption and theories of practice *Journal of Consumer Culture* 5: 131 – 53
Wu B (2004) Participation in the global labour market: experience and responses of Chinese seafarers *Maritime Policy Management* 31: 69 – 82
Wu B, Morris J (2006) A life on the ocean wave: the post socialist careers of Chinese, Russian and East European seafarers *International Journal of Human Resource Management* 17: 25 – 48
YPSA (2005) Workers in shipbreaking industries: a baseline survey of Chittagong (Bangladesh) YPSA Chittagong, Bangladesh.