

PhD in Electronic and Electrical Engineering 2011

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Radical Plumbers and PlayPumps

Objects in Development

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Abstract

This thesis analyses the *PlayPump*, a water pump powered by a children's roundabout, designed for use in the developing world. The *PlayPump* is analysed as an example of 'design for development', an area of current design attention to the developing world, and also as an example of objects that combine instrumental functions for the user, with communication to audiences. The *PlayPump* has been advanced through the compelling image it suggests to first world audiences, of children's play effortlessly accomplishing a social good, despite its failures for users on the ground in the developing world. In this thesis, the *PlayPump* is examined using a framework constructed from the analysis of similarly communicative, multifunctional objects taken from other disciplines and contexts. These disciplines and contexts are: the appropriate technology 'movement', which is an ancestor to and influence upon design for development; interventionist art; critical design; and activist practices in the developing world. The thesis calls too on recently available reports on the *PlayPump*, synthesizing across studies to produce a set of ten main faults in the *PlayPump* system as experienced by users on the ground. Through these combined perspectives, the *PlayPump* is revealed as an object that prioritises benefit to its producers and partners, and the maintenance of its image to audiences, over the needs of users in the developing world. In the conclusion to the thesis, the arguments produced around the *PlayPump*'s prioritizing of first world audiences over developing world users are applied to the broader field of design for development, identifying the risks in its ways of operating. In closing, a broader view of 'objects in development' is proposed, suggesting that objects which act for users and communicate to audiences should be analysed with the same multidisciplinary gaze brought to the analysis of the *PlayPump*.

Summary

This thesis analyses the *PlayPump*, a water pump powered by a children's roundabout, which is designed for use in the developing world. The *PlayPump* is analysed as an example of 'design for development', an area of current design attention to the developing world, and also as an example of objects that combine instrumental functions for the user with communication to audiences. The *PlayPump* has been advanced through the compelling image it suggests to first world audiences, of children's play effortlessly accomplishing a social good, despite its failures for users on the ground in the developing world.

Chapter 1 introduces the thesis. In Chapter 2, design for development is described and analysed. Three main characteristics of design for development are identified: it is 'highly visible', having a high public profile; it makes claims of high impact for small-scale object-based solutions; and it frames objects designed for the developed world as symbolic and communicative, using them as tools for advocacy to first world audiences. The chapter also identifies the way design for development is characterised by some curators and practitioners as a growing 'revolution in design', that is shifting attention from design for first world 'desires', towards the 'needs' of the developing world. This characterisation is interrogated in Chapter 9, the conclusion to the thesis, through the in-depth analysis of the *PlayPump* that takes place in Chapters 7 and 8.

In Chapters 7 and 8, the *PlayPump* is analysed using an analytic framework constructed through the analysis of similarly communicative, multifunctional objects from other disciplines and contexts. These objects, and the texts used to analyse them, are taken from the fields of: appropriate technology; interventionist art; critical design practice; and activist practices in the developing world. These four arenas are analysed in each of the chapters 3 through 6, as outlined below.

Chapter 3: Fluid technology, traces the history of the appropriate technology movement as an influence on design for development, starting with the major figure referred to by contemporary practitioners, the economist E.F. Schumacher. The chapter notes changes in the field over time. One of the main observations in the chapter is around how objects designed for the developing world began to acquire first world audiences, taking the 'clockwork radio' as a seminal example of a new waves in objects designed ostensibly for developing world use. A long-standing appropriate technology object, the Zimbabwe Bush Pump, is analysed using a text that defines its appropriateness as 'fluidity'.

Chapter 4: Art intervenes, notes the interest of some contemporary artists in design for development and appropriate technology, as part of a wider twentieth century movement into the appropriation and production of functional objects by artists. The artists producing these objects do not abandon representation and communication, but continue to seek audiences as they equip users. Examples are drawn from the confluence of this kind of work with an activist or ‘interventionist’ urge in contemporary art.

Chapter 5: Critical design, examines the work of industrial design academics Professor Anthony Dunne and Fiona Raby – together the design duo ‘Dunne & Raby’ – who have defined a ‘critical design’ practice that draws from the arts to produce part-fictional functional artifacts, intended to catalyse debate on social issues. The chapter investigates product design as a medium for social enquiry, questioning the ‘affirmative’ or ‘productive’ stance of mainstream design.

Chapter 6: Antiprograms, examines the direct actions of a developing world activist organisation, the Anti Privatisation Forum (APF) in securing access to water and electricity for poor South Africans, while conducting protests and taking part in legal actions against state policies around privatisation of services. The APF are the ‘radical plumbers’ referred to in the title to the thesis. In acting immediately while communicating to audiences, the APF is seen in parallel with the other examples of similarly multifunctional objects in this thesis, including the *PlayPump*.

The thesis calls too on recently available evidence of the *PlayPump*’s performance in the field, which are synthesizing into a set of ten main faults in the *PlayPump* system, as experienced by users on the ground. Chapters 7 and 8 apply the perspectives gained across the previous chapters, as described, along with this information, to thoroughly reanalyse the *PlayPump*.

Through these combined perspectives, the *PlayPump* is revealed to be an object that prioritises benefit to its producers and partners, and the maintenance of its image to audiences, over the needs of users in the developing world. In the conclusion to the thesis, the arguments produced around the *PlayPump*’s prioritizing of first world audiences over developing world users are applied to the broader field of design for development, identifying the risks in its ways of operating. In closing, a broader view of ‘objects in development’ is proposed, suggesting that objects which act for users and communicate to audiences should be analysed with the same multidisciplinary gaze which was brought to the analysis of the *PlayPump*.

Acknowledgements

Thank you to my supervisor Linda Doyle; Mick Wilson for his co-supervision at the start of my research; my parents Rob and Jacquie Borland and my sister Katie Borland; Seoidin O’Sullivan my collaborator on Tactic, an activist art collaboration which helped me to explore some of my ideas here. Thank you Michael John Gorman and the Science Gallery for introducing me to the Idea Translation Lab at Harvard, whose workshops and events contributed to my research. Thank you to my friends who read and commented on my thesis, particularly Ben Stewart.

Thank you to Alex Wafer for taking me to Alexandra township with the SECC; Anthony Dunne for his interview and Fiona Raby for her conversation; Peter Morgan for his time in discussing the Zimbabwe Bush Pump; Mark Melman at Roundabout Outdoor; and Steve Hunt and David Grimshaw at Practical Action for their interviews.

Thank you to the National Research Foundation (NRF) of South Africa and the Oppenheimer Memorial Trust for their part in funding my research. The financial assistance of the National Research Foundation (NRF) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at, are those of the author and are not necessarily to be attributed to the NRF.

Table of Contents

Abstract	ii
Summary	iii
Acknowledgements	v
Table of Contents	vi
 Chapter 1: Introduction	
1.1 Introduction	1
1.2 Structure of the thesis.....	6
1.3 Contributions	12
 Chapter 2: Design for development	
2.1 Introduction	15
2.2 Design for development	16
2.2.1 High visibility	17
2.2.2 Claims of high impact for small-scale interventions	21
2.2.3 Symbolic and communicative aspects	23
2.2.4 ‘A revolution in design’	24
2.3 The <i>PlayPump</i>	26
2.4 Discussion	32
2.4.1 High visibility	33
2.4.2 Claims of high impact	38
2.4.3 Representations of the <i>PlayPump</i>	41
2.5 Late developments	45
2.6 Summary	46

Chapter 3: Fluid technology

3.1 Introduction	49
3.2 Appropriate technology	50
3.2.1 ‘Small is Beautiful’	50
3.2.2 Critical attitudes	53
3.2.3 Divergent trajectories	54
3.2.4 Acquiring first world audiences	57
3.3 The Zimbabwe Bush Pump	60
3.3.1 History	62
3.3.2 Mechanics	64
3.3.3 Maintenance	66
3.3.4 Funding	68
3.3.5 Installation	69
3.3.6 Performance	71
3.4 Discussion	72
3.4.1 Fluidity	72
3.5 Summary	80

Chapter 4: Art intervenes

4.1 Introduction	83
4.2 Functional and interventionist art	84
4.3 <i>paraSITE</i>	90
4.4 <i>Brinco</i>	93
4.5 Discussion	96

4.5.1 Insertions into circuits	96
4.5.2 ‘Critical vehicles’	103
4.6 Summary	110
Chapter 5: Critical design	
5.1 Introduction	113
5.2 Critical design	114
5.3 <i>Placebo project</i>	120
5.4 <i>Is this your future?</i>	124
5.5 Discussion	127
5.5.1 ‘Para-functionality’	128
5.5.2 ‘Material tales’	132
5.6 Summary	135
Chapter 6: Antiprograms	
6.1 Introduction	137
6.2 Contesting development	138
6.3 The APF	141
6.3.1 The free basic water allowance	143
6.3.2 Effects of the prepaid meter	145
6.3.3 Returning issues to debate	146
6.4 Discussion	148
6.4.1 Programs and antiprograms	148
6.4.2 Protest and participation	153
6.5 Summary	156

Chapter 7: Reanalysing the *PlayPump* 1: performance

7.1 Introduction	159
7.2 Reanalysing the <i>PlayPump</i>	160
7.3 Suspicions aroused by the <i>PlayPump</i> 's claims	163
7.4 Ten faults identified in the <i>PlayPump</i> system	168
7.5 The fluidity of the <i>PlayPump</i>	182
7.5.1 ...of its boundaries...	182
7.5.2 ...of its working order...	193
7.5.3 ...and of its maker.	200
7.6 Summary	205

Chapter 8: Reanalysing the *PlayPump* 2: critical lenses

8.1 Introduction	213
8.2 Critical lenses	213
8.3 Art intervenes	215
8.3.1 Insertions into Circuits	216
8.3.2 'Critical vehicles'	226
8.4 Critical design	231
8.4.1 'Para-functionality'	232
8.4.2 'Material Tales'	236
8.5 Antiprograms	241
8.5.1 Programs and antiprograms	242
8.5.2 Protest and participation	246
8.6 Summary	252

Chapter 9: Conclusion

9.1 Introduction	261
9.2 The <i>PlayPump</i>	262
9.3 Reflecting on design for development	273
9.3.1 High visibility	273
9.3.2 Claims of high impact	275
9.3.3 Symbolic and communicative aspects	277
9.3.4 ‘A revolution in design?’	279
9.3.5 Conclusions	283
9.4 Objects in development	288
9.5 Contributions	289
9.6 Future work	292
Works cited	297



Fig 1.1 Ralph Borland, *Suited for Subversion* (2002). Photograph by Pieter Hugo.

Chapter 1

Introduction

A question posed by *Suited for Subversion* is whether the piece should be regarded as a functional object or as artistic speculation. One of the essential features of modern art, a heritage of Dada, is to blur these boundaries.

Robert S. Mattison, Marshall R. Metzgar Professor of Art History, Lafayette College, *Amour d'Armor* exhibition brochure, 2007

1.1 Introduction

The seed for this thesis was planted in 2005, as I tried to interpret the sudden success of an art-design project I had made, *Suited for Subversion*, as it was selected for exhibition on the group show *SAFE*, which opened that year at the Museum of Modern Art in New York. It was subsequently bought by the museum for their collection, and has been exhibited several times since. *Suited for Subversion* became one of the iconic images of the show, selected by e-flux¹ as the image to announce the opening of the exhibition, reproduced in the mainstream tabloid newspaper the *New York Post*, and on television and in the international media.

Suited for Subversion, pictured in fig 1.1 opposite, as staged by the photographer Pieter Hugo, is a prototype for an inflatable suit designed to protect the wearer at large scale street protests. It contains a pulse-reader and speaker that projects the wearer's heartbeat out of their body, making it audible to others. The project came out of my experience taking part in street protests in New York, where police would routinely corral protestors into confined 'protest zones', minimising their disruption of public space. I designed the suit as an expression of my frustration at being contained in this way, as a fantasy of equipping myself to break through barriers to protest, and as a humorous admission of the performance aspect of protest, permitted and contained as it is by the state, in first world settings.

¹ e-flux is "an international network which reaches more than 50,000 visual art professionals on a daily basis through its website, e-mail list and special projects. Its news digest... distributes information on some of the world's most important contemporary art exhibitions, publications and symposia" (e-flux 2010).

In 1963, Malcolm X was to say of the agreements civil rights leaders reached with the state before a mass demonstration that took place in Washington DC, with its plans for civil disobedience including lying down in front of aeroplanes at JFK airport abandoned in favour of permission for the rally and safety for its participants:

This is what they did to the march on Washington. They joined it... became part of it, took it over. And as they took it over, it lost its militancy. It ceased to be angry, it ceased to be hot, it ceased to be uncompromising. Why, it even ceased to be a march. It became a picnic, a circus. Nothing but a circus, with clowns and all... (Zinn 2001, p.458)

In my brightly coloured, over-protective suit, I suggested I was that clown, performing within the boundaries I was allowed by the state – and at the same time the suit made a gesture at resistance to those boundaries, building on the existing practices of activist groups in Europe and the United States that built themselves body armour to break police lines at protests. But my suit was designed to communicate in particular ways to observers: it uses the iconography of a target, bright red, with the seams of the suit forming cross-hairs over the chest of the wearer – it is not evading aggressive attention, but apparently inviting it, or perhaps communicating the wearer's sense of *being* a target. It is as much about drawing attention to the fact that one needs to protect oneself from the police in order to protest effectively, as it is a tool for protest. As armour it is not hard-edged and aggressive, but soft, rounded, comic: as much as my suit is armour, it is also disarming; as much provocation as protection. The projection of the wearer's heartbeat outside of their body was likewise an ambiguous gesture: I saw it as simultaneously powerful, amplifying the surge of blood through the body, projecting the wearer's bodily sounds out into the environment – and also vulnerable, revealing, transparent.

But while this communicative language encoded in the suit has helped its success as an image, taken up into museums, galleries and the press, it has never demonstrated its effectiveness on the ground, in the contexts for which it was designed. I'm always a little embarrassed to admit that I've never worn it to a protest, partly because the original prototype I made in 2002 was not inflatable, but stuffed with newspaper, and very hot and heavy as a result. I was afraid to wear it, in case I got knocked down and suffocated in it. The suit now in the NY MoMA is better made, though still not inflatable – and by the time it was exhibited there, three years had passed and the contexts for my activism had changed. I had moved back from New York to South Africa, and the humour and provocation of the suit seemed a world away from the situation there, where police are more likely to shoot protestors than merely contain them.

Both the success of the suit as image, versus its lack of proven effectiveness in use, and the different contexts for the interactions of the state and citizens in the North and South of the world got me to thinking, in ways that have led to the research in this thesis. I became interested in objects that combine instrumental value for the user, with communication to audiences, and I started to locate examples of these across arenas. Some of these objects were exhibited alongside my work on *SAFE*; NY MoMA design curator Paola Antonelli had selected a diverse range of objects along the theme of protection, including: 1) work by interventionist artists, 2) critical design projects, and also what the NY MoMA refers to as ‘design for the developing world’, and this thesis calls, 3) ‘design for development’²: objects designed for accessing basic resources, for use mainly by people in the developing world. To these three arenas I added a fourth: the grassroots activism of organisations in South Africa such as the Anti Privatisation Forum (APF), which protests the state’s policy of water privatisation and cost-recovery by removing the ‘prepaid’ water meters installed by the state, and reconnecting the supplies of people cut off for non-payment. The APF too, it seemed to me, was something like an object³ which functions immediately, to connect people to resources, while also communicating to audiences through their civil disobedience, protest marches and legal challenges to the state.

The main object studied in this thesis, the *PlayPump*, is a South African invention that is in some ways similar to the APF, and at the same time almost its antithesis in the kinds of messages it communicates. A children’s roundabout that pumps water, and which is funded by advertising on billboards attached to the system’s elevated water tank, the *PlayPump*, like the other objects in my thesis, acts immediately for the user, and also communicates to audiences: the *PlayPump* has been highly successful at engaging first world audiences with its promise of work achieved through children’s play. My first interest in it was as an example of an object that provided water to poor South Africans, and at the same time produced narrative images: it seemed to me something like an artwork in its ability to communicate. The APF too supplies water to poor South Africans, but the image it communicates to audiences is very different to the *PlayPump*’s: it is not aiming to win over audiences through cheerful, positive

² This is not a highly significant choice, but one made to expand the frame slightly to include designing for social issues outside of the ‘developing world’. Design for development as a term has precedent, see Coward & Father 2005, South African Bureau of Standards 2002.

³ “The category ‘object’ does not convincingly divide the natural from the artificial world, the material from the immaterial, the animate from the inanimate, or the human from the non-human” (Candlin & Guins 2009, p.2).

images, but through expressions of resistance and anger. The APF's image seemed a more realistic depiction of the South African social and political landscape than the *PlayPump*, but I was interested in the juxtaposition of the two 'objects', or actors. From the start my research project was titled 'Radical Plumbers and PlayPumps' – now the title of this thesis.

My research began with a constellation of examples of multifunctional, communicative objects from different arenas to work from – more or less the same objects that are in my thesis now – but without a specific target for the investigation. Design for development emerged early on as this target because it is the field with the most possible *consequence*; while the artwork and critical design were fascinating, no-one claimed that these objects would change the world. While making shelters for the homeless, or devices to protect people from electromagnetic fields in the home, most practitioners saw their work as of limited use to a few users, in specific contexts. The main purpose of their work was to catalyse debate around the social issues causing the vulnerability of the people they were equipping. These artists and designers acknowledged the limited impact of their apparatus.

In contrast, the discourse in design for development made enormous claims for the impact of this work designing small-scale objects for use in the developing world, such work was generating a great deal of attention, and attracting large amounts of funding. In 2006, soon after I had started looking at the *PlayPump*, it received a commitment for US\$60 million dollars from a coalition of charitable foundations in the United States, and the US government, to launch a programme to bring water to 10 million people across Africa (PlayPumps International 2007). This was the area I wanted to look into, to investigate whether these designed objects could really deliver on the promises made for them. In this I was continuing my previous work both as an activist and as an artist – the models of art that I am interested in aim to reveal the workings of systems in society and to communicate them to others: an urge sometimes called 'interventionist', and the subject of Chapter 4: Art intervenes.

The thesis then began to form around the *PlayPump*, as an example of contemporary design for development that might reveal the relationship between the use of objects in this area of production for advocacy around developing world issues – for their 'story-telling' capacity – and their use by users in the developing world. I suspected that the claims made by such objects were exaggerated, because the language of the arena did not admit to the complexity of the problems I saw in South Africa, and because what little I already knew about functional objects that communicate indicated that there might be a pay-off between instrumental value for the user, and the communication of compelling narratives to the viewer. Was it possible

that an object like the *PlayPump* was good at doing both, or was it perhaps better as an image than it was as a tool for users?

These were the suspicions with which I began my thesis. With no information available about the performance of the *PlayPump* in the field – its manufacturers had never evaluated the system, and there had been no independent studies of it, to my knowledge – my technique was to compare it to the other objects I had gathered in my ‘constellation’. Comparing it to an example of a well-evaluated and highly successful ‘appropriate technology’ (which the *PlayPump* claims to be), the Zimbabwe Bush Pump, gave me some direct ways of interpreting the little information about the system produced by its manufacturers. This comparison fuelled my suspicions about the *PlayPump*’s claims: it apparently pumped water almost twice as fast as the exceptionally competent Zimbabwe Bush Pump, though it used an ordinary borehole pump to do so, and it claimed to supply 10 times more people. From my investigation of the APF and the prepaid meter, I learnt about minimum standards for water provision in South Africa: and according to this data, the *PlayPump*’s claims for the number of people it could supply seemed vastly exaggerated.

I also examined the *PlayPump*’s image, the messages and narratives it communicated, from the perspective of the interventionist artworks and critical design projects I had researched, in order to isolate the type of messages the *PlayPump* was communicating to audiences. In comparison to their depiction of social problems, and of the limited role technological fixes could play in resolving them, versus the role policy makers and states could play, the *PlayPump*’s messages seemed distorted. In comparison with the APF’s experience of the private sector’s role in supplying water to poor South African’s, the *PlayPump*’s depictions seemed to conceal more than they revealed.

Then in late 2009, three years after I began my research, suddenly, the major US organisation set up to promote the *PlayPump* internationally withdrew from the project, and some documents that had previously been suppressed became available, identified by one or two critical articles that appeared in the press. I now had access to reports commissioned by UNICEF and by the Mozambiquan government into the *PlayPump*. These documents demonstrated that my suspicions were correct, and that indeed the *PlayPump* did not live up to its claims, and was frustrating users whose previous pumps had been replaced by *PlayPumps*. I could now draw on this material in my research, which not only validated my earlier suspicions, but allowed me to write a much more detailed and comprehensive analysis of the project – though one enabled by the perspectives I had generated through looking widely from across disciplines.

1.2 Structure of the thesis

The results of my research in this thesis demonstrate that the *PlayPump* has been advanced through the compelling image it suggests to first world audiences, of children's play effortlessly accomplishing a social good, despite its failures for users on the ground in the developing world. This illustrates a fault within the current field of design for development, especially in the way it targets first world audiences in the production of objects for developing world use. In order to arrive at this conclusion, I looked widely, in order to delve deeply into a singular example. Given the breadth of my research, rather than introducing all literature at the front, texts are introduced in stages throughout the thesis, along with the fields and objects covered. Here follows a brief outline of the structure of the thesis.

Chapter 2: Design for development

This chapter identifies 'design for development' as a contemporary phenomenon receiving considerable public and institutional attention through exhibitions, awards, through marketing campaigns and in the popular press. Major exhibitions, such as *SAFE* at the NY MoMA, mentioned in the introduction to this chapter, and *Design for the Other 90%*, a source of much material on design for development, are described, along with the *INDEX: Awards*, which advertises itself as the largest design prize on the planet. Three main characteristics of design for development are identified: it is 'highly visible', having a high public profile; it makes claims of high impact for small-scale object-based solutions; and it frames objects designed for the developed world as symbolic and communicative, using them as tools for advocacy to first world audiences.

The chapter also identifies the way design for development is characterised by some curators and practitioners as a growing 'revolution in design', that is shifting attention from design for first world 'desires', towards the 'needs' of the developing world. This characterisation is interrogated in Chapter 9, the conclusion to the thesis, using the analysis of the *PlayPump*.

The second half of the chapter introduces the main focus of the thesis, the *PlayPump*. The account of the *PlayPump* in this chapter is largely descriptive and based mainly on the way it is presented within the design for development arena: by its makers, institutions and in the mainstream press. The *PlayPump* is discussed in this chapter for how it fulfils the three broad characteristics of design for development identified in the first half of the chapter, identifying it as representative of this field so that analysing it further might reflect on design for development in the conclusion to the thesis.

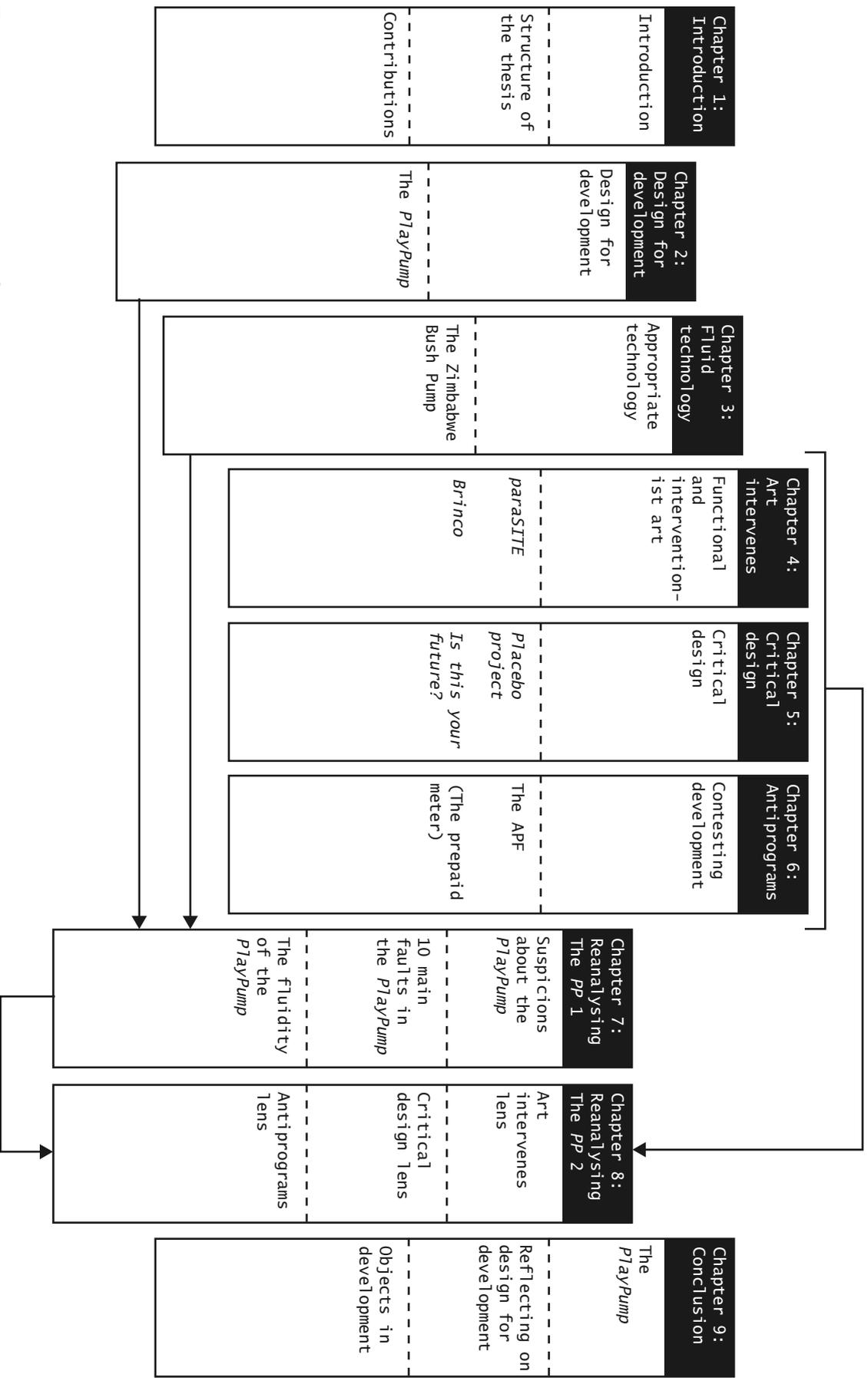


Fig 1.2: A rough map of the thesis

Chapter 3: Fluid technology

This chapter notes the identification of contemporary ‘design for development’ with the ‘appropriate technology’ movement of the 1970s. Several contemporary design for development objects, including the *PlayPump*, are described as appropriate technologies by their makers and by curators and journalists. The chapter traces the history of appropriate technology, starting with the major figure referred to by contemporary design for development practitioners, the economist E.F. Schumacher, noting ways in which the field has changed between its beginnings and now. One of the main observations this first half of the chapter makes is around how objects designed for the developing world began to acquire first world audiences, taking the ‘clockwork radio’ as a seminal example.

In the second half of the chapter, a long-standing and highly successful appropriate technology, the Zimbabwe Bush Pump, is described and then discussed. The Zimbabwe Bush Pump makes a good subject of study for this chapter because it is a water pump that expresses many of the attributes of an ‘original’ appropriate technology, and because it operates in the same general area as the *PlayPump*.

It is also useful to this thesis because of the creative work that has gone into analysing it, in a paper by science, technology and society scholars Ann Marie Mol and Marianne de Laet titled ‘The Zimbabwe Bush Pump – Mechanics of a Fluid Technology’ (2000). De Laet and Mol use the metaphor of ‘fluidity’ to express the qualities that make the pump a successful appropriate technology. Their formulation of fluidity is used again in Chapter 7 to reanalyse the performance of the *PlayPump*, interrogating its claims to be an appropriate technology.

Chapter 4: Art intervenes

This chapter notes the interest of some contemporary artists in design for development and appropriate technology, as part of a wider twentieth century movement into the appropriation and production of functional objects by artists. The artists producing these objects do not abandon representation and communication, but continue to seek audiences as they equip users. The first half of the chapter identifies a trajectory for this kind of work: from appropriating functional objects divorced from their original context, through appropriating functional objects with reference to their ‘real-world’ use, to creating novel functional objects designed to communicate issues: from framing to synthesising. Examples are drawn from the confluence of this kind of work with an activist or ‘interventionist’ urge in contemporary art. Artists performing this type of work push art into the territory of design, as the designers in

Chapter 5 look to the arts for their inspiration: collectively they blur the boundaries between the two disciplines.

In the second half of the chapter, two art projects are examined in detail: Michael Rakowitz's *paraSITE*, a series of inflatable homeless shelters, and Judi Werthein's *Brinco*, a limited run of factory-made custom sneakers for Mexican border-jumpers. Their work with identifying, revealing and manipulating systems in society is framed as part of a wider focus in interventionist art, using the work of the Brazilian conceptual artist Cildo Meireles, 'Insertions into Ideological Circuits' (1970), which describes techniques for getting messages into public circulation; and through the artist-designer Krzysztof Wodiczko's proposal for 'critical vehicles', functional objects for equipping the marginalised while communicating the circumstances of their vulnerability to the wider public.

Chapter 5: Critical design

This chapter examines the work of industrial design academics Professor Anthony Dunne and Fiona Raby – together the design duo 'Dunne & Raby' – who have defined a 'critical design' practice that draws from the arts to produce part-fictional functional artifacts, intended to catalyse debate on social issues. The chapter investigates product design as a medium for social enquiry, questioning the 'affirmative' or 'productive' stance of mainstream design. Where the previous chapter showed artists crossing into the territory of design, this chapter shows designers crossing into the territory of art.

Critical design and design for development are described as on either end of a spectrum of response to mainstream design practice – where design for development aims to supply the needs of a different set of 'clients', critical design more fundamentally questions the productive drive of design. Both fields communicate to audiences through the use of functional objects, using 'industrial design' as a popular medium for communication to publics. But unlike design for development, critical design objects are not intended to have a large-scale impact on social issues through their immediate use.

The second half of the chapter focuses on Dunne & Raby's work *Placebo Project* and *Is this your future?* as examples of their practice. Through describing and discussing these projects the chapters drew out their ideas and terminology to describe facets of a critical design practice, offering a vocabulary to the thesis to describe the ways in which objects might have extra-instrumental functions: these are grouped under the headings 'Para-functionality', which describes how function can be a form of criticism, and 'Material Tales', which explores their

use of objects as characters that evoke narratives. The main texts used to analyse their work are Dunne's *Hertzian Tales* (2005) and *Design Noir – The Secret Life of Electronic Objects* (2001), by Dunne & Raby.

Chapter 6: Antiprograms

This chapter examines the direct actions of a developing world activist organisation, the Anti Privatisation Forum (APF) in securing access to water and electricity for poor South Africans, while conducting protests and taking part in legal actions against state policies around privatisation of services. The APF are the 'radical plumbers' referred to in the title to the thesis. In acting immediately while communicating to audiences, the APF is seen in parallel with the other examples of similarly multifunctional objects in this thesis, including the *PlayPump*. The first half of the chapter contextualises the APF's actions, especially the removal of 'prepaid' water meters, within the resistance to some measures for development in the developing world, providing a contrasting narrative to the image of the developing world presented in design for development forums.

The second half of the chapter describes the multivalent actions of the APF, and the effects of the installation of prepaid water meters on poor communities around Johannesburg, in greater detail. The prepaid water meter is described as a type of design for development object, and it is interpreted as having 'political properties' via Langdon Winner's identification of apparatus used as a way of settling issues in society. The APF's removal of prepaid water meters is seen through Bruno Latour's formulation of 'programs', enacted by the state, and 'antiprograms' of resistance to their plans. The APF is understood as trying to return an issue enforced through a technological fix, to the realm of debate: to return 'steel to words'. South African academic Isaac Davids' depiction of 'provided' and 'popular' spaces for participation are used to frame their actions as combining 'protest and participation' in this way.

Chapter 7: Reanalysing the *PlayPump* 1: performance

This chapter is the first half of a two-part analysis of the *PlayPump*, which uses perspectives arrived at through the previous chapters to deeply interrogate the *PlayPump*. It analyses the performance of the *PlayPump* using recently available information about the *PlayPump*'s performance in the field, and De Laet and Mol's formulation of fluidity as appropriateness, derived from the work performed in Chapter 3: Fluid technology. This analysis is juxtaposed against the manufacturer's claims for the *PlayPump*'s impact and performance, which were detailed in Chapter 2: Design for development.

The chapter introduces several sources of evidence for the *PlayPump*'s performance that only became available in late 2009 and early 2010, late in the research for this thesis, as described in the introduction to this chapter. These sources are detailed in Chapter 7. The *PlayPump*'s performance is then analysed, first through establishing some suspicions generated by comparison between it and the Zimbabwe Bush Pump, and with what was learnt about standards for water provision in South Africa, in Chapter 6.

From these suspicions, the chapter moves to an analysis that draws material from across all sources of recently available evidence to establish a set of 10 main faults in the *PlayPump* system. These faults are added to what was already learnt about the *PlayPump* in Chapter 2: Design for development. The *PlayPump* is then analysed using De Laet and Mol's account of the Zimbabwe Bush Pump's 'fluidity', to establish what fluidity might be in the *PlayPump* system, and so to interrogate its claims to be an appropriate technology. This highly detailed analysis demonstrates that the fluidity of the *PlayPump* is in different places, and is of a different order to the Zimbabwe Bush Pump's. The chapter concludes with an overall evaluation of the *PlayPump*'s performance and fluidity, which is carried forward into Chapter 8, the second part of the analysis of the *PlayPump*, where it is analysed further from the perspectives of interventionist art, critical design, and activist practice.

Chapter 8: Reanalysing the *PlayPump* 2: critical lenses

This chapter is the second half of the reanalysis of the *PlayPump*. Where the first half of the reanalysis looked mainly at the performance of the *PlayPump* in the field, interrogating its claims to be an appropriate technology, this second part uses the perspectives generated in chapters 4, 5 and 6 – from interventionist art, critical design, and the struggle of the APF against the prepaid meter – as a series of 'critical lens' through which to further analyse the *PlayPump*. These critical lenses draw mainly on the descriptions and analyses of selected examples in the second half of each of these chapters – the first, contextualising half of each chapter adds more to the conclusion of the thesis, in Chapter 9.

The perspectives arrived at in Chapter 4: Art intervenes are applied to the *PlayPump* to observe in what ways, and for what purposes it enters into or redirects circuits in society, and how it equips users while communicating to audiences. Concepts from Chapter 5: Critical design are applied to the *PlayPump* to ask in what ways it could be characterised as a 'para-functional object', and what kinds of narratives it presents: what kind of 'material tale' it is. Chapter 6: Antiprograms is used to interpret the *PlayPump* as an embodiment of a 'program', analysed for how it prescribes behaviours in its users, and for its interaction with participative structures.

While continuing the work of Chapter 7 in examining the *PlayPump*'s performance, this chapter pays particular attention to the way the *PlayPump* can be 'read'. This type of characterisation of the *PlayPump* began in Chapter 2: Design for development, where several representations of the *PlayPump* – the *PlayPump* as symbol or image – were noted. The application of the 'critical lenses' in this chapter, attempting to read the *PlayPump* in imaginative ways, results in work that is more speculative and questioning than the more direct analysis of the *PlayPump*'s performance in Chapter 7.

Chapter 9: Conclusion

This chapter, the conclusion to the thesis, uses the perspectives gathered in Chapter 7 and Chapter 8, together with the first account of the *PlayPump* in Chapter 2, to construct an overall picture of the *PlayPump* which connects these observations: it re-presents the *PlayPump*. The implications of the arguments and observations of the *PlayPump* arrived at in this section are used to reflect on the broader field of design for development, revisiting it through the three main characteristics identified in Chapter 2, and arguing for what the consequences of these characteristics might be. After concluding these arguments on design for development, a broad view is proposed for the possible roles of 'objects in development', drawing on the range of examples from different fields investigated in the thesis. These three main sets of conclusions are followed by a summary of the contributions made by the thesis, and a suggestion of further work made possible by the thesis, in closing.

1.3 Contributions

The thesis makes a number of contributions. Firstly and most significantly, it provides a complex multidimensional portrait of the *PlayPump* that allows it to be analysed to a level of depth and rigour to which it has not been subjected so far. This multidimensional portrait is constructed by applying a series of 'lenses' to the pump, starting with the perhaps more obvious lens of science and technology studies, via De Laet and Mol's analysis of the Zimbabwe Bush Pump, and moving on to apply an interventionist art lens, a critical design lens and an activist, or 'antiprograms' lens. Different aspects of the *PlayPump* are systematically examined by drawing on key texts and, more importantly, through reading and analysing objects and practices within these different fields, in conjunction with these written texts.

Along the way to constructing this multidimensional portrait a number of other contributions are made. The highly perceptive and nuanced approach of de Laet and Mol in their analysis of the Zimbabwe Bush Pump is applied to the *PlayPump* and extended beyond its original

boundaries to fully engage with the first world's relationship with the developing world as embedded in the *PlayPump*. The interventionist art works of key artists are analysed in a wider academic context and applied to the *PlayPump* in a creative and critical manner. The concepts of 'critical design' are extended to the developing world and Bruno Latour's concept of programs and antiprograms is used to position the *PlayPump* against alternative, less ameliorative actions in dealing with water issues in the developing world. These different ideas and perspectives, and the output of the more traditional reports on the *PlayPump* recently available, are tightly woven together to produce an intricate set of observations about the *PlayPump*.

These observations reveal much about the wider systems in which the *PlayPump* sits, the relative importance of different parts of those systems, the limitations of the *PlayPump*'s performance, an understanding of the communicative nature of the object itself, an understanding of its target audiences and an overall understanding of emerging issues in the designing of objects for the developing world.

In sum the thesis suggests a more critical framework in which to consider the *PlayPump* and ultimately to consider objects in development in general, than is currently apparent.

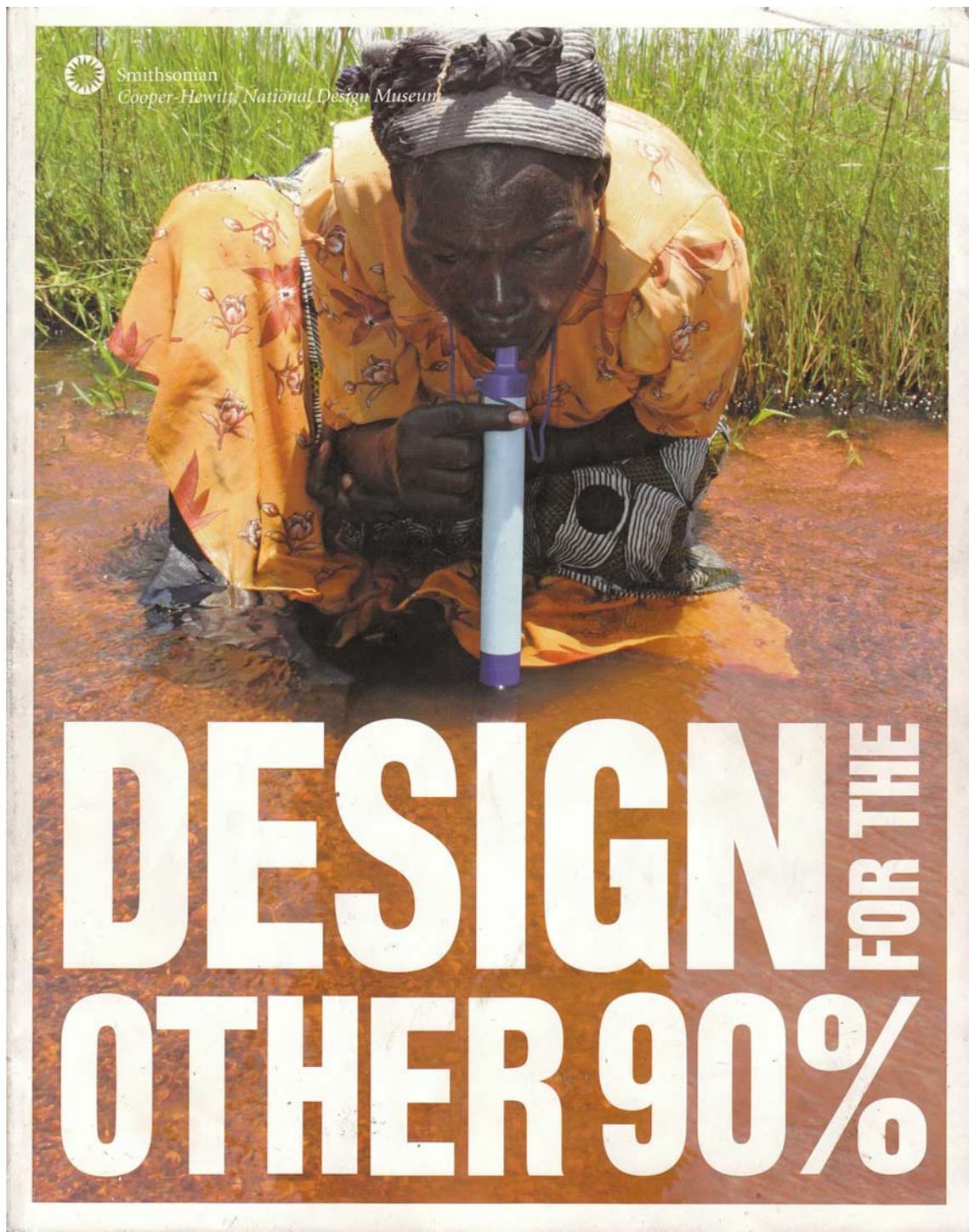


Fig 2.1: Cover of the exhibition catalogue for *Design for the Other 90%* (my copy). The background photograph is a promotional image by Vestergaard-Frankin for their *Lifestraw* personal water-filtering device.

Chapter 2

Design for development

Ninety-five percent of the world's designers focus all of their efforts on developing products and services exclusively for the richest ten percent of the world's customers. Nothing less than a revolution in design is needed to reach the other ninety percent.

Paul Polak, 'Design for the Other 90%', *Design for the Other 90%*, 2007, p.19

2.1 Introduction

This chapter identifies 'design for development' as a contemporary phenomenon receiving considerable public and institutional attention through exhibitions, awards, through marketing campaigns and in the popular press. Design for development is the design of objects for accessing basic resources – water, energy, food, shelter – for use mainly by people in the developing world.

The coverage of this field by the press and institutions has been largely descriptive and celebratory rather than critical or analytic. The field is presented as growing, and the claims made for its impact on large-scale problems in the developing world is high. Examples of work in this field are exhibited in part as symbolic objects that communicate to first world audiences the problems of the developing world and the possibility for addressing these problems through innovative, small-scale interventions. Some of the most visible projects reach this first world audience through selling the objects themselves to users in the first world, or through other campaigns for funding the donation of these objects to developing world users. Contemporary work in the field tends to be presented by design institutions and producers of design for development as reforming the practice of design from that of designing luxury goods for first world 'desires', to a focus on the 'real needs' of the majority of the world's population, who lack access to basic goods and services.

The first half of this chapter identifies the attention paid to this area of production, and the claims made about its growth and impact, in order to demonstrate that this field has consequence, attracting public and institutional support, and so needs to be examined more critically than it is at present. The observation that objects in this field are treated in part as

symbolic, and are used as a medium for communication to first world audiences, frames the selection in the second half of this chapter of a design for development object that has been particularly successful as an ‘image’ for first world audiences.

This object, the *PlayPump*, a water-pump powered by a children’s roundabout, is the main focus of this thesis. Analysed as a unique example in its own right, it is also used to further analyse the characteristics of design for development established in this chapter, including its claim to be a ‘revolution in design’. It is investigated as an example of the possible consequences of producing objects for developing world use that rely for their success on their ability to excite the imaginations of first world audiences.

The account of the *PlayPump* in this chapter is largely descriptive and based mainly on the way it is presented within the design for development arena: by its makers, institutions and in the mainstream press. It is discussed in this chapter for how it fulfils the broad characteristics of design for development identified earlier, identifying it as representative of this field, so that analysing it further might reflect on design for development in the conclusion to this thesis. The *PlayPump* is reanalysed in depth in Chapters 7 and 8: Reanalysing the *PlayPump* 1 & 2, using analyses of similarly multifunctional, communicative objects from other arenas discussed in the intervening chapters of this thesis.

2.2 Design for development

This chapter’s first assertion is that the design of objects for accessing basic resources, for use mainly by people in the developing world, is receiving significant contemporary attention in the first world. This strand of design practice is variously termed ‘design for the developing world’ (Juncosa 2009), ‘design for the other 90%’ (Smith, C 2007) and ‘design for development’ (Coward & Father 2005; South African Bureau of Standards 2002). This thesis uses the term ‘design for development’, for reasons outlined in the introduction to the thesis. This is a broad field with a variety of object types within it, from simple, mechanical devices that are easily maintained and even produced by users, and that reflect the history of this field in the ‘appropriate technology’ movement – discussed in Chapter 3: Fluid technology – to more complex, mass-produced consumer products that seek first world audiences, signalling a more recent direction for this area of production.

The claim that this design field is receiving significant contemporary attention in the first world is supported through briefly surveying a small selection of high-profile forums for this work, under the heading ‘High visibility’. After this brief survey, further selected information

from these forums is used to draw out some of the ways in which this field is characterized: the claims made for the broad impact of such small-scale object-interventions; the framing and use of these objects as symbolic beyond their use-function, and as a means of communication to audiences; and the depiction of this field as a departure from mainstream design, with a growing number of designers turning their attention from ‘desires’ to ‘needs’, and from the first to the developing world.

2.2.1 High visibility

Our first example of the contemporary attention paid to design for development is a design exhibition at a major international art museum: the exhibition *SAFE* in 2005 at the New York Museum of Modern Art (NY MoMA). It was one of the first exhibitions at a major art and design institution to feature ‘design for the developing world’, the NY MoMA’s preferred term (Juncosa 2009). This was a large exhibition that brought together objects from a wide field around the theme of safety and protection. These included a number of designed objects for humanitarian aid and disaster relief, and a smaller selection of what this thesis defines as ‘design for development’ objects. These included the hand-powered *Lifeline* radio, intended for distribution in the developing world by aid agencies, as well as the iconic *FPR2* windup radio and a hand-cranked cellphone-charger, all by the same company, Freeplay; insecticide-impregnated mosquito nets; water filters; and a condom-applicator. The exhibition generated a great deal of attention in the US and international press across a range of media.



Fig 2.2: Left to right: *Lifeline* radio, *FPR2* radio, and hand-cranked cellphone charger, all by *Freeplay*, from their website.

Our second example is a recent exhibition in a major design museum that focused solely on design for development. The exhibition *Design for the Other 90%* was held at the Smithsonian’s Cooper-Hewitt National Design Museum in New York in 2007. The show exhibited an array of objects designed to improve poor people’s access to resources, and to assist them in

generating income. They range from relatively simple mechanical devices such as water-filters and manually-operated pumps, latrines, cookers and cooking fuel, cargo bicycles, furniture and housing, mosquito-nets and a low-cost prosthetic limb, to more complex and electronic devices such as mobile internet-access points, micro-film projectors for education, the *One Laptop Per Child* or *OLPC* (a laptop computer designed for use by children in the developing world), and solar electricity generators. This exhibition was a departure for the museum, which has in the past focused on high technology and first-world designer items. It is one of the first, if not *the* first exhibition at a major design museum to focus solely on design for development. It was advertised widely, including posters at street-level around New York City, reported in the international press, and the Smithsonian published a book of essays and documentation of the objects on the show that was distributed internationally.



Fig 2.3: The *OLPC* (left) and the *LifeStraw* (right), from their producers' promotional material.

Our third example of the visibility given to design for development is the Danish *INDEX: Awards*, an international design award that presents itself as “the most celebrated design prize on the planet” (Muurmand 2006), and “the world’s largest award for design” (Hvid n.d.), with prizes totalling €500,000 over five award categories. They promote the ability of “humanitarian design”, manifested mainly in small-scale objects, to “improve life” (Hvid n.d.). It is a contemporary, high profile forum for new objects designed to meet basic needs. It has given awards to prominent design for development objects: one of their recent awards was to the designers of the *LifeStraw*, a personal water-filtering device which was also used as the main publicity photograph in posters and the book cover for *Design for the Other 90%* (see fig 2.1 at the start of this chapter).

The conference *TED (Technology, Entertainment and Design)* is our fourth example: it does not focus solely on design for the developing world, but has featured some significant examples under its remit to “bring together ideas that might change the world” (Cadwalladr 2009, p.20).

TED, and its more recent international variant *TEDGlobal*, referred to in the *Guardian* newspaper in 2009 as “the coolest conference on earth”, are large-scale, glamorous events, attended by celebrities, political leaders, scientists and entrepreneurs (ibid). Archived videos of conference presentations are watched online by 300,000 people a day, one hundred million a year (ibid). Amongst the presentations, two examples of design for development stand out. In 2006 Amy Smith, director of MIT’s D-Labs (which trains students to design for the developing world) presented her project addressing the problem of deforestation caused by using trees for wood fuel in Haiti. Her team devised methods for local people to make charcoal from sugar cane waste. This, she commented to the audience, is her ‘\$100 laptop’ – an older name for the *OLPC*. The second example is a presentation by Malawian William Kamkwamba, who in 2007 presented documentation of the homemade electricity-generating windmills he engineered when he was 14 years old. This presentation in particular was very well received; Kamkwamba has spoken at *TED* since, and has gone on to publish a co-authored book about his work, *The Boy who Harnessed the Wind* (2009). The amount of attention offered by *TED* attracts other people with design for development ideas to the event, with its promise of high visibility and funding opportunities; at 2009’s *TEDGlobal*, British inventor Michael Pritchard was hugely impressed by the response to his presentation of a simple device for turning sewage water into drinking water, previously little-known: “now I’ve got major foundations coming up to me and saying they think it’s fantastic” (Cadwalladr 2009, p.20).

The fifth example of design for development’s high visibility is the popular reality-TV contest show *Dragon’s Den*. In 2007, the same year as *Design for the Other 90%* opened in New York, a group of contestants on the British series of *Dragon’s Den* won unanimous backing from its multimillionaire judges for a prototype invention for individuals in the developing world to transport and purify water, called the *ROSS*. *Dragon’s Den*, “an international brand with versions airing in countries across the globe” presents itself as a tough environment for “entrepreneurs brave enough to face the heat” in pitching business ideas to a panel of hard-headed venture capitalists (BBC 2009). The *ROSS* (recently renamed *Midomo*, c.2010), is “a household-level water transport, purification and storage solution to be purchased by humanitarian organisations and deployed for use by individuals throughout the developing world” (Red Button Design c. 2010). It is a 50-litre water tank on wheels, containing a filter system powered by the rotation of the wheels, which cleans water from unsafe sources as the user pushes the device home (see fig 2.4 below). The *ROSS* was designed by Red Button Design, a trio of former student entrepreneurs from Glasgow, whose most public face is 25-year old Amanda Jones. Jones maintains a highly visible public profile in promoting the *ROSS* – ““Press Relations Goddess”?... I’ve been termed worse!” reads an entry on the Red Button

Design blog (Jones 2009). That Red Button Design, “one of the few companies... to attract support from all five Dragons” (Bowditch 2009) appeared on *Dragon’s Den* is significant because it demonstrates the visibility of design for development to a mainstream TV audience, not only in design institutions or conferences. “Such was the interest after the broadcast that the Red Button website collapsed under the weight of hits” (Bowditch 2009). That it won is also evidence of the receptive funding environment for design for development projects, with the perception by investors – the ‘Dragons’ themselves and others – that there is public support for such projects: “two online retailers have expressed interest in marketing the *ROSS* as a “gift with conscience”” (Tinning 2007).



Fig 2.4: A 3-D rendering of the ROSS, from the Red Button Design website (left) and the IKEA *SUNNAN* Lamp, from IKEA’s website (right).

The sixth and last example in this brief survey of high-visibility forums for design for development is a campaign by international retailer IKEA for their *SUNNAN* solar-powered lamp. In June 2009 IKEA launched a marketing campaign promising to donate one *SUNNAN* lamp to UNICEF for use by children in refugee camps and remote areas, for every one of the lamps sold in its stores. IKEA’s campaign is part of a wider practice often referred to as BOGO (Buy One Give One)⁴, where purchase of a product in the first world subsidises the donation of a product to a person in the developing world. Marianne Barner, head of IKEA Social Initiative said: “We hope our lamps are a small but important contribution to improving the lives of children in developing countries” (Total Retail 2009). Retail environments, especially those of a large international shopping chain such as IKEA, could be described as public exhibition spaces with a large and diverse audience and many widespread outlets, supported by large-scale promotion and advertising through other media. Similar to the *ROSS*’s appearance on *Dragon’s Den*, *SUNNAN*’s presence in IKEA demonstrates the popular public exposure to, and interest generated in, design for development objects.

⁴ As in the BoGoLight, a popular ‘Buy One Give One’ design for development product (www.bogolight.com).

These six examples demonstrate the high visibility of design for development products in design institutions and awards, in a conference attended by high-profile figures in a range of fields and viewed by millions of people online, and in the popular forums of television and retail. This thesis documents this visibility because it indicates that first world public and institutional awareness of and support for designed-object interventions in the developing world is high, making a critical examination of this field urgent. It also makes it likely, as this thesis will argue, that this first world interest may motivate the production of objects of this type, or select for projects that are particularly successful in exciting this audience. There may be an incentive to design for this field because the press and the public, as well as professional forums, are receptive to it – a ‘market’ and audiences for these approaches exist in the first world.

2.2.2 Claims of high impact

On Red Button Design’s website, they write that they aspire to produce “products which are simple in their design and conception but have consequences on a global scale” (Red Button Design n.d.). This is a repeated formulation in the field of design for development: small-scale, simple interventions with global impact; or as IKEA’s spokesperson described the SUNNAN lamp, ‘small but important’ interventions. The water purification device inventor Michael Pritchard presented to *TEDGlobal* in 2009 is described as “a simple plastic bottle which he claims could save two-and-a-half million children’s lives a year” (Cadwalladr 2009). The ROSS was described by *The Herald* newspaper as an invention for the “Third World... that could benefit 1.2 billion people worldwide” (Tinning 2007), echoing text from Redbutton Design’s website, where they write that the ROSS is “designed to bring relief to the 1.2 billion people across the world without access to safe water” (Red Button Design n.d.).

These claims are in spite of the fact that the ROSS has yet to be tested in the field – in fact, there does not even seem to be a physical prototype of it, as the only image offered by Red Button Design is a 3-D rendering. It is more a design concept than a proven technology. The conflation of the scale of the problem – that there are 1.2 billion people without water – with the potential impact of any given means of addressing it is typical of press coverage and promotional material in this arena. We can notice the shift from ‘designed to’ to ‘could’ in the transition from Red Button Design’s promotional text to the press article in *The Herald*, where the association between the large-scale problem and the small-scale solution is made subtly stronger. Quoting figures for the number of people in the world without water, or electricity, or using other statistics related to the problem addressed by a new invention is common

practice for design for development products, from manufacturer's promotional material, to the catalogue for *Design for the Other 90%*, which includes a section devoted to global statistics of poverty (2005), or Architecture for Humanity's book *Design Like You Give a Damn* (2006), where each chapter begins with a list of similar statistics. We might call these 'spectacular statistics of lack', which any new product directed at the issue might invoke.



Fig 2.5: A photo of the *Q-drum* used to illustrate a review of *Design for the Other 90%* in the *New York Times*

The impact that the design of such objects could have on the symptoms of poverty is asserted by the curators of *Design for the Other 90%*: Bloemink writes that the designers on the exhibition are using their skills to “transform the means by which millions of people live”; some of the designers’ work while “very basic and simple” has “astonishing effects”; and through the use of the water-filters on the exhibition, for example, “countless human lives can be saved” (Smith, C 2007, p.6). Press coverage of *Design for the Other 90%* echoed their assertions of the impact and global reach of such devices. *The New York Times* published a review of the exhibition under the headline “Design that solves problems for the world’s poor” (McNeil 2007). *The New York Times*, like *The Herald* for the ROSS, amplifies the claims made by the exhibition curators. The review was illustrated with a photograph of a South African child pulling a *Q-Drum*, a rolling water-barrel that was exhibited on the show, along a dusty road (see Fig 2.5 above). The hyperbole of the *New York Times* headline – the problems of the poor will be ‘solved’ – is underscored by the example they chose to illustrate the claim: the *Q-drum*, as was acknowledged in *Design for the Other 90%*, is a prototype device for transporting water that never reached production, as it was too expensive (Smith, C 2007).

The notion that simple, small-scale designed objects can have a high impact on large-scale problems of the developing world, with which they are often associated through spectacular statistics, is promoted by producers of these objects and conveyed largely uncritically to the public by design institutions and the press. That approaches which are still in prototype, or have not yet demonstrated their large-scale impact, are celebrated, indicates the symbolic appeal of such objects and approaches – they are successful at arousing interest in ways that go beyond their efficacy in the field.

2.2.3 Communicative and symbolic aspects

The *Q-Drum* appears in *The New York Times* on the level of image – a photograph of a smiling child pulling a novel object along the road in a ‘third world’ environment. The photograph is a promotional image produced by the *Q-Drum*’s creators from limited testing of prototypes in one village in South Africa (Smith, C 2007). This is all that is available to the *New York Times* reader, who would be unaware, from the accompanying text, that the project never reached completion. A natural assumption for the reader, associating image and headline – ‘Design that solves problems for the world’s poor’ – would be that this object is a ‘solution’ to the problems of the poor.

The actual efficacy of the *Q-Drum* as illustrated in the *New York Times* seems not to matter as much to the journalist as what it is intended to do, or the narrative image it presents – of small-scale ingenuity and innovation tackling large-scale problems. The presentation of design for development objects as laudable for their intentions and as narrative-carrying appears in Smith and Bloemink’s writing in *Design for the Other 90%*. The objects on the exhibition are displayed not just for the way they function to address problems of poverty and underdevelopment, they tell us, but also for how they ‘tell stories’ about those issues and efforts: “Each of the selected objects opens a window into a unique story”, Smith writes, which “emphasize the variety of means by which designers around the world have attacked the ongoing bane of global poverty” (2007, p.13). Bloemink writes that the exhibition and catalogue are intended “to applaud the works of those who are increasingly taking on these challenges, and perhaps to provoke additional designers to consider this end-user audience in their future designs” (Smith, C 2007, p.8).

The exhibition is in this sense a work of advocacy: Smith hopes that the exhibition will alert both designers and the public to the numbers of people living in poverty, and “the multitude of ways any of us can take action” (2007, p.17). This advocacy through objects is both towards attracting attention to the problems of the developing world, and to frame small-scale

designed objects as a means of addressing them. It also aims to give both designers and the first world public a sense of agency: ‘any of us can take action’ through designing such solutions or through supporting them. *TEDGlobal’s* highly-produced presentations, with William Kamkwamba’s as a prime example, similarly work as elements of a similar narrative along a few key themes, “triumph over adversity being the TEDster’s favourite” (Cadwalladr 2009, p.20). Playing on these narratives yields support for projects: after an “impossibly emotional” presentation in 2009 by a former Sudanese child soldier “hardened CEOs break down and weep; a TED lunch half an hour later immediately votes to give him €10,000” (ibid).

Curators, practitioners, conference organizers and the press seem to want to alert people to the problems of the developing world and to the possibility of solving them, through the display of innovative objects intended to address these problems. By selecting and presenting objects as symbolic and storytelling, institutions and the press, as well as the public, might, this thesis will argue, advance objects which are particularly effective in this way over less ‘communicative’ objects, or over objects which suggest different types of narrative. BOGO objects, such as IKEA’s *SUNNAN* lamps, are a clear example of how products for developing world use would propagate there through appealing to first world consumers. Communicating well to first-world audiences, or conforming to certain types of narratives, may be a desirable function for a design for development object – and the main focus of this thesis, the *PlayPump*, is an example of just such an object.

2.2.4 ‘A revolution in design’

The current high visibility of contemporary design for development, along with its claims of high impact on large-scale problems and its use for advocacy, contributes to its characterisation by practitioners and curators as ‘a revolution in design’, as development entrepreneur Paul Polak refers to it, quoted at the head of this chapter and below:

Ninety-five percent of the world’s designers focus all of their efforts on developing products and services exclusively for the richest ten percent of the world’s customers. Nothing less than a revolution in design is needed to reach the other ninety percent (2007, p.18).

The exhibition *Design for the Other 90%* is titled after Polak’s statement. The Cooper-Hewitt’s curator, Barbara Bloemink, presented *Design for the Other 90%* as an introduction to the work of designers “actively designing for the “other ninety percent” of the world’s population, rather

than for traditionally wealthy consumers living largely in the industrialized world” (2007, p.8). This is a shift in the attention of designers, she writes, away from “a culture with disposable income... seeking fulfillment of *desires* rather than genuine *needs*” towards “the suffering of those lacking even the basic necessities” (Bloemink 2007, p.6). Perhaps drawing on this influential exhibition, Red Button Design, creators of the *ROSS*, write on their website that they too aspire to produce “products which address real human needs and not just human desire” (Red Button Design n.d.). Dud Muurmund, writing for *INDEX:*, states that the competition “is not considered a traditional design event” as it only focuses on “design that considerably improves the lives for [sic] a vast number of people anywhere in the world” (Muurmand 2006). His implication is that *INDEX:* too is breaking with the mainstream of ‘traditional’ design in rewarding designers who address urgent, global issues, not minority interests.

The ‘revolution in design’ Polak and Bloemink refer to is identified by *Design for the Other 90%* curator Cynthia Smith as already underway, a “groundswell” of work by a variety of people – engineers, designers, entrepreneurs – interested in shifting their attention to the basic needs of the poor, “a quickly emerging design area” (2007, p.12). It is, she writes, “a movement” (2007, p.11) growing within the design professions and in design education, quoting design professor Leslie Spears who believes we are in the midst of “a paradigm shift... in how design is currently being discussed and practiced” (Smith, C 2007, p.12). CEO of *INDEX:* Kigge Hvid too, sees their focus on humanitarian issues in design as part of a collective movement in response to a contemporary sense of global priorities for design, a “tidal shift felt by so many today” (Hvid n.d.). She identifies her organization with “a widening field of designers and manufacturers turn[ing] their inspiration, skills and industrial capabilities to issues of improving life – both in the developed world and in still-emerging societies” (Hvid n.d.).

These are two claims made for design for development as a ‘revolution’ in design: as a break with the mainstream practice of design; and as a new direction for design that is attracting increasing numbers of practitioners. As well as the public and institutional visibility of this field increasing, so, it is claimed, is its practice. This gives us further reason to look carefully at this field, and to ask how far it fulfils its promise to change the practice of design, to address ‘needs over desires’. The claims made for the impact of this approach to addressing basic problems of poverty in the developing world are high, as detailed earlier. We will be in a better position to evaluate how far current work in design for development is a revolutionary break with the mainstream of design after further work in this thesis, especially through the deep analysis of the *PlayPump* in Chapters 7 and 8.

2.3 The *PlayPump*

The *PlayPump* is an example of a celebrated contemporary design for development object that exhibits the characteristics described for the field more generally: it has had a very high public profile, it claims wide-ranging impact, and it offers compelling images to first world audiences. It appeared in Architecture for Humanity's book *Design like you Give a Damn* in 2006 along with other design for development projects noted in this chapter, and it was nominated for the 2007 National Design Award in the US, presented by the Cooper-Hewitt Museum, in the same year the Cooper-Hewitt exhibited *Design for the Other 90%*. First Lady Laura Bush explicitly connected the *PlayPump* to the work on *Design for the Other 90%* in her opening speech to the Award, referring to the *Lifestraw* and the *Q-drum* along with the *PlayPump* as examples of "the difference sustainable designs can make" (Bush 2007). It combines attributes from across the range of design for development objects described in this chapter: it is a relatively simple manually-operated pump with a novel angle – it is driven by children's play – that is manufactured in the developing world; but it incorporates advertising to pay for its maintenance, and is supported by sales of consumer items in the first world.

The *PlayPump* is a water pump mechanically powered by the rotation of a children's playground roundabout, which pumps water to an elevated water tank, bearing advertising billboards (see fig 2.6 on the next page). The income from renting its billboards for commercial and public service advertising is intended to pay for the maintenance of the *PlayPump*. First installed in South Africa in 1994, the project started to receive international attention after it won the World Bank Development Marketplace Award in 2000. Global press coverage and funding for the project increased especially after 2006, when the project received the backing of the Case Foundation in the United States, who set up the organisation PlayPumps International to campaign on its behalf. It has received "extensive coverage in the international media" (Erasmus 2008). The *PlayPump* is examined in this section more or less on the terms by which it has been represented by its producers and through the press, to capture how it appeared to first world audiences over most of the project's history.

The *PlayPump* is made by Roundabout Outdoor, an outdoor advertising company set up by former advertising executive Trevor Field to produce the *PlayPump*. Field licensed the patent for the system from the engineer who invented it, Ronnie Stuiver, in 1992. Field had seen the pump as a working 1-10 scale model in an agricultural show in Pretoria, South Africa in 1989, and thought it was "a really cute idea" (Eastman 2008).



Fig 2.6: The *PlayPump*, by PlayPumps International, from their publicity.

Stuiver's original motivation for the project came from his experience installing boreholes in rural areas, where children would gather around him to watch his machinery at work. He wanted to make something that could combine the practical act of pumping water with recreation for local children. "I saw it and said, "Sell it to me"", Trevor Field recounts. "He [Stuiver] was going to sell it because it was five times the cost of a hand pump, and he couldn't make it profitable on its own" (Architecture for Humanity 2006, p.282).

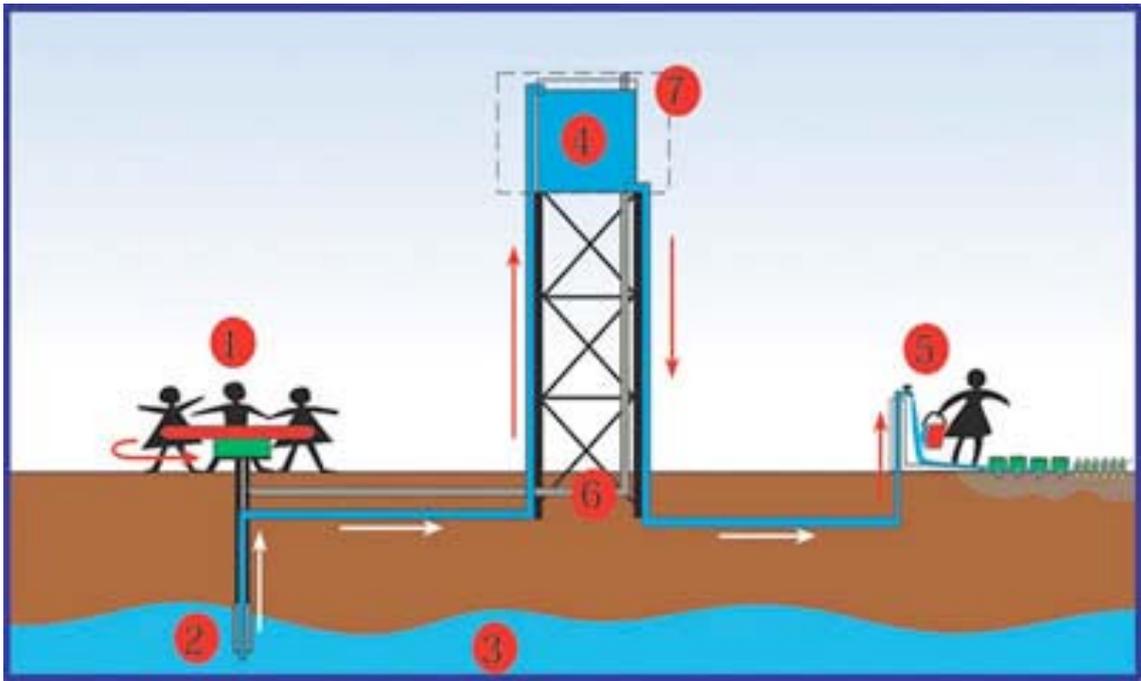


Fig 2.7: A diagram describes the workings of the *PlayPump* on the PlayPumps International website (2008)

Field's plan to generate funds to pay for the pump and its maintenance was to use billboard advertising, to be mounted on the elevated water tank he also added to the design. "Where everyone else saw a merry-go-round that pumped water", Field "saw advertising billboards that pumped water" (PlayPumps International 2009a). Field worked with Stuiver to redesign the pumping mechanism, so that the roundabout could spin in either direction to pump water, and added the water tank (ibid). He brought in two high-level advertising executive colleagues to help establish the project, one of whom was formerly managing director of Clear Channel Independent, "the South African operation of the world's largest outdoor advertising company" (Prospero n.d.). In 1993 they installed the first version of the pump in Masinga district in Kwazulu-Natal, a rural area of South Africa, "in conjunction with the local water authority, Umgeni Water" (le Roux 2003).

Two of the four billboards on the *PlayPump* are intended for non-commercial or 'public service' messages: anti-HIV/AIDS messages, for example, produced by the South African

organization *loveLife*, or messages promoting hand-washing for children produced by the South African Department of Health. The other two billboards are rented to corporations such as Unilever, an early partner to the project, to advertise products like Sunlight Soap and Colgate toothpaste. Management of the billboard advertising is run by Roundabout Outdoor, who also undertake the maintenance of the pumps, using funds generated by billboard rental fees, from which they earn a profit. Users can call or SMS a telephone number on the pump to notify the company when the pump is out of order.

It was the inclusion of messages addressing the HIV/AIDS crisis in South Africa that led to Roundabout Outdoor winning its first major award, the World Bank Marketplace Award in 2000, for providing both clean water and working against HIV/AIDS – that and the attention of former South African president, and global celebrity, Nelson Mandela, who attended the opening ceremony of a school with a *PlayPump* in late 1999 (William Davidson Institute 2007). Mandela “took a spin on one. The press photos captured the imagination of donors and investors” (March 2009) and “drew media attention to the PlayPump project” (Erasmus 2008). Field described it as “a turning point for the PlayPump” (William Davidson Institute 2007). They entered and won the World Bank Marketplace Award soon afterwards and the “associated exposure” that followed allowed the company to expand. “When that story hit the newspapers, Roundabout Outdoor picked up speed” (PlayPumps International 2009a).

In late 2003 Field set up Roundabout PlayPumps as a non-profit organisation independent from Roundabout Outdoor, in response to increasing international donations to the project, and to a change in tax legislation in South Africa. This allowed the project to receive charitable donations while Roundabout Outdoor remained a for-profit company (Melman & Morris 2010). Roundabout PlayPumps paid Roundabout Outdoor to make and install the *PlayPump*. The model for funding the *PlayPump* was to use money raised by Roundabout PlayPumps from individual donors, private investment, international agencies and government departments to pay Roundabout Outdoor for the pump and its installation, who would then manage the advertising revenue from the billboards to pay for maintenance, “guaranteeing sustainability” for ten to fifteen years (PlayPumps International 2009a).

In 2005, the US charity the Case Foundation, set up by former head of American Online (AOL) Steve Case and his wife Jean Case, became interested in the *PlayPump*, and in 2006 partnered with Field and Roundabout Outdoor to promote the project. They established the organisation PlayPumps International, based in the US, which became the public face for the *PlayPump*. Roundabout PlayPumps was renamed PlayPumps International Africa, and took on the role of channelling payments between PlayPumps International (US) and Roundabout

Outdoor, as well as managing some installations itself. The website that PlayPumps International established, at www.playpumps.org, became a major portal for fund-raising for the *PlayPump* from individuals and organisations in the first world. The same year the organisation was established, the Case Foundation partnered with USAID and the President's Emergency Plan for AIDS Relief (PEPFAR) to present PlayPumps International with a grant for US\$16.4 million, intended as the first instalment in a commitment to raise US\$60 million to install "4000 PlayPump® water systems in schools and communities in 10 countries in Sub-Saharan Africa", to provide water to 10 million people by 2010 (Case Foundation n.d.; PlayPumps International 2009b).

The *PlayPump* has also since 2005 been funded through the UK bottled water company *One Water*, established by entrepreneur Duncan Goose through his company Global Ethics. Profits from sales of their bottled water, which sells in Tesco's in the U.K. for the same price as Evian bottled water, go to the *PlayPump*. With their slogan "When You Drink One, Africa Drinks Too" (One Water 2009), they employ a BOGO-like promotional model. *One Water*, like PlayPumps International, conducts a high-visibility campaign for their product, including celebrity spokespeople and extensive marketing and advertising.



Fig 2.8: Some of the bottles in the *One Water* range, from their publicity.

PlayPumps International and Roundabout Outdoor set out a range of claims for the performance and impact of the *PlayPump*. Their claims for the benefits of the *PlayPump* result from its three main attributes: 1) the provision of clean water; 2) the provision of play equipment; and (3) the display of HIV/AIDS messages. From these three attributes they claim a range of results. "With a *PlayPump* system in place, children can spend more time in school

instead of fetching water over great distances, says the organisation, and women can spend more time with their families or take on income-generating activities” (Erasmus 2008). They also propose to decrease children’s time off school through helping to prevent “water-related illnesses that keep children out of school and compromise their ability to learn when they do attend” (PlayPumps International n.d.), as well as drawing more girls to schools, who “miss out on 25 percent of their education because of lack of water and sanitation at schools, which leads many girls to stay at home when they are menstruating” (Architecture for Humanity 2006, p.282). Their focus on gender equality is also attached to children’s play on the roundabout, which “engages boys with water collection” and facilitates play, “a powerful tool through which young people learn about themselves, gain respect for each other, break down gender stereotypes, and stimulate their bodies and minds. PlayPump systems inspire kids to play, giving joy while fostering self-confidence and interpersonal skills” (PlayPumps International n.d.). The pumps help to “reduce the impact of HIV/AIDS”, both through the messages on their billboards, and through providing people with HIV/AIDS, who have special needs for hygiene and taking medicines, with clean water and sanitation (PlayPumps International n.d.).

Some ‘vital statistics’ for the *PlayPump*’s performance, as described by PlayPumps International, follow. “At a rate of 16 revolutions per minute, the pump is able to move 1,400 litres of water [per hour] from a depth of 40m, says the manufacturer, and can operate at up to 100m” (Erasmus 2008). In 1996, the *PlayPump* cost sponsors US\$8,500 for equipment and installation (Architecture for Humanity 2006); in 2009, it cost US\$14,000 (PlayPumps International 2009b). Field says they are made to last 15-20 years before needing to be replaced (William Davidson Institute 2007). They are installed with a “minimum guarantee” of 10 years of maintenance (NextBillion.net 2007). According to information on the Playpumps International website, the company installed 700 pumps in South Africa between 1997 and 2005. In 2010, there are over 1,700 *PlayPumps* installed in Sub-Saharan Africa (Roundabout Water Solutions 2010).

There have been a range of figures circulated for the size of communities the *PlayPump* can supply with water. The Case Foundation claimed that 10 million people would be supplied by the 4,000 pumps planned for their major rollout, which makes for 2,500 people per pump. Other figures for the number of people that can be served by the pump also appear. The website *Soul Beat Africa*, for example, crediting emails from Field and other representatives of PlayPumps International as the source, writes that “the organisers estimate that each PlayPump® water pumping system installed directly benefits approximately 500 rural families,

each consisting of (a conservative estimate of) 5 family members... This equates to about 2000 people whose lives may be improved by each PlayPump installation donated” (Soul Beat Africa 2006). Here their maths is faulty: $500 \times 5 = 2,500$ people, not 2,000. But their statement also implies that if 5 family members is a conservative estimate, then the total numbers could well be higher: 6 people per family would be 3,000 people in total.

Coca-Cola in a report on their partnership with Roundabout Outdoor in South Africa claims that each *PlayPump* “will supply water to 4,000 to 5,000 people”, meaning that thanks to their sponsorship of 50 *PlayPumps*, “at least 200,000 rural-dwellers will have a steady stream of water in their communities” (Coca-Cola c. 2000). On the World Bank’s webpage for the Development Marketplace Award it gave the *PlayPump*, they write that through the installation of 40 pumps, “an estimated 200,000 rural community members are expected to benefit from the program through increased access to clean, safe water; recreational opportunities for children; and HIV/AIDS prevention education” (The World Bank 2004). This works out to 5,000 people per pump.

While Coca-Cola states unequivocally that their figures reflect water supply, phrases such as “benefits from”, used both by the World Bank and by *Soul Beat Africa*, along with “lives may be improved” are ambiguous: what benefit or improvement exactly? We might assume that the provision of water, the ostensible primary purpose of the pump, is the benefit. But if HIV/AIDS prevention education is included, these figures (especially the World Bank’s) could be the result of extrapolating to groups beyond immediate contact with the *PlayPump*, or who do not receive water from the pump. We could say that there is some uncertainty as to what these figures mean, and what they refer to – they imply that somewhere between 2,000 and 3,000, perhaps up to 4,000 or 5,000 people’s water needs can be met by the pump.

Ascertaining Roundabout Outdoor’s claims around these figures is clarified by one source, in 2003, in *Engineering News* magazine online: “Field estimates that the pumps, on average, supply water to between 2 500 and 3 000 people in every community in which they are installed, and that the advertising messages displayed on the storage tanks are read by about 5 000 people, including those passing through the area” (le Roux 2003).

2.4 Discussion

The discussion here will focus on the characteristics of the *PlayPump* also identified in the wider field of design for development: its visibility in the first world; its claims of high impact; and the way it communicates as image to first world audiences. It is discussed under these

three headings below. In what ways it helps to interrogate the claim that design for development is a break with mainstream design – ‘a revolution in design’ – will be discussed in the conclusion to the thesis in Chapter 9, after reanalysing the *PlayPump* in greater depth through Chapters 7 and 8.

2.4.1 High visibility

The *PlayPump* between 2006 and 2010 became a contemporary design for development icon, with a high level of international public visibility. As well as appearing in numerous articles in the South African press, the *PlayPump*, as noted in the online South African publication *Media Club South Africa*, has received “extensive coverage in the international media” (Erasmus 2008). A small sample of this coverage includes *Time* magazine, with an article written by former US President Bill Clinton, who called the *PlayPump* a “wonderful innovation” (Clinton 2006); an appearance in an editorial in the *The New York Times* (*The New York Times* (editorial) 2003); articles in *The Sunday Times* newspaper (UK) (Lamb 2005); and *BBC News* (BBC News 2005). *National Geographic* made a short film about the *PlayPump* as part of their ‘Wild Chronicles’ series (National Geographic 2008). So did *BBC2*, titled ‘A Low Tech Solution’ (BBC 2 2009).

A particularly influential piece of reportage on the *PlayPump* was a short film by PBS’s Frontline/World, which was broadcast online and on public television in the USA. The movie was made by reporter Amy Costello for PBS, and features Field visiting the site of an early *PlayPump* installation at a school (Costello 2005b). The film received a huge response from the public over a number of years, from its original screening in 2005, to an update in 2007 in response to the Case Foundation award, and beyond. The public response to this short film is described in more detail later in this discussion. Costello reports that her film was instrumental in advancing the *PlayPump* project, with Jean Case telling her that it was the first thing she would show potential donors to the project (Costello 2010b).

These reports on the *PlayPump* in the mainstream press are all positive, celebratory, and consistently repeat the information about the *PlayPump* presented by PlayPumps International and Roundabout Outdoor. The *PlayPump* was also celebrated in design forums, including Architecture for Humanity’s book *Design Like You Give a Damn* (2006), and in a 2006 commercial (Masters and Savant 2009) for the international conference Design Indaba, held annually in South Africa. And the numerous awards the *PlayPump* has received have increased its visibility: from their first award for US\$165,000 from the World Bank in 2000, through an ‘Investing in the Future’ award from the South African *Mail & Guardian* newspaper in 2003,

to their major and most influential award for US\$16.4 million from the Case Foundation, PEPFAR and USAID in 2006.



Fig 2.9: Presentation of US\$16.4 million to PlayPumps International, in 2006

The *PlayPump's* profile has been raised through the large number of partners they have been associated with. High-level institutions they have worked with and been funded by include state and private institutions: “Department of Water Affairs & Forestry, South Africa... the World Bank, the Kaiser Family Foundation, The Case Foundation, the Netherlands Development Finance Company (FMO), The ONE Foundation, the United States Agency for International Development (USAID), the United States President's Emergency Plan for AIDS Relief (PEPFAR) and the MCJ Foundation” (Soul Beat Africa 2006) as well as “Nelson Mandela Children’s Fund... Unicef (the United Nations Children’s Fund) and MTN, the mobile phone company” (Lamb 2005). Funding from private bodies has helped to attract support from state bodies, and vice versa. Field credits support from the World Bank Development Marketplace for “paving the way to forging a mutually-beneficial partnership with the public sector” (World Bank 2004). The Henry J. Kaiser Family Foundation gave Roundabout Outdoor US\$250,000 to install 60 *Playpumps* in South Africa, “contingent upon raising matching funds through the South African Department of Water Affairs and Forestry, which agreed to offer its support, bringing the total number of Playpump stations installed to 120” (World Bank 2004). The *PlayPump* also enjoyed support from private investors: by 2004, Roundabout Outdoor had already attracted ZAR25 million (approx. €2.5 million at the time) from the private sector, according to Field (Bloom 2004).



PlayPumps
INTERNATIONAL





Thank you for making a difference
100 Pumps in 100 Days

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Take Action

Do More

Think MTV's Water For Life: The United Nations, MTV and rap artist Jay-Z team up to raise awareness of the world water crisis. The site features The Diary of Jay-Z: Water for Life, in which he visits a PlayPump™ water system in South Africa and includes ways that you can be part of the solution to the world's water crisis.

Download our Volunteer Toolkit: Learn how you, your congregation, school or other group can support PlayPumps International with our free volunteer toolkit.

Join your support with the United Nations, who declared **March 22 World Water Day**. The Water for Life Decade 2005-2015 will give a high profile to implementing water-related programs and the participation of women.

Take the H2O Challenge. Test yourself and take the challenge presented by Water for People and The H2O Project. Drink only water for two weeks and contribute the

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- ◆ [PlayPumps International Challenges Amateur Filmmakers Worldwide to Film](#)

What people are saying

.water [has]

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roundabout in action

the playpump

[Children's roundabout solves the water problem in remote areas.](#)

In remote areas the chore of fetching water usually falls to the women or children. A common sight in rural South Africa is that of water carriers covering large distances in order to fulfill their daily water requirements.

Traditional sources of water collection are from dams, springs, rivers, streams and farm reservoirs, with the introduction of boreholes where these traditional sources of water are unavailable. Until now such boreholes have been operated by handpumps as the use of modern alternatives such as diesel, petrol or electric pumps are costly to install and have the concomitant constant financial burden of fuel and maintenance costs.

[A new patented South African invention simplifies the whole, exercise - the Play-Pump.](#)

Cartwheeling on a roundabout has always been fun for children. Now pure, clean borehole water can be pumped into water storage tanks while the playground roundabout equipment is in use. The Play-Pump is a specifically designed and patented playground roundabout that drives conventional borehole pumps, keeping costs and maintenance to an absolute minimum, while entertaining the children.

Fig 2.10: Websites for PlayPumps International (top) and Roundabout Outdoor (bottom) in 2008

Representatives of state have spoken publicly on their behalf, endorsing the project: most notably Laura Bush, US First Lady at that time, flanked by former president Bill Clinton and Steve and Jean Case in their major award to the *PlayPump* in 2006 (see fig 2.9, p.35). In South Africa in 2003, then Minister of Water Affairs and Forestry Ronnie Kasrils referred in parliament to “these magical ‘playpumps’” which his department had assisted in funding (Bloom 2004, p.20), and “Minister Buyelwa Sonjica [of the Department of Water Affairs and Forestry] has been vocal in her support and encouragement for the continued installation of this system in rural Africa” (Roundabout Outdoor n.d.). As Field said, the project has “the backing of some very, very powerful people” (Costello 2005b).

Institutions such as the Kaiser Family Foundation and the Case Foundation have helped to increase the visibility of the *PlayPump* through the media and online. The Kaiser Family Foundation note on their website that they have “direct partnerships with major media companies and a comprehensive “multi-platform” communications strategy”, with partners including “MTV, BET, Univision, Viacom/CBS, and Fox. Together, Kaiser’s campaigns reach tens of millions of people annually” (Henry J. Kaiser Family Foundation n.d.). The Case Foundation stipulated that the *PlayPump* acquire a new website when they joined the project, and employed “Net strategist Garth Moore to help it go global and craft an “everyman” approach to raising new dollars” (McMillan 2008). He transformed the *PlayPump*’s web presence, from the simple content-carrying Roundabout Outdoor website, to a new PlayPumps International site with features for social networking and direct donations on the site (see fig 2.10, previous page). Using the website in this way helped them to “unearth a new stream of donor dollars”, creating “a robust hub for fundraising”, which allowed their early ‘100 pumps in a 100 days’ campaign to raise US\$1.6 million online (ibid).

The PlayPumps International campaign was amongst the first to take advantage of new online fundraising features (ibid). It demonstrates the project’s successful targeting of individuals in the first world for support for the *PlayPump*. There are abundant examples of individuals in the United States and Europe, inspired by what they’ve seen of the project on the PlayPumps International website and in the press, independently organising fundraising events for the *PlayPump* in their communities, using features such as the ‘toolkit’ for volunteers visible in the screenshot of www.playpumps.org in fig 2.10. A typical message on the website for Costello’s Frontline film reads: “We are a concerned group of community members in Mt. Shasta, CA. We would like to do a fundraiser where the money would go directly towards a play pump for a village in Africa. Do you have a DVD that you can send about your projects to show our community? And do you have handouts we can give during the event?” (Costello 2005a).

MSNBC documents children undertaking fundraising drives for the project: “Kate Grabowski’s 4th grade class in Glastonbury, Connecticut learned about the kid-powered PlayPumps and made it their mission to sponsor a pump for South African school children in November 2006... The excitement spread and schools from California and Iowa got on board to contribute money toward a PlayPump” (Payne 2007).

The *PlayPump*’s tie-in with *One Water* is another route to individuals in the first world, exposing the *PlayPump* to consumers who buy *One* bottled water; and the *PlayPump* benefits too from the press coverage and prestige *One Water* receives. *One* was the official bottled-water of *Live8* and *Make Poverty History* in 2008, associating the *PlayPump* with high-profile campaigns for aid to the developing world. *One Water*, in return, receives a share of the attention given to the *PlayPump*, in a mutually beneficial relationship. Other high-profile campaigns which have increased the *PlayPump*’s visibility in the first world have included hip-hop artist Jay-Z’s ‘Water for Life’ concert tour in 2008, which pledged to raise US\$400,000 for PlayPumps International (Costello 2005b).



Fig 2.11: Jay-Z’s ‘Water for Life’ concert tour, which raised money for PlayPumps International

Lastly, an unconventional site for public exposure to the *PlayPump* in the first world: amusement parks. *The Sunday Times* reported that the Crealy Great Adventure Park, an amusement park in Devon, England, installed a *PlayPump* in 2006 for children to play on (Lamb 2005). “The tremendous benefits of installing Roundabout PlayPumps... are being harnessed by some of the world’s top Attractions,” wrote the managing director of Crealy, Angela Wright. “The response has been amazing - with visiting children and families so thrilled with such a simple solution to the challenge of clean water!” (Crealy Country Resorts n.d.-b). Wright, “a member of the International Association of Amusement Parks and Attractions, wants to install the roundabouts at 200 top attractions in Britain” (Lamb 2005). Another site for the installation of *PlayPumps* in the first world has been Heathrow Airport, where one was used as a fund-raising prop by *One Water* in 2009.

2.4.2 Claims of high impact

Claims for the impact of the *PlayPump* tend to use the hyperbole of the *New York Times* review of *Design for the Other 90%*, noted earlier in this chapter: like the headline to that article, Roundabout Outdoor state unequivocally that their “Children’s roundabout solves the water problem in remote areas” (Roundabout Outdoor n.d.). Similarly ambitious claims are repeated through the press – a South African online magazine article claims that the *PlayPump* and *The Hippo Water Roller* (another design for development object) are two South African inventions that “have largely alleviated this problem [lack of access to water] by combining simple designs with practical solutions” (Erasmus 2008) (my emphasis). Asserting in 2003 their intention of delivering water to ‘all of South Africa’ by 2008 was a large claim, and so was claiming in 2009 that they would reach 10 million people in the next year (PlayPumps International 2009a).

Other coverage of the *PlayPump* continues the theme we have noted earlier in the wider design for development arena: the notion that small, simple measures can have large-scale impact. “Simple idea, far-reaching effects”, reads one news article on the *PlayPump* (Erasmus 2008); “Sometimes it’s the simplest of ideas that can change the world most profoundly” narrates the *National Geographic* movie on the *PlayPump* (National Geographic 2008). And, “I’m really beginning to believe that we can change the world,” Field told *The Sunday Times* (Lamb 2005). Additionally, PlayPumps International claims that the *PlayPump* is “more cost-effective than other manual systems” (Soul Beat Africa 2006). *The New York Times* editorial in 2003 states that they are “more efficient, easier to use and cheaper to run than wells with hand pumps” (The New York Times (editorial) 2003). Of their pumping rate of 1,400 litres per minute at 40m, Roundabout Outdoor says “a typical hand pump installation cannot compete with this delivery rate, even with substantial effort” (Roundabout Outdoor n.d.). They claim that “there is never a shortage of ‘volunteers’” for playing on the roundabout (Roundabout Outdoor n.d.).

We can note that the source of the *PlayPump*’s claims is uncertain. In the description of the *PlayPump* earlier, we noted the degree of variance in its claims for how many people it can supply. In a discussion of the *PlayPump* in 2007 in which representatives of PlayPumps International were taking part, on the social enterprise website Nextbillion.net, a Rob Katz asked “I’m curious as to how PlayPumps monitors the effectiveness and longevity of their installations. Do you have a source for that type of data?” (NextBillion.net 2007). An employee of PlayPumps International, ‘Kathleen’, responded that they were “working with a university to design a comprehensive monitoring and evaluation system to quantitatively

measure the impact of a PlayPump system [on] a community. We are looking forward to sharing the results with donors and other interested groups” (NextBillion.net 2007).

Kathleen’s response implies that such quantitative evaluation had not until that point been undertaken: they did not, in 2007, have a source for the data, but hoped to soon. I have been unable to locate this research, and a request to Roundabout Outdoor for clarification of how their figures were reached was unanswered (Field 2009).

In describing the *PlayPump* in Section 2.3 earlier we noted the range of benefits for users claimed for the system. From the basic benefit of supplying water, of supplying play equipment, and of supplying HIV/AIDS messages, a range of ‘knock-on’ effects were extrapolated. Taking just the supply of water: by supplying water, children are saved the labour of fetching water, and so attend school more. Sick days at school are reduced because they have clean water; menstruating girls can attend school because they have access to sanitation; gender imbalances in access to education are so reduced (and because girls often have the responsibility for fetching water); mothers and wives will have more time for other activities than fetching water, allowing them to earn more income; and so on. Mark Melman for Roundabout Outdoor noted that with the system they are “setting up an infrastructure for a governmental communication tool. The Government Communication and Information System is using our space to advertise the government’s lesser-known projects” (Bloom 2004, p.20). Roundabout Outdoor says: “With the Play-Pump we can make children happy, reduce the workload for women, make a visible step forward in rural water development, and slow down the spread of HIV/AIDS” (Roundabout Outdoor n.d.).

These multiple functions of the *PlayPump* are useful in attracting funding. The first major funding the PlayPump received, from the World Bank, was awarded to them because of the inclusion of anti-HIV/AIDS messages via their partnership with loveLife. The Kaiser Family Foundation funding for 60 *PlayPumps* was awarded for the same reason. It also receives funding for water provision, from the South African Forestry Department for example. It is possible that it could receive funding that is targeted at play. Having more than one function expands the range of funding and award opportunities for the *PlayPump*.

As Field says, in his first encounter with Ronnie Stuiver’s model he immediately perceived the dual function of the *PlayPump*, for play and water – and later it became clear that this wasn’t just “killing two birds... with one stone” but more like “six birds” (Eastman 2008). Field described the PlayPump to me as a ‘medium’ which has yet to reach its full potential (Field 2009). Fig 2.12 on the next page is a table that tracks the supposed effects of the *PlayPump*.

1. pump water	Immediate to the object
2. entertain children	
3. carry messages	
i) communicate public	
service messages eg.	
Govt programmes,	
HIV/AIDs prevention	
ii) advertise goods	
iii) fund maintenance	

4. decrease time getting water	Local, extrapolated
5. increase access to education	
6. increase gender equality	
7. increase income-generating	
activities	
8. increase food growing	
9. increase health eg. Slow spread	
of HIV/AIDs, increase	
sanitation	
10. increase 'happiness'	

11. fund-raising tool	Removed, distant
12. market goods (One Water)	
13. market goods (advertising)	
14. amusement park ride	

Fig 2.12 The range of impacts and functions claimed for the *PlayPump*

We can note that these benefits claimed for the *PlayPump* are not contingent on *the way in which* water is supplied – the same logic could be used to claim this range of benefits from any way of reliably supplying water. These benefits rely only on the fact that water is supplied locally, in sufficient quantities. This method for extrapolating benefits from the general task that an object performs, rather than for the specific technical configuration of the object, has a close relationship to the other technique noted earlier in this chapter: the association of the scale of the problem with the potential impact of a specific solution, creating the impression that the solution operates at the scale of the problem.

2.4.3 Representations of the *PlayPump*

The *PlayPump* communicates to distant audiences through a range of forums: through the press, through awards, books, through campaigns and company websites, through social networks – and through bottles of *One Water*. Thinking like Field, who had a vision of ‘billboards that pump water’, we could almost imagine the *One Water* bottles as tiny water-dispensing billboards that are distributed widely around the first world. In addition to this, whenever *One Water* is advertised, so is the *PlayPump*. We have already noted this as a way in which design for development objects communicate to a first world audience, for Ikea’s SUNNAN lamps for example – through copies of themselves, or through other associated objects, marketed to consumers in the first world.



Fig 2.13: *One Water* bottle label, featuring an image of the *PlayPump* and text describing it.

This section of the discussion looks at the ways in which the *PlayPump* is represented to audiences in the first world, building on the observations in the first half of this chapter around the use of design for development objects as tools for advocacy, and carriers of narrative: their ‘symbolic and communicative aspects’. These representations are grouped under four headings below: the ‘positive narratives’ the *PlayPump* promotes; its attraction as a novel ‘innovation’; as a literalisation of ‘child’s play’; and as ‘the magic roundabout’.

2.4.3.1 Positive narratives

Reading responses from the public on online notice boards shows how effectively the *PlayPump*’s message of joyful work, simple solutions and positive narratives captures the attention of the public. The hundreds of comments on the FRONTLINE/World short film on the *PlayPump* are a good example, especially considering how influential this movie has been in the advancement of the project. FRONTLINE describes “an overwhelming interest from Web viewers” to the project (Costello 2005a). All of the following comments are from

FRONTLINE's webpage for the film. An anonymous poster writes, for example: "Thank you for sharing such a positive solution to a serious world problem... I encourage you to cover more solutions like this, to demonstrate that many of the world's problems only lack political will and a "we are all one" viewpoint"; others comment "this is a happy story ending" and "points for a positive story; not often enough to be had". A teacher writes "I've been sharing the excitement of the Play Pump in my third grade classroom for several years now... The global message of caring and providing a basic need for those who have so little is so valuable for my students to absorb. And the universal appeal of playground equipment is something they can easily relate to". "This play pump idea is brilliant" reads another post, "Does my heart good to know that basic human problems can still be solved with innovative and creative solutions". People describe getting "chills" and "goose-bumps" from watching the video; they describe it as a "heartbreaking and uplifting piece all in one". "I LOVE the idea! It is creative, inventive, and kind-hearted. I ADORE IT!". "This is the coolest thing I have ever encountered" (Costello 2005a). This characteristic of the *PlayPump* conforms to the emphasis on positive narratives that appear in forums like *TED*, and that *One Water* aims for in its campaigns for the *PlayPump*: "we rarely talk about the problems in Africa. We'd rather focus on the solution and create good feelings. Make a change in the world and have fun at the same time" ('Mark' 2010).

2.4.3.2 An innovative object

A children's roundabout as the source of mechanical energy makes the *PlayPump* novel; one of the most frequent words used to describe the *PlayPump* is 'innovative'. This quality is useful for attracting attention to the *PlayPump*. In describing the *Mail & Guardian* newspaper's *Investing in the Future* award, which was won by the *PlayPump* in 2003, the newspaper writes that "instinctively, the judges have always recognised the unusual and innovative in deciding the awards" (Groenewald & Wolmarans 2006). This gives a distinct advantage to the *PlayPump*, which is undoubtedly new and unusual, and which won "a special award for Innovation" as a result (Eskom 2004). Eskom, the South African state electricity supplier who shared the award with the *PlayPump*, describes it as an "innovative way of introducing sustainable, inventive technology" (Eskom 2004). To be 'inventive' and 'innovative' is expressed as much a criteria for success as to be 'sustainable'. The World Bank's Development Marketplace Award was for "innovative solutions to development problems" (Bloom 2004, p.20), and they referred to the *PlayPump* as "one of the world's most innovative designs" (Soul Beat Africa 2006). Novelty has value in attracting attention and support in this arena.

2.4.3.3 ‘Child’s play’

The *PlayPump* also operates as a narrative image. The configuration of the *PlayPump* tells a story or implies a narrative: mainly that work can be accomplished ‘effortlessly’ through play. This story is encapsulated in the *PlayPump* object, because of how it is designed to work, but also told through images, videos, and in textual descriptions of the project. As it reads on the World Bank Development Marketplace website, “primary school children can now be found laughing, playing, running, and joyfully extracting water from the ground for their entire community” (The World Bank 2004).

The narrative the *PlayPump* presents, of children’s play producing a vital resource without apparent effort, has an immediately-graspable symbolic power which is picked up by press reports on the project: “Why pumping water is child’s play” is a headline on the *BBC News* website (BBC News 2005); “Playing for real” is a headline in the *Mail&Guardian* newspaper, South Africa (Bloom 2004); *The Sunday Times* described the *PlayPump* as “turning the arduous task of pumping from a well into child’s play” (Lamb 2005). The *PlayPump* is an English language idiom – ‘child’s play’ – brought to life. It literalises an existing figure of speech; one which Western audiences are primed for.

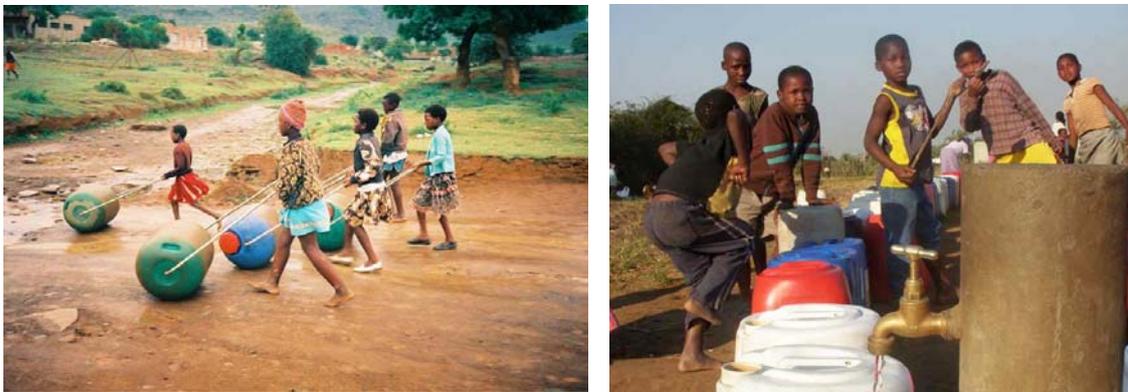


Fig 2.14. “Collecting water can be fun!” (left); “The waiting time for water without the Hippo Water Roller” (right) both from the *Hippo Water Roller Project* website (2009).

Requiring children to be a part of the system makes the project compelling. As Field says, “There’s nothing quite like children’s power as a pure energy source” (World Bank 2004). We can read pure as in a ‘clean’ energy source, but also pure in a more metaphorical sense: children are icons of innocence, not bearing the same assumed responsibilities as adults. This must be one of the reasons why they are used so frequently in development campaigns: they present an uncomplicated image of humans in need. Publicity photographs for the *Hippo Water Roller*, for example, a water-carrier similar to the *Q-Drum* but which has reached mass-

production in South Africa, work in a similar way to images of the *PlayPump* (see Figure 2.14, previous page). “Collecting water can be fun!” is the caption to the image on the left. Unlike the *PlayPump*, the *Hippo Water Roller* is not specifically designed for children. Designing the *PlayPump* to be operated by children means it is always represented with children included.

The *PlayPump* as ‘fun’, and as entertainment for both the user and an audience is underscored by its presence in amusement parks in the first world. Visitors to Crealy Great Adventure Park, as noted earlier, are “thrilled” by the *PlayPumps* (Crealy Country Resorts n.d.-b). The *PlayPump*, removed from its developing world context and its function to provide an essential resource for the user, becomes an amusement park ride, a thrilling spectacle for a first world audience.

2.4.3.4 ‘The magic roundabout’

The *PlayPump* is often referred to as a magical object. When minister Ronnie Kasrils endorsed the *PlayPumps* in parliament in 2003, he referred to “these magical ‘playpumps’” (Bloom 2004, p.20). Crealy Adventure Parks in describing their promotion of the *PlayPump* say that they “provide magic every day now children in our Attractions are spreading that magic to other children worldwide who are, in turn, sharing that magic with their communities” (Crealy Country Resorts n.d.-a). *The Sunday Times* referred to the *PlayPump* as “The drought-busting magic roundabout” (Lamb 2005). That this term has attained some currency is demonstrated by a news article from Surrey, England, reporting on a local fund-raising drive for the *PlayPump*, noting that the *PlayPump* is “known as the magic roundabout” (Get Surrey 2006).

The *PlayPump* is most likely perceived of as ‘magical’ because it promotes itself as accomplishing work without human labour. The innovation of the *PlayPump* is to have the work of water pumping accomplished as a byproduct of children’s play. The design of the system, with the pumping mechanism hidden inside the roundabout, creates the ‘illusion’ of roundabout and pump operating independently. Coca-Cola during their partnership with Roundabout Outdoor described the *PlayPump* as “a children’s roundabout with a hidden agenda to provide energy for a borehole pump” (Coca-Cola c. 2000). The construction of the *PlayPumps* International slogan “Kids Play. Water Pumps!” as two separate sentences emphasizes the *separation* of these two concurrent activities, implying that there is almost no causal relationship between the two phenomena. The project is even described as performing “modern-day alchemy, converting the energy of children cavorting on a simple playground merry-go-round into clean water” (Everline 2007).

The *PlayPump* takes its place amongst other magical objects in the European folk-story tradition that produce goods without work: salt-grinders, cooking pots, axes and harps. Walt Disney portrayed a version of the German fairy-tale ‘The Magician’s Apprentice’ in *Fantasia* (1940), with Mickey Mouse as the apprentice unable to keep control of a magical broom. As with the figure of speech ‘child’s play’, a model for ‘magical’ labour-saving objects such as the *PlayPump* already exists in the European tradition – and more widely: “All productive activities” of the Trobriand islanders, for example, noted the anthropologist Alfred Gell “are measured against the magic-standard, the possibility that the same product might be produced effortlessly” (1992, p.224).

2.5 Late developments

In September 2009, late in the research for this thesis, the first cracks appeared in the *PlayPump*’s till then impeccable façade, when the recently appointed CEO of PlayPumps International (US), Gary Edson, published a letter on the PlayPumps International website, after 100 days in office. In the letter, he admitted to problems in the rollout of *PlayPumps* under the massive programme they had launched in 2006, and announced that they were suspending the programme until further notice.

In November 2009, the first critical press report about the *PlayPump* was published, in the Guardian newspaper: journalist and former aid worker Andrew Chambers questioned the *PlayPump*’s claims, referring to criticism of the project by aid agencies, most significantly a letter from the head of WaterAid, which had been issued the previous month, in October 2009, as a position statement explaining why the organisation did not support *PlayPumps*: too expensive, not filling a particular technological gap, and with children’s play unlikely to be a reliable source of energy. In the same month as Chamber’s article, a worker with Engineers without Borders (Canada), began blogging about his first-hand observations of *PlayPumps* in the field in Malawi, criticising them based on his observations of them in the field, and through interviews with users.

Chamber’s article made reference too to another source of information from the field: an unpublished, critical report by UNICEF on *PlayPumps* in Malawi and Zambia; though this had been produced in 2007, its release had apparently been suppressed on the request of PlayPumps International and/or Roundabout Outdoor (Melman & Morris 2010). In March 2010, PlayPumps International took down their website, and handed over all remaining *PlayPump* stock to another organisation, Water for People (Costello 2010c). And finally, in July 2010, Frontline screened a follow-up to their 2005 report on the *PlayPump*, titled ‘Troubled

Water’; responding to the responsibility she felt in having helped advance the *PlayPump* with her earlier report, Amy Costello followed up on the emerging criticism of the *PlayPump* project. That program made reference to an also unpublished study of *PlayPumps* in Mozambique commissioned by the Mozambiquan government in 2008, which made substantial criticisms of the project.

While these events saw the disappearance of PlayPumps International, and a dent in the credibility of the project, Roundabout Outdoor continues to seek funding for more *PlayPumps*, and in 2010 launched a new website to facilitate donations, at www.playpumps.co.za. *One Water* continues with its campaigns for the *PlayPump*, with considerable support from the first world public. “One is pretty much installing a PlayPump every three days”, they posted on their campaign’s Facebook page in March 2010 (One 2010a). The discussion of the *PlayPump* in this chapter focuses on the height of its popularity, identifying its characteristics as a design for development icon. Its recent fall from grace is examined in detail, calling on the recently available sources of evidence documented above, when reanalysing the *PlayPump* in Chapters 7 and 8.

2.6 Summary

This chapter established ‘design for development’ as a highly visible contemporary field, through examining examples of its presence in a number of forums. Selected characteristics of this field were identified. As well as being highly visible, this chapter noted that claims of high impact on large-scale social problems are made for these small-scale, object-based interventions, and they are frequently presented as symbolic of the problems of the developing world – and the ability of designers and entrepreneurs to devise creative ways of solving them. Curators and practitioners within design for development tend to identify themselves as breaking with the concerns of mainstream design, presenting themselves as part of a broader movement which is growing in numbers: a ‘revolution in design’.

The *PlayPump* was proposed as an example of a celebrated design for development object that bears out the characteristics of the wider arena: it too has a very high public profile, it makes wide ranging claims for its impact, and it provides a compelling image for first world audiences: as a creator of positive narratives; as an innovative object; as an embodiment of ‘child’s play’, and as the ‘magic roundabout’, through which work can be achieved without labour. The history of the *PlayPump*, the specific claims for it made by its producers and supporters, and its ability to engage audiences and mobilise support for itself was established.

The *PlayPump* is the central study in this thesis. It is re-analysed in depth in Chapters 7 and 8: Reanalysing the *PlayPump* 1 & 2, using perspectives generated in the intervening chapters of the thesis. It is used to reflect on design for development in the conclusion to the thesis in Chapter 9. The next chapter, Chapter 3: Fluid technology, examines an example of an appropriate technology for water provision that operates in the same general region as the *PlayPump*. The following chapters, Chapter 4: Art intervenes, Chapter 5: Critical design and Chapter 6: Antiprograms examine examples of objects from a wide range of disciplinary and social contexts that, like the *PlayPump*, are intended to equip users while also demonstrating an ability to communicate in diverse and engaging ways with audiences.

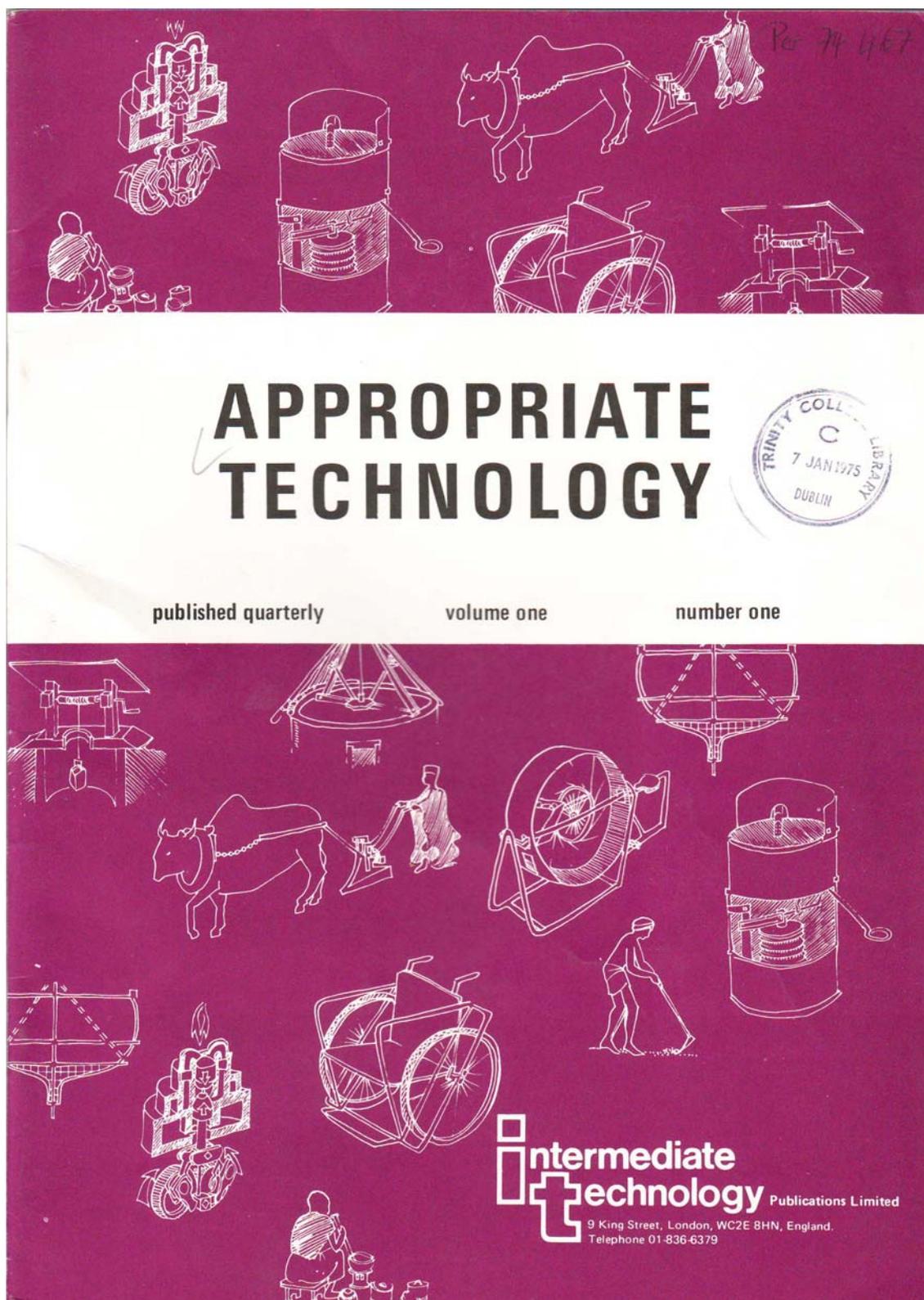


Fig 3.1: The cover of the first issue of *Appropriate Technology* magazine, published in early 1974.

Chapter 3

Fluid technology

...in travelling to intractable places, an object that isn't too rigorously bounded, that doesn't impose itself but tries to serve, that is adaptable, flexible and responsive - in short, a fluid object - may well prove to be stronger than one which is firm.

De Laet and Mol, 'The Zimbabwe Bush Pump: Mechanics of a Fluid Technology', *Social Studies of Science*, 2000, p.225

3.1 Introduction

This chapter notes the identification of contemporary 'design for development' with the 'appropriate technology' movement of the 1970s. Several contemporary design for development objects, including the *PlayPump*, are described as appropriate technologies by their makers and by curators and journalists. Contemporary design for development practitioners refer to the influence of the major figure in the appropriate technology movement – the economist E.F. Schumacher – on current practice.

The chapter outlines Schumacher's formulation of appropriate technology, and identifies the more critical views that characterised early design attention to the developing world. It traces some divergence between his original formulation and current design attention to the developing world. The variation within contemporary design for development noted in the previous chapter – from local low technology to global consumer products – is attributed to the combination of older conceptions of appropriate technology with more recent approaches. Some of these recent approaches have seen objects designed for the developing world acquire first world audiences, as documented in the previous chapter. It is suggested that the most visible contemporary design for development objects only make selective use of the original principles of appropriate technology.

In the second half of the chapter, an iconic and long-standing example of an appropriate technology, the Zimbabwe Bush Pump, is analysed. The Zimbabwe Bush Pump is a water pump that operates in the same general geographic region as the *PlayPump*. A paper by science, technology and society scholars Anne-Marie Mol and Marianne de Laet which sets

out an idiosyncratic perspective on appropriate technology, is consulted; in analysing the Zimbabwe Bush Pump, they mobilise the metaphor of ‘fluidity’ to examine what makes it ‘appropriate’. This analysis is used in Chapter 7 to reanalyse the *PlayPump*, checking its claims to be an appropriate technology.

3.2 Appropriate technology

Contemporary design for development objects are routinely referred to as examples of ‘appropriate technology’. The *PlayPump* is described by its makers and by others as an appropriate technology (EWB-SFP Appropriate Technology Design Team 2006; PlayPumps International 2008). When UNICEF undertook a study of the *PlayPump* in 2007 they titled their report “An Evaluation of the PlayPump® Water System as an Appropriate Technology for Water, Sanitation and Hygiene Programmes”, noting that since Roundabout Outdoor won the World Bank Development Marketplace award in 2000, “the PlayPump® has been promoted increasingly as an appropriate technology for water supply programmes in sub-Saharan Africa” (2007, p.5). The makers of the *ROSS* refer to their invention as an appropriate technology (Bowditch 2009), as do the producers of the *Hippo Water Roller* (The Hippo Water Roller Project n.d.). The *Lifestraw* is described as an appropriate technology by numerous sources (eg. Pachico 2009). But what is an ‘appropriate technology’? What is its relationship to design for development as described in the previous chapter? And how might we evaluate the claims of design for development objects – particularly the *PlayPump* – to be described as such?

3.2.1 ‘Small is Beautiful’

In her catalogue essay for *Design for the Other 90%* MIT professor Amy Smith (whose presentation at *TED* we referred to in the previous chapter) identifies the “appropriate technology movement” of the early 1970s as the first “revolution... in design for developing countries” (2007, p.30). This movement, she writes, was based on the economist E.F. Schumacher’s work, particularly his 1973 book *Small is Beautiful*, in which “he was one of the first people to rethink the context and scale of technology for development. He stressed the need for technologies that create jobs which use locally available materials and match the human resources necessary for the technology to function” (2007, p.31). *Design for the Other 90%* curator Cynthia Smith refers too to Schumacher’s “influential book of essays entitled *Small is Beautiful*... [that] called for production from local resources for local needs – the basic

idea for appropriate technologies to which many of the designers in *Design for the Other 90%* adhere” (Smith, C 2007, p.13).

Small is Beautiful, subtitled *A Study of Economics as if People Mattered* is, as described in the introduction to the 1993 edition, “a collection of essays and speeches written and given over a number of years, more or less cobbled together as a series of overlapping snapshots” (Schumacher 1993, p.vii). There are a number of key themes in the book. Schumacher was broadly critical of the ideas that he identified as dominating Western economic thought, demonstrating the criticality towards mainstream economics and business practice that characterised the early appropriate technology movement. “One of the most fateful errors of our age is the belief that ‘the problem of production’ has been solved,” he began, “...that mankind has at last come of age. For the rich countries, they say, the most important task now is ‘education for leisure’ and, for the poor countries, the ‘transfer of technology’” (Schumacher 1993, p.2).

Far from the problem of production having been solved, Schumacher identified in it a fundamental and fatal error: in not counting natural resources as expendable, as a form of capital that is being used up by industrial production, Western economies were not sustainable. There could be no “unlimited progress” given the limited natural resources of the planet (Schumacher 1993, p.4). *Small is Beautiful* is in part an early environmental treatise, identifying the finite nature of resources such as fossil fuels, and the harm human industry is doing to the planet. This association between designing for developing world conditions, and for lower environmental impact – both of which look to alternative energy sources, for example – continues today.

Schumacher was also concerned with the effect of modern industrial society on people. “Is it not evident that our current methods of production are already eating into the very substance of industrial man?” he asked (1993, p.8). While some people are materially better off in the rich countries, other effects of modern industry are destructive of human happiness and creativity, and especially the possibility of fulfilment through meaningful work. “Instead of working solely for their pay packet and hoping, usually forlornly, for enjoyment solely during their leisure time”, Schumacher proposed, “we can interest ourselves in the evolution of small-scale technology, relatively non-violent technology, ‘technology with a human face’, so that people have a chance to enjoy themselves while they are working... we can interest ourselves in new forms of partnership between management and men, even forms of common ownership” (Schumacher 1993, p.9). Schumacher’s motivations were towards a fundamental reimagining of production in the first as well as the developing world, and he identified the

need for the West to question its dominant economic assumptions, especially the idea of continual growth, consumption, and the obsession with Gross Domestic Product (GDP) as a measure of economic health, that still characterises Western economic thought.

Where *Small is Beautiful* engages particularly with the developing world, it is because of the issue of ‘technology transfer’ to ‘the poor countries’ that he identifies at the start of the book. Rather than perpetuating the economic and technological practices that dominate the first world through replicating them in the developing world, he identified an opportunity to develop different approaches which would be more sympathetic to the natural environment and to humans. It is in a chapter titled ‘Social and Economic Problems Calling for the Development of Intermediate Technology’, based on a paper delivered at a UNESCO conference in Chile in 1965, that Schumacher first refers to ‘The Need for an Appropriate Technology’ (1993, p.147). Implementing first world technologies, especially those of mass-production, in the developing world would fail to provide employment there, Schumacher wrote, which is what he saw as most needed in development. He advocated instead the development of an ‘Intermediate Technology’, which would be more productive than the original indigenous tools in a poor region, but less expensive and more humane than first world technology, and which would also provide for more employment. Such equipment should be produced “mainly from local materials and mainly for local use” (Schumacher 1993, p.145). It should be “fairly simple and therefore understandable, suitable for maintenance and repair on the spot”, making it “far less vulnerable to unforeseen difficulties” (Schumacher 1993, p.149).

His Intermediate Technology Design Group began publishing the journal *Appropriate Technology* in 1974 (see fig 3.1 at the start of this chapter). In Schumacher’s introduction to this first issue he continued his emphasis on the problem of unemployment in the developing world. “Unemployment in the developing countries”, reads his first sentence, “is a massive and growing problem. In Asia, Africa, Latin America and the Caribbean, village industries that had supported whole communities for centuries are disappearing – made redundant by urban mass production” (1974, p.1). The response of “the many hundreds of thousands of people engaged in the battle against world poverty, working for many hundreds of organisations”, Schumacher writes, is “to look for appropriate technologies, for the know-how and equipment designed to help the poor to help themselves” (ibid). The magazine published letters and articles by practitioners (it intended to be a forum that would connect disparate workers in the developing world) and plans for tools and technologies.

3.2.2 Critical attitudes

One of Schumacher's criticisms of the idea that first world industry should be established indiscriminately in the developing world, is that it would serve to increase, not decrease poverty: "highly ambitious five-year plans regularly show a greater volume of unemployment at the end of the five-year period than at the beginning" (Schumacher 1993, p.144). He was critical of the outcomes of mainstream development practice, as well as of Western economic practice in general.

Design attention to the developing world through the 1960s and 1970s was characterised by critical attitudes towards development and to first world economic practices. Though the title of the 1977 conference *Design for Need*, for example, called by the International Council of Societies of Industrial Design (ICSID), sounds superficially similar to Polak's and *Design for the Other 90%'s* proposal to design for needs rather than desires, the voices on the conference were much more critical of design's role and more sceptical about its ability to 'solve' the deep-seated problems of the developing world.

Design for Need was held at the Royal College of Art in London to address the issue of 'The Social Contribution of Design'. The designer Gui Bonsiepe was one of many speakers at the conference who criticized the economic and political underpinnings of the first world's relationship with the developing world. He was sceptical of the ability of markets and consumable objects to solve global inequality: in his address Bonsiepe identified the "heavy emphasis" first-world economies place on "individual consumption and privately owned artefacts", which makes them only "accept and register needs... when these needs can satisfied by objects in the form of merchandise, ie. products and services bought via a social institution called market and possessed by individual consumers" (Bonsiepe 1977, p.14).

In contrast to Polak, Bonsiepe does not call for the market to be extended to the poor, but instead for policies to make developing world countries autonomous from central economies, for 'self-based' development. This is a result of his understanding of the deprivation of the developing world as the "sad corollary of [the] development of central economies", which is perpetuated through systems of unequal exchange from the periphery to the centre (Bonsiepe 1977, p.13). He cites as an example that in the 1960s, "capital inflow [to the developing world] from central economies was roughly \$10,000 US per annum, whereas the average return was at least fifty per cent more. The dependent countries finance their increasing underdevelopment" (Bonsiepe 1977, p.13).

Nowhere in current texts on ‘design for development’, as framed in the previous chapter, have I found similar critiques of the causes of poverty in the developing world. Instead, only positive, forward-looking measures for addressing poverty are offered – these perhaps make for more palatable narrative elements in a field that looks to market institutions and venture capitalists for support. The ‘revolutions’ and ‘tidal shifts’ in design described by some contemporary institutions and practitioners may not be as foundational as they at first sound, and not in comparison to earlier work in this field.

3.2.3 Divergent trajectories

At the time Schumacher introduced the concept of intermediate technology, in 1965, he could write that while examples of intermediate technology “can be found in every developing country, and indeed in the advanced countries as well”, “they exist, as it were, outside the mainstream of official and public interest” (Schumacher 1993, p.155). From the evidence in the previous chapter, the visibility of objects designed for developing world use is today much higher, and much more mainstream. It does not appear to still be “a neglected field assigned to a small number of specialists, set apart” (Schumacher 1993).

Some current work in design for development seems to quite comprehensively carry out Schumacher’s intentions for intermediate and appropriate technology. Amy Smith’s work, for example, continues to engage with the issue of employment, alongside appropriate technology’s other concerns. The project she described at *TED* in 2005, for example, referred to in the previous chapter, was towards the development of simple, small-scale tools and processes for poor Haitians to produce charcoal briquettes from local waste material, for local use, where they have “trained nearly a hundred people in the manufacturing techniques” to do so, hoping to establish small local businesses (Smith, A 2007, p.30). Amy Smith as quoted earlier in this chapter (p.51) still identifies Schumacher’s concern with creating jobs as central to appropriate technology, and her projects reflect his environment concerns: her charcoal project in Haiti was intended to avert deforestation.

But current design attention to the developing world is, as noted in the previous chapter, diverse, from simple, mechanical objects that would not have been out of place in the first issues of *Appropriate Technology* magazine, to sophisticated, mass-produced consumer items such as Freeplay’s *FPR2* radio or the *OLPC*. While Amy Smith’s work could be seen as comprehensively carrying forward early work in appropriate technology, some of the most visible contemporary design for development objects are harder to square with the earlier ideas which inform the field.

While Cynthia Smith claims that many of the projects in *Design for the Other 90%* follow the basic principles of appropriate technology, one of the most prominent objects on the show, used on the cover of the catalogue and on posters for the exhibition, is the *LifeStraw*. The *LifeStraw* is, loosely speaking, ‘appropriate’ to the developing world in that lack of clean water is mainly a developing world problem. Its manufacturers Vestergard-Franken write that they are “designed for use in rural areas of developing nations; they do not require electricity, batteries or spare parts” (PR Newswire 2009). But the *LifeStraw* is a mass-produced object that is sold to aid agencies for global distribution in the developing world, and also to hikers, travellers and the military in the first world; it does not integrate Schumacher’s concern for providing means of employment in the developing world, it is not made locally, or from local materials, and is not maintainable by the user. Schumacher was, in fact, specifically critical of “the technology of mass production” as “inherently violent, ecologically damaging, self-defeating in terms of non-renewable resources, and stultifying for the human person” (1973, p.143).

Martin Fisher of the organisation KickStart (exhibited on *Design for the Other 90%*) which produces simple mechanical technologies such as manually-operated water pumps for sale to developing world users, is critical of Schumacher’s “romantic notion” that new tools and technologies could be made by “individual end users or by local artisans spread across the country-side” (Fisher 2007, p.35). He advocates instead a conventional supply chain of centralised mass-manufacture in “the most advanced factories available”, producing goods which wholesalers and middlemen move to market, while making a profit (Fisher 2007, p.37). As first-world users are not expected to “build our own automobiles, computers, lawn mowers, and cell-phones”, the idea of asking developing world people to make their own technologies is, Fisher writes, “fatally flawed” (ibid). Centralised mass-manufacture, he writes, makes products lower-cost and “ensures higher quality and reliability” (Fisher 2007, p.37). Schumacher, in contrast, asserts in *Small is Beautiful* that “a considerable number of design studies and costings, made for specific products in specific districts, have universally demonstrated that the products of an intelligently chosen intermediate technology could actually be cheaper than those of modern factories in the nearest big city” (Schumacher 1993, p.154).

We might expect approaches to designing for the developing world to have evolved and diverged in the decades since Schumacher first made his proposals. Indeed, Amy Smith, whose work appears to still carry out Schumacher’s original principles, identifies how theories in design attention to the developing world have evolved since his work. Though she

identifies Schumacher's formulation of appropriate technology as 'the first revolution' in design for the developing world, she identifies two subsequent revolutions in design for development that have influenced her own approach.

The second revolution Smith names is "participatory development" (Smith, A 2007, p.31). In earlier appropriate technology approaches, she writes, "technologies were developed that were appropriate to their surroundings, but they reflected what the designer felt were the issues or problems of a community, rather than reflecting the views of the community itself" (ibid). Participatory development looks to involve a community in "identifying the issues they face as well as the resources they have to address them" (ibid). Participatory development, Smith writes, makes for projects that are more responsive to the real needs of the community, and are better maintained once installed.

The third, and current (as of 2007) revolution is "the notion of co-creation", which Smith describes as "teaching the skills necessary to create the solution, rather than simply providing the solution" (ibid). As a result, the technology is made "transparent to the users" – they understand how it works and how it was developed (ibid). The aim of co-creation is both to have users contribute to the development of a particular project, and to have them "acquire the skills needed to create solutions to a much wider variety of problems" (ibid). This, Smith writes "leads to greater empowerment of the community, often in surprising ways" (ibid).

The trajectory of evolution in design for the developing world that Amy Smith identifies is towards greater involvement of developing world users in the design of projects. While she identifies the significance of seeking greater involvement of developing world users in design, Polak, whose work and writing inspired the exhibition *Design for the Other 90%*, claims in contrast that "the things they [the poor] need are so simple and obvious" that it is "relatively easy" for entrepreneurs and designers to come up with products for them (2007, p.19). While sharing Schumacher's concern to provide "income-generating technologies" to the poor in the developing world (Polak 2007, p.24), Polak identifies another trajectory for design attention to the developing world: that which regards the poor as customers, and seeks to motivate the Western entrepreneur to design for them out of self-interest. Polak writes that there is "money to be made" for designers who design "specifically for poor customers" (2007, p.19). The poor in the developing world are "a huge, unexploited market, which includes billions of poor customers" (Polak 2007, p.25). There is only one "truly sustainable engine for driving the process of designing cheap", Polak writes: "because that's where the money is" (ibid).

That the motivation for Western designers and entrepreneurs to design for the developing world should be to make money for themselves, and that this can be the engine for sustainability, seems quite different to Schumacher's advocacy of local self-reliance for the poor in the developing world. The businesses Schumacher and Amy Smith envisage establishing are local, benefiting developing world communities; the businesses others such as Polak advocate are global, and benefit those outside of poverty or the developing world. Trevor Field, of the *PlayPump*, works along a similar track to Polak. "You're looking at capitalist.com, make no mistake about it," Field told an audience at the University of Michigan in 2007. "If I can make money and do good at the same time, that's great. I'm a philanthropreneur" (William Davidson Institute 2007). The means of 'sustainability' for the *PlayPump* is to offer the rural poor as audiences for the advertising of consumer goods; again, this seems out of keeping with Schumacher's comprehensive critique of Western consumer society in *Small is Beautiful*.

3.2.4 Acquiring first world audiences

A means for making profit for producers of objects designed for developing world use, and so making for 'sustainability' in Polak's terms, is to market these objects to first-world consumers as well as developing-world users, as we have noted of the BOGO model followed by some products in the previous chapter. The *LifeStraw*, for example, is marketed as a hiking and camping product in the first-world, and to the military in Australia and New Zealand (Vestegaard Frandsen n.d.). The *PlayPump* is funded by sales of *One Water* to first-world consumers, and IKEA's *SUNNAN* lamp by sales of the product to first-world consumers. The *BayGen* windup radio, produced in 1996, the first in the "immensely successful" *Freeplay* series of wind-up radios (Lamb 2005), which were exhibited on the MoMA exhibition *SAFE* (as mentioned in the previous chapter) is an early example of this approach. The following text from the website for Innovative Technologies, a company owned by Trevor Baylis, the inventor of the *BayGen*, clearly illustrates the dual markets targeted by the *BayGen* radio. Under the heading 'Primary Users', it reads:

The radio was initially intended for people in developing countries where affordable energy is scarce or non-existent. Radios are often the only way these people, many of whom are illiterate, are able to keep abreast of current events. Preventative health care, refugee assistance programs, aid relief, distance learning and tracing of missing persons are only a few of the areas in which radio programming can assist. In developed countries, the radio not only

appeals to nature enthusiasts, boaters, cottagers, construction workers and those who live and work in remote areas, but to those whose consumer habits are governed by ethical, social and political concerns. For this reason, the radio is a perfect gift for those who support non profit organizations whose main focus is on international development particularly with regard to literacy programs. Additionally, the durability, power source and variety of frequencies make the Baygen radio an appropriate and ideal choice for disaster preparedness kits.

(Innovative Technologies 1996)

The succeeding models of wind-up radio produced by Freeplay were focused further on first world consumers. The journey from the *BayGen* radio to their later *FPR2* radio could be read as a narrative that encapsulates the transformation of ‘appropriate technology’ from a holistic concern with the means of production and context of use for an object, to a more limited set of concerns. The *BayGen* radio was, as the text above notes, originally designed for people in developing countries. It was, like the *PlayPump*, intended as a means to spread information about HIV/AIDS (Baylis’ original motivation for designing the radio). Made of tough black plastic, it contained no batteries, both to save the cost to the user and for environmental reasons, and was entirely powered instead by a clockwork mechanism driving a generator – Baylis’ original innovation. It was first manufactured in Cape Town, South Africa by disabled workers (Trevor Baylis Brands Plc n.d.), and by prisoners as part of a rehabilitation programme; former South African president Nelson Mandela noted of the latter that the project would “create jobs and provide opportunities for those who would otherwise be condemned to the margins of society” (Mandela 1998). Its means of production, was, as Schumacher thought it should be, integrated with social concerns.

The radio became so popular amongst first-world consumers, however, that they became the target market, and both the design of the radio and the way it was produced were changed. The second-generation model produced in 1997 was “smaller and lighter than the original model [and] designed especially for the Western consumer market” (Trevor Baylis Brands Plc n.d.). The *FPR2* (1998) substituted a transparent casing for the original black plastic, introduced a more elegant, asymmetrical form, and is powered by rechargeable batteries, which allows it to produce more power for less winding, but compromises on the original intentions of the battery-less *BayGen*. It is the *FPR2* radio that the NY MoMA chose for their design collection, rather than the *BayGen*, indicating its appeal to Western design institutions.

In 2001, the Freeplay Energy Group announced “an aggressive new corporate direction”, in which Freeplay would focus on “developing applications and commercial uses for its technology, and establishing partnerships with leading companies to manufacture, co-brand and distribute its products” (Freeplay Energy Group 2001). Manufacture of their products was handed over to Hong Kong-based Li & Fung, “one of the world's leading global supply chain management companies”, which operates “an international network of 7,000 manufacturers and produces goods worldwide [for] marketers such as The Walt Disney Company, Avon, Toys R Us and The Gap” (ibid). More recently, Freeplay reintroduced a model specifically for developing world-users with the *LifeLine* radio, which can only be bought by aid agencies for distribution in the developing world. In an article that appears to be circa 2009/2010, a journalist writes that “Freeplay Energy has sold over three million units since its beginnings, and over 150,000 of these have gone to countries in the developing world” – meaning only about 5% of their output since 1996 has gone to the developing world, according to this source (Hanlon c. 2009). The *BayGen* and subsequent *FPR2* radio were quite possibly groundbreaking in demonstrating how an object designed for developing world use could profit by appealing to first-world audiences.



Fig 3.2: The original *BayGen* radio (1996), left; and the *FPR2* radio (1998), right.

The most prominent or ‘highly visible’ design for development objects, such as those documented in the previous chapter, and which are a focus of this thesis, are the more recent, product-like objects. While often referred to as ‘appropriate technologies’, they only selectively carry out earlier ideas of what principles should inform designs for the developing world. Working on ways to facilitate greater involvement of developing world users in the design process, as described by Amy Smith, can be quite easily seen as an evolution of the ‘original’ intentions of earlier work in appropriate technology: to democratise technology production. There is more tension between these original intentions and the other more recent trajectory

identified, that towards seeing the developing world poor as customers, using profit for the producers of mass-produced objects as the means of their ‘sustainability’, and the simultaneous marketing and sale of products to first-world consumers. These more recent approaches have retained the idea of small-scale technologies, specifically designed for developing world-type conditions, but no longer prioritise the creation of employment for the poor in the developing world, or local production from local resources. They are instead mass-produced global consumer products. Describing these objects as ‘appropriate’ requires a more limited definition of appropriateness, one largely disconnected from its original, more critical ideological framework.

3.3 The Zimbabwe Bush Pump

The Zimbabwe Bush Pump is an example of a highly successful and long-standing appropriate technology: in 2010, there are about 45,000 Bush Pumps installed in Zimbabwe, as compared to about 1,700 *PlayPumps* in neighbouring countries (Morgan 2010; Roundabout Water Solutions 2010). There are more Zimbabwe Bush Pumps installed in other countries, particularly South Africa and Namibia: though the Zimbabwe Bush Pump is the national (state) handpump of Zimbabwe, it is unpatented, and can be produced by any manufacturer.

The *PlayPump* and the Zimbabwe Bush Pump operate in a very similar geographical area, though there are no *PlayPumps* installed in Zimbabwe – looking at a rough map of *PlayPump* installations in fig 3.3 on the next page, one can see that they surround Zimbabwe but do not enter it. The figures next to each country name indicate the number of *PlayPumps* installed there, according to Roundabout Outdoor. There definitely are *PlayPumps* in Zambia, as UNICEF’s report, referred to in Chapter 7, makes clear, but Roundabout Outdoor does not seem to acknowledge them: a personal communication from Mark Melman of Roundabout Outdoor in 2010 offered these figures, but did not reply to requests for figures for Zambia.

Field has expressed his interest in installing *PlayPumps* in Zimbabwe: “I can’t wait to get into Zimbabwe with my PlayPump system to help the people” he told one interviewer (Eastman 2008). The main reason Field gives for not entering Zimbabwe with the *PlayPump* is that Roundabout Outdoor insists on a customs duty exemption from all countries they install in (Greene & Stellman 2009). In Zimbabwe “the border guards want a 35% import duty on a gift. Well, not in my lifetime, we’re not going to do that” (Greene & Stellman 2009, p.172).



Fig 3.3 *PlayPumps* installed in southern Africa, using figures from Roundabout Outdoor, early 2010

The Zimbabwe Bush Pump makes a good subject of study for this chapter both because it is a water pump that expresses many of the attributes of an ‘original’ appropriate technology, operating in the same general area as the *PlayPump*, and because of the creative work that has already gone into analysing it, in a paper by science, technology and society scholars Ann Marie Mol and Marianne de Laet titled ‘The Zimbabwe Bush Pump – Mechanics of a Fluid Technology’, published in the journal *Social Studies of Science* in 2000.

De Laet and Mol produce the metaphor of ‘fluidity’ to express the qualities that make the pump a successful appropriate technology. The authors’ formulation of fluidity adds to this thesis’ understanding of the complex and multiple ways in which an object may function. The Zimbabwe Bush Pump is first described below, drawing mainly on de Laet and Mol’s text and a report on the Bush Pump by water and sanitation expert Karl Erpf for the Swiss Resource Centre and Consultancies for Development (SKAT), and then discussed in section 3.4 using de Laet and Mol’s concept of fluidity.

3.3.1 History

The Zimbabwe Bush Pump is a water pump with a long history in Zimbabwe. The first version of the pump was designed and made in 1933 by a British water manager, Tommy Murgatroyd, in what was then colonial Rhodesia, and since then has undergone successive redesigns. Its latest form, the Zimbabwe Bush Pump B-type, which is the focus of de Laet and Mol's paper, was designed by Zimbabwean Dr. Peter Morgan in 1987, and is still in production today under the management of the Zimbabwe government, as their 'national standard' hand-pump. The Zimbabwe Bush Pump is widely regarded as a successful example of an appropriate technology, "described many times before as a remarkable handpump" (Erpf 1998, p.2) and "an admirable water pumping device" (de Laet & Mol 2000, p.225) with "exceptional competence" (ibid, p.231). It is "the longest serving locally designed pump on the continent" (Morgan 2010).



Fig 3.4: The Zimbabwe Bush Pump; the right-hand photo is the later, standardised B-type pump.

Zimbabwe is the only African country, as far de Laet and Mol are aware, that produces its own pump. "Relief programmes, like UNICEF's 'Water for the Children'", write de Laet and Mol, "usually carry their own model" – which is why "one finds water-pumping devices strangely clustered on the world map: trucked all over the globe by relief organizations, pumps end up where these organizations happen to go - rather than near the sites where they are produced" (de Laet & Mol 2000, p.236). But when UNICEF partnered with the Zimbabwean government to improve the country's water infrastructure, they were discouraged from using their usual pump, and after buying their first ten B-types in 1987 for trials, UNICEF "rapidly converted to the Bush Pump" (de Laet & Mol 2000, p.236).

UNICEF even began to adopt the B-type “not only for use in Zimbabwe, but... to promote its use in other places as well. The pump is used widely in Namibia, and is being tried in South Africa and Swaziland” (de Laet & Mol 2000, p.259). The B-type is adaptable to a number of well-types, and can reach twice the depth of similar pumps (de Laet & Mol 2000). By 1998, some 33,200 Bush Pumps had been installed in Zimbabwe, 18,000 of them the B-type pump produced since 1987 (Erpf 1998). Interviewed in 2010, Morgan says there are now about 45,000 Bush Pumps installed in Zimbabwe. But despite “amazing reports of success and excellent records in the water policy of Zimbabwe” (Erpf 1998, p.1), the Zimbabwe Bush Pump, unlike the *PlayPump*, “is almost unknown internationally” (Erpf 1998, p.2), and certainly largely unknown to the general public in the first world. It does not have a significant profile in the international mainstream press.

Murgatroyd’s 1933 pump was designed for “simplicity, durability, and ease of maintenance” (de Laet & Mol 2000, p.228). It is a hand pump: the user raises and lowers a long handle to draw water from an underground natural source to the surface. The B-type Bush Pump operates in a similar way, and its workings will be examined in more detail later in this section. At the time of Murgatroyd’s original design, welding was unknown, and so his pump was made from standard plates and pipes bolted together (Erpf 1998). As a result the pump has a “clumsy” appearance, writes Erpf, but is very strong, “overdesigned in terms of material strength” in relation to modern pump designs (Erpf 1998, p.2). This material strength made it possible for some of these early models to still be in operation at the time of Erpf’s and de Laet and Mol’s papers, after several decades of use (de Laet & Mol 2000; Erpf 1998).

The first changes to the Murgatroyd pump design were made in the mid-1960s by an engineer Cecil Anderson at the Ministry of Water in Rhodesia, who “replaced some of the bolted parts with components that were welded together” (Erpf 1998, p.2), and redesigned the headworks of the pump so that they could be removed from the concrete base – in Murgatroyd’s original pump design the headworks were permanently embedded in the concrete base (Morgan 2010). The pump was renamed the Bush Pump, and made the national standard hand pump for Rhodesia.

After independence in 1980, when Zimbabwe succeeded Rhodesia, the new state retained the Bush Pump as its national standard. Though ostensibly standardised, there were variations to Anderson’s 1960s model (or A-type Bush Pump) produced by different government departments and by non-governmental organisations (NGOs). In 1987 the Zimbabwe government sought to “modernise and standardise a new National Standard Handpump,” which would retain the successful features of the earlier models (Erpf 1998, p.3).

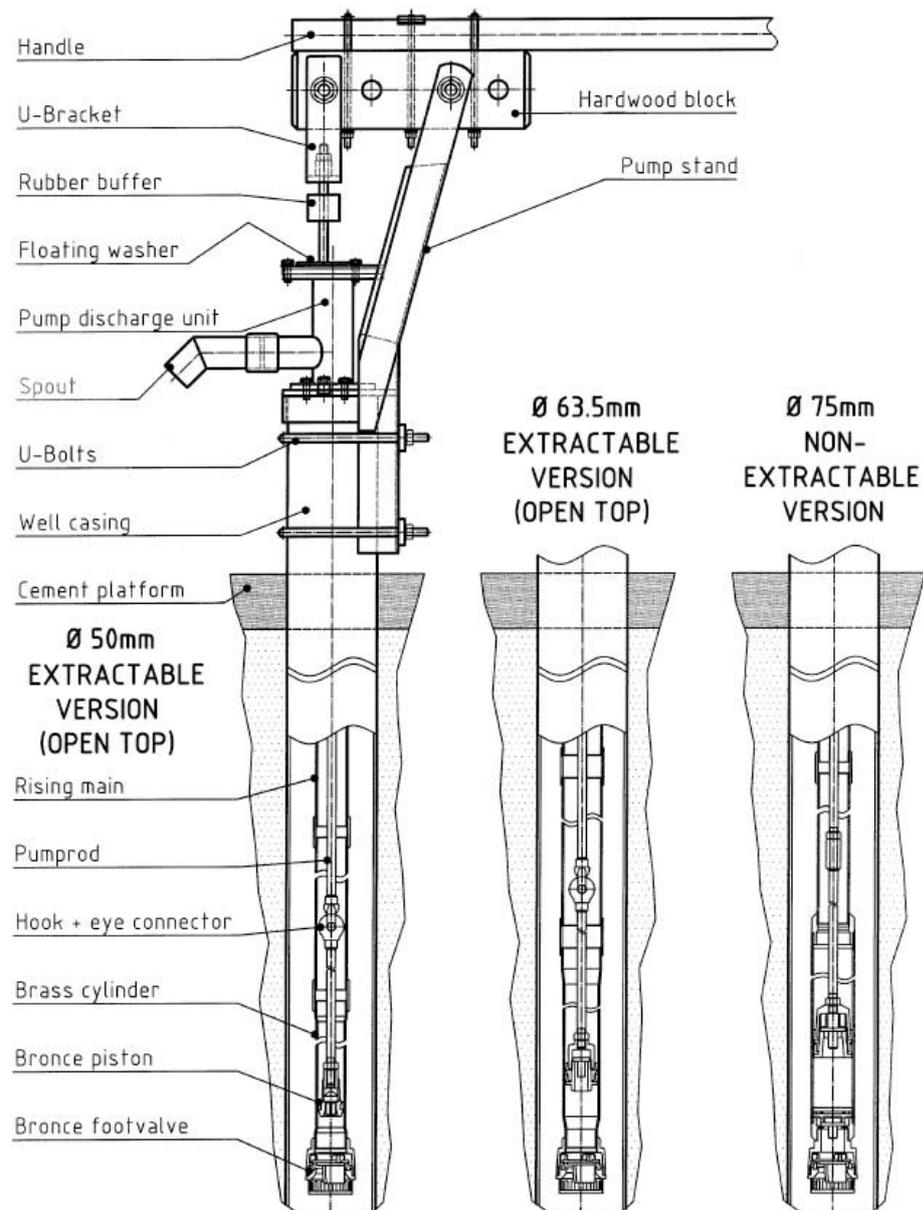
“Maintenance was a significant factor in this decision” to standardise the pump, write de Laet and Mol, quoting Morgan: “Without maintenance the pumps can fail and remain out of order for months. It is therefore the maintenance program, rather than the pump itself which determines whether a handpump program will be successful in the long term, assuming, of course, that technical faults in the pump itself have been reduced as far as possible” (de Laet & Mol 2000, p.245). This new ‘B-type’ Bush Pump, designed mainly by Morgan working for the government, “went through two years of heavy duty endurance testing” before it was accepted as the new standard (ibid). About 18,000 of these B-type Bush Pumps were manufactured in Zimbabwe between 1987 and 1998. In 1998, these co-existed with many other pumps of the Bush Pump lineage still in operation within Zimbabwe, including 9,000 A-type pumps, and 6,500 of various types including the Murgatroyd (less than a 100) and others (Erpf 1998).

The Bush Pump has what Erpf describes as “an excellent potential for local manufacturing” and is “easy to manufacture in many developing countries,” presumably due to its simple construction and use of materials (1998, p.9 and 17). In 1998 the Bush Pump was produced by 12 different companies in Zimbabwe, who together produced sufficient B-type pumps to install about 3,000 a year in Zimbabwe (Erpf 1998, p.9). V&W Engineering, run by Victor von Elling, which made approximately 60% of the total numbers of B-type pumps at that time, is the main company featured in de Laet and Mol’s inquiry.

3.3.2 Mechanics

Fig. 3.5 on the following page is a diagram of the B-type Bush Pump, from Erpf’s report. We will pay attention first to the aboveground workings of the pump (the ‘head gear’) in the top-half of the diagram. The pump is a “conventional lever action handpump” (Erpf 1998, p.8). The user moves one end of the handle up and down, which draws the pumprod up and down inside the rising main (below ground), drawing water up the rising main through a simple valve system. Water discharges from the spout. The pump’s head gear is attached to the well-casing, which is embedded in a concrete apron (‘cement platform’ in the diagram). The head gear is designed in such a way that user-maintenance of the above-ground parts of the pump is possible: “the open arrangement of the head gear allows local adaptations of the pump head” (Erpf 1998, p.22). Both de Laet and Mol and Erpf report that head gear in which parts have broken, sometimes replaced with make-shift arrangements by users, still work.

Diagram of Pump Types



5

Fig 3.5: Diagram of the Zimbabwe Bush Pump, from Erpf's report. 'Bronze' is an error, it should read 'brass'.

Morgan reports seeing pumps that worked well entirely without some of their parts, and in other cases with parts replaced by the user with other objects – reinforcing bar substituted for bolts, for example (de Laet & Mol 2000). In Erpf's short inspection of pumps on location in Zimbabwe he notes many pumps with faults such as parts worn or missing, but which still worked well. For example, a particular B-type pump was “heavy to use, some parts not matching, faulty U-bracket plates, no spring washers, no lock nut on U-bracket, short side-plates on pump stand, 40mm pipe handle (should be 50mm)... however the pump was working with a good discharge” (Erpf 1998, p.21). He describes it as a “typical feature of the Bush Pump... that it is able to deliver water even when badly worn or when parts are missing” (Erpf 1998, p.22).

The head-works of the B-type pump are painted blue at the factory. De Laet and Mol write that this is designed to make the pump “attractive and appealing”:

Its cobalt colour suggests purity, clarity and freshness, the qualities sought for the water that it delivers. And its clean hard lines and compact shape ask you to ‘pick me up and install me wherever you fancy. I am cool and easy to use’. This message is not frivolous fantasy on our part. The pump is meant to convey messages of this kind. The pump’s manufacturer in Harare, V&W Engineering, has found that the tools it makes are most likely to be used if they are brightly coloured: ‘We like to paint our products brightly, make them attractive. They work better that way’ (de Laet & Mol 2000, p.228).

3.3.3 Maintenance

Observing the below-ground components of the pump, design work has also been undertaken here to make the pump more “user-friendly” and maintainable (Erpf 1998, p.16). Fig 3.5 on the previous page depicts three variations in the below-ground workings of the B-type pump. The pump is manufactured in three sizes: 50mm, 63.5mm and 75mm diameter. The larger diameter pumps produce the greater volume of water per time spent pumping, but the smaller diameter pumps are potentially easier to install, use and maintain. As well as this variation in size, the diagram depicts two different designs: the ‘extractable version’ (shown here in 50mm and 63.5mm sizes) and the ‘non-extractable version’ (here the 75mm size). The extractable or ‘open-top’ versions of the B-type pump are later versions designed so that users can draw the inner workings of the pump to the surface for repair and maintenance without the use of special lifting equipment.

Erpf writes that the majority of the Bush Pumps, which are not open-top, “are not user-friendly” despite many attempts “to encourage the users to participate more fully in [their] maintenance. This did not succeed because of difficult repairs and heavy tools” (1998, p.4). With the non-extractable pumps, which form the vast majority of the Bush Pumps manufactured, the valve mechanism unit (the ‘capsule’ or ‘down-hole components’) at the bottom of the pump shaft is wider than the rising main, meaning that the heavy galvanised iron rising main has to be lifted before the valve mechanism is accessible. This is necessary even for “the routine replacement of a piston seal, which is the most commonly undertaken maintenance procedure” (Erpf 1998, p.12).

While work on designing an open-top version of the Bush Pump began as early as 1985, of the 18,000 B-type Bush Pumps manufactured between 1987 and 1998, only about 1,000 of these are the 50mm and 63.5mm extractable models (Erpf 1998). The 75mm open top model went on the market in 1996 (Erpf 1998). The open-top design was still ongoing in 2000, at the time of publication of de Laet and Mol’s paper, which reports Morgan writing to them about design corrections and refinements (de Laet & Mol 2000, p.260). Morgan explained to me in 2010 that while there were about 1,000 of the open-top pumps produced, they “never really caught on”, mainly because there was not as large a support base for parts for them, being a new technology, as they were for the older and more wide-spread non open-topped versions (Morgan 2010). There are other pumps, such as the India Mk 2, the most widely used pump in the world, which have successfully carried forward this innovation (ibid).

The failure of the open-top version to ‘catch on’ with users seems then, according to Morgan, to be due in part to them not being ‘standard’ enough within Zimbabwe. As noted earlier, Morgan told de Laet and Mol that maintenance was a significant factor in the decision to standardise the Bush Pump – so while introducing the open-top versions of the pump was intended to advance their ease of maintenance, there was not enough of a system-wide change to support it. Morgan observed how the maintenance program is more significant than the pump itself (assuming basic technical flaws have been reduced) in determining the long-term success of the pump program (de Laet and Mol 2000). The maintainability of the Zimbabwe Bush Pump then lies not just in the pump mechanics, but in the system around it. To foreground the complexity of the maintenance system required for even a relatively simple and widespread appropriate technology such as the Zimbabwe Bush Pump, and for later comparison to the *PlayPump*, whose ‘sustainable’ maintenance program is a large part of its attraction to funders (this comparison is discussed further in Chapter 9: Conclusion) this system is described briefly below.

Zimbabwe's state water policy for overseeing water pump installation and maintenance at the time of Erpf's report was a three-tiered system. The first tier, closest to the pump, was a water point committee which is selected by the pump users, and which oversaw 'preventative maintenance' such as tightening bolts, greasing moving parts, cleaning the surrounding area, and reporting breakdowns (Erpf 1998). The second tier was an individual 'pump minder' at the 'ward' level who was a trained pump mechanic employed as casual staff, and whose function was to "repair broken pumps, keep records of all repairs done and to report monthly to the field officer" (Erpf 1998, p.11). The third tier was at the district level, where full-time employees of the DDF, equipped with heavy vehicles, undertook repairs that the ward level pump minder could not do.

3.3.4 Funding

According to Morgan, "most funding for the Bush Pump comes from donors" – NGOs and UNICEF – while the manufacture of pumps "is in the private sector" (Morgan 2011). Several companies have been involved, with V&W Engineering having made over 20,000 B-types (ibid). Part of the impetus for designing the open-top, more user-maintainable versions of the B-type pump – attempting to have users, rather than paid employees, undertake more maintenance duties – was the diminishing funds available for the maintenance of the Bush Pumps installed in Zimbabwe (Erpf 1998). Morgan writes, "Community assisted maintenance of this type is desirable as this reduces the burden on the DDF [District Development Fund]" (de Laet & Mol 2000, p.239). At the time of de Laet and Mol and Erpf's papers, Zimbabwe was at the start of an accelerating economic collapse. In 1998, the maintenance system for the pumps was in a state of transition; in light of falling maintenance budgets, the DDF started to promote Community Based Maintenance, with the assistance of UNICEF.

In 1998 the DDF's yearly budget for maintenance (transport, labour and spares) for 33,200 pumps was US\$1.1 million, an amount that Erpf describes as "quite inadequate" at approximately US\$30 per pump (1998, p.11). He nevertheless describes the DDF three tier system as "excellent", making the Bush Pump reliable. He warned that with the lack of funding for maintenance, with the "allocated amount per pump per year [dropping] dramatically", finding money for maintaining the infrastructure during the transition to Community Based Maintenance was crucial if a large number of pumps were not to go out of order (Erpf 1998, p.19).

Erpf writes that the cost of maintaining the open-top or 'user-friendly' pump "will be very low as long as the working parts are in good order" (Erpf 1998, p.16). Over 10 – 15 years the cost

in spare parts in 1997 would have been around US\$300 for the 50mm open-top B-type pump (ibid). Erpf notes that labour and transport costs, which are not included in this figure, could be “considerably higher than the cost of the materials” (ibid).

When I met Peter Morgan in Zimbabwe in 2010, he was testing a new version of the Bush Pump, the C-type. The Zimbabwean government, under pressure from outside agencies such as UNICEF, had asked him if he could reduce the material costs of the Bush Pump, as its price rose dramatically for a time due to the economic crisis in Zimbabwe (the cost reduced just as dramatically once foreign currency exchange rates were normalised in 2010). Morgan made some changes to the mechanism of the pump-head to reduce the bore of the piping required below-ground; the weight of steel piping used in the pump is a large part of its cost.

We can note that the approach of the Zimbabwe government and its partners to meeting the costs of the manufacture and maintenance program for the pumps focuses on reducing expenditure, by using less materials and by making maintenance by users more possible. We can compare this later in the thesis to the approach the *PlayPump*'s producers take, where their innovation is more to do with acquiring funding than reducing expenditure.

3.3.5 Installation

While Erpf writes that “the installation of the Bush Pump has to be done by experienced mechanics” from the DDF, NGOs, government departments and contractors working for the government (1998, p.10), de Laet and Mol in their slightly later paper focus on the involvement of users in pump installation. The cement platform identified in fig 3.5 on p.67, which de Laet and Mol refer to as the concrete headworks or apron, is “usually made by the future users of a new pump: a collective of villagers builds the headworks and installs the pump” (de Laet & Mol 2000, p.232). Building a sound apron around the pump is crucial for preventing surface water, which may be contaminated, from going down into the borehole and polluting the water supply (de Laet & Mol 2000). A detailed set of instructions are supplied with the pump describing how to build the concrete headworks, and where the borehole should be placed – “at a higher elevation, and at least 30 metres from latrines and cattle kraals”, for example (de Laet & Mol 2000, p.232).

Apart from these practical instructions on siting the borehole to ensure that it does not become contaminated, community representatives are consulted about where to place the pump. In rural Zimbabwe, the *nyanga*, or traditional healer, is of particular importance, “especially when doubling as local water diviner” (de Laet & Mol 2000, p.234). A UNICEF

worker explains that where wells are drilled “purely on the basis of geological survey... such wells do not always work” (ibid). Even though the well may produce abundant water, and is nearer than one it is replacing, if the *nyanga* was not consulted and village women do not want to use the well, “the well is dead” (ibid). This happens all too often, the worker reports, “when NGOs or governments are determined to keep the siting and boring of the well entirely in their own hands” (ibid). Morgan, and Von Elling of V&W Engineering make consulting local water diviners an explicit requirement in their instruction manuals for installing the pump. In Zimbabwe, Morgan and Von Elling write, “village level participation is actively encouraged in all water and sanitation schemes. It is now well established that without this participation, communities cannot generate the commitment for maintenance as they do when they are involved” (de Laet & Mol 2000, p.234).

FIGURE 3
Community Drilling a Borehole



Source: [Morgan, 51].

Fig 3.6: Image extracted from instructions in V&W’s manual for drilling a borehole (de Laet & Mol 2000, p.233)

Villagers are also involved in the drilling of the borehole. For this they are supplied with a tubewell drilling device. In Zimbabwe this is often a device called the ‘Vonder Rig’, after its inventor Von Elling, which is manufactured at V&W Engineering along with the Bush Pump. Like the head gear of the B-type pump, it is brightly coloured to invite interaction from users – this time in yellow – and is “hand-driven, portable [and] durable” (de Laet & Mol 2000, p.233). The fact that the rig is manually operated, rather than mechanically powered, facilitates community involvement, according to the factory that manufactures it (ibid). The rig is supplied with a video showing how “sometimes operating the rig turns into a village feast” (ibid). Village women are shown pushing an iron crossbar to drive the auger into the ground, “while village men sit on the bar to weigh it down and children dance around” (ibid). This is shown in illustration in fig 3.6 above.

3.3.6 Performance

A few of the vital statistics of the Zimbabwe Bush Pump B-type, which has been tested over time by various Zimbabwean government departments, associated academic and non-governmental bodies, and independently by the Consumer's Association's Research and Testing Centre in the UK in 1996, follow (Erpf 1998). At 40 metres depth (the depth for which we have a performance figure for the *PlayPump*) the B-type can pump between 550 litres of water an hour (for the smallest, 50mm bore) and 950 litres (for the largest, 75mm bore) at a depth of 40m. Erpf notes that these discharge figures are not absolute, being “influenced by many factors like the operator's physical strength, duration of pumping, etc” (1998, p.7). He includes the table below in his report, which assumes 75 Watt of input power. He also notes that while the table ends at 60m depth, “there are several Bush Pumps which work in the range of depth down to 100m” (1998, p.7).

Head	Ø50mm cylinder	Ø63.5mm cylinder	Ø75mm cylinder
10m	1.3	1.8	2.3
20m	0.9	1.3	1.7
30m	0.7	0.9	1.25
40m	0.55	0.75	0.95
50m	0.45	0.6	0.8
60m	0.4	0.55	0.7

Fig 3.6. Diagram of discharge rates (in 1,000s of litres, or m³) from Erpf's report (1998, p.7)

The pump can provide water for up to 250 people (de Laet & Mol 2000; Erpf 1998). It is meant to last 10 – 15 years before the majority of parts may have to be replaced, though as Erpf notes, “many Bush Pumps are known to last for many decades” (Erpf 1998, p.16). The cost of the 50mm open-top B-type pump in 1997, not including labour, transport, and other costs was in the order of US\$390, and the 63.5mm open-top B-type pump was close to US\$460 (Erpf 1998). In 2010, Morgan estimated the cost of a B-type Bush Pump at US\$1,200, including the above and below-ground hardware, for a 30m depth borehole – a major cost of a pump is in the steel piping lining the borehole, and so varies by depth and gauge (Morgan 2010). The installation cost is additional to this - as noted earlier in regard to maintenance, “labour and transport costs... can be considerably higher than the cost of materials” (Erpf 1998, p.16).

3.4 Discussion

In the abstract to their paper, de Laet and Mol write that they “investigate the intricacies” of the Zimbabwe Bush Pump B-type “so as to find out what makes it an ‘appropriate technology’” (2000, p.225). This, they write, “turns out to be what we call the ‘fluidity’ of the pump (of its boundaries, or of its working order, and of its maker)” (ibid). In this discussion, we will draw out de Laet and Mol’s exploration of fluidity as appropriateness. With their study of the Zimbabwe Bush Pump, they aspire to “add to the literature on appropriate water devices”, while acknowledging that their paper “by no means captures or covers this body of work” (ibid). They implicitly refer to appropriate technology-type settings with their “hope to contribute to an understanding of technology that may be of help in other contexts where artefacts and procedures are being developed for intractable settings which urgently need working tools” (de Laet & Mol 2000, p.226).

3.4.1 Fluidity

In analysing the Zimbabwe Bush Pump, de Laet and Mol “lay out the various ways in which this piece of technology, so advanced in its simplicity, is fluid in its nature” (de Laet & Mol 2000, p.225). While the pump itself is “solid and mechanical”, yet, they argue, “its boundaries are vague and moving, rather than being clear or fixed” (ibid). What they call the pump’s “working order” is also fluid: “the question as to whether or not the Bush Pump actually works, as technologies are supposed to, can only rarely be answered with a clear-cut ‘yes’ or ‘no’. Instead, there are many grades and shades of ‘working’; there are adaptations and variants” (ibid). And finally, the pump’s most recent maker, Dr. Peter Morgan, designer of the B-type pump, is fluid too, “dissolving into his surroundings. The one kind of activity which he firmly stands for is attending, being attuned, and adapting to what happens to the Bush Pump in the world-out-there” (de Laet & Mol 2000, p.226). These three rough categories within which de Laet and Mol identify the fluidity of the Zimbabwe Bush Pump are explored under the three headings below.

3.4.1.1 “...of its boundaries”

De Laet and Mol describe the boundaries of the Bush Pump as fluid in a number of ways. It is, first of all, fluid over time: as the Bush Pump’s design has changed, older models have not disappeared when newer ones came into being. Even some of the original Murgatroyd pumps made in 1933 were still operational at the end of the century, and may still be now. As Erpf

too describes, multiple versions of the Zimbabwe Bush Pump are in use simultaneously. The pump was still, at the time of their paper, undergoing continual reassessment and design. De Laet and Mol write that the B-type pump may already be slightly outdated by the time their text is read, though it will not have disappeared from the villages where it is installed (2000). At the time of their investigation, design work on the open-top versions of the pump was still underway. The pump is in this way not always the same, “not an immutable but a changeable object, that has altered over time and is under constant review” (de Laet & Mol 2000, p.228). This aspect of fluidity contributes to the appropriateness of the pump in, for one, showing its ability to adapt over time, and for another, demonstrating its durability.

So the Zimbabwe Bush Pump is a varied ‘family’ of pumps – Erpf refers to earlier Bush Pumps as the “relatives” of the B-type Bush Pump, with which it has “the same successful details in common” (Erpf 1998, p.8). But De Laet and Mol point out that the Zimbabwe Bush Pump is part of larger families too, of other water pumps. The Bush Pump, for example, could be separated from a “common alternative” in Zimbabwe, the Bucket Pump, in that the Bush Pump operates by using pistons, valves and levers, utilising hydraulic forces, while the Bucket Pump does not, having a much simpler mechanism (de Laet & Mol 2000, p.230). The Bucket Pump is only used in shallow wells, for up to 60 people, while the Bush Pump can be used in a range of well-types, and serve up to 250 people. But this “does not mean that it [the Bush Pump] is unique” – its use of hydraulic principles places the Bush Pump in a family of similar pumps, those with a ‘lever activated lift pump mechanism’ (ibid).

Here again we can describe the Bush Pump as different to other pumps within this family – it can reach twice the depth of similar pumps, with more efficient and powerful strokes, and it is more durable, made of steel and wood where other pumps are made mostly of PVC (de Laet & Mol 2000). Turning full circle, de Laet and Mol point out that in its durability and strength the Bush Pump is more like the Bucket Pump, so perhaps they are in the same family after all. They indicate how it is possible to shift the Bush Pump through different categories according to different criteria. While the Bush Pump is specific, and can be described in terms of its difference from other pumps, “the characteristics that distinguish it from each of these also tend to be shared with one or more of the others. For the Bush Pump, *‘being itself’ means that it is continuous with a number of others?*” (de Laet & Mol 2000, p.231).

The boundaries of the Bush Pump are fluid in that they can be drawn to include other objects. The pump, if it is to work, is not a discrete object. It relies upon other documents, equipment and constructions to work.

There it is then, the pump delivered by V&W Engineering: pump head, lever, base and underground parts. But is this it? Have we described and defined our object now? The answer is no, there is a problem, for when it's unloaded from the truck the Bush Pump yields no water. None whatsoever. It is not a pump (de Laet & Mol 2000, p.231).

The pump needs to be assembled and installed if it is to work. It must “collaborate” with a tubewell drilling device such as the Vonder Rig (de Laet & Mol 2000, p.233). The concrete headworks need to be built, according to detailed instructions. It must be placed at the correct distance from cattle kraals and latrines. If the concrete headworks are properly built, then the pump supplies not just water, but clean water. The pump becomes a provider of health. If the headworks are not properly built or sited, then (especially in the rainy season) contaminated water may flow down into the borehole, polluting the water supply. If this happens, then the pump may supply water, but not health (de Laet & Mol 2000). In this way too the boundaries of the pump, or the role it plays, are fluid.

The pump should be sited, as we have noted, both according to externally (or centrally) decided physical criteria, and according to the views of the individual community involved. The village community, ideally, is involved in assembling the pump, siting the well, making the headworks and drilling the hole, as we have described. This, de Laet and Mol write, suggests that the boundaries of the pump can be drawn so as to include the community that will use it. “In critical ways, the Zimbabwe Bush Pump includes the villagers that put it together... the boundaries around a community pump may be widely drawn. Indeed, they embrace the community” (de Laet & Mol 2000, p.235). Community participation “is quite the thing in the theory of appropriate technology. It is 1980s’ wisdom to design projects, tools and machines whose maintenance, installation and operation are ‘community based’”, write de Laet and Mol (2000, p.235). “In Zimbabwe, this has become national policy” (ibid).

When de Laet and Mol were writing, the village community was the target for government operations in Zimbabwe, “the level of collectivity most commonly addressed, and the unit the administration most strongly seeks to reinforce” (de Laet & Mol 2000, p.235). The village was the preferred unit for Zimbabwe’s water policy. Building a water infrastructure in Zimbabwe that reaches these villages is in part a nation-building exercise: “government support for buying a pump may link up the village to the state, thereby enlisting villages in what is otherwise likely to remain an abstract nation” (de Laet & Mol 2000, p.236). The Bush Pump, as a locally designed and manufactured pump, tailored for local circumstances – as earlier noted, perhaps the only example of a pump produced by an African country, certainly the

longest standing locally designed pump on the continent – is well suited to this task of ‘nation-builder’. So, suggest de Laet and Mol, “perhaps the boundaries of the Bush Pump coincide with those of the Zimbabwean nation” (de Laet & Mol 2000, p.237). The Zimbabwe Bush Pump then, as described by de Laet and Mol, “has a number of possible boundaries. A small device in some ways, in other ways it encompasses an entire state” (ibid).

3.4.1.2 “or of its working order”

“All sorts of things can go wrong with a pump,” note De Laet and Mol (2000, p.238). The pump may supply water well, but because of problems with its installation or maintenance, it may not provide health: the water may be contaminated. It may work in the wet season but not the dry. It may have been incorrectly sited through lack of adequate consultation, and so may go unused. It may work for a while and then break down. The Zimbabwe Bush Pump is fluid too, by their description, in terms of its working and not-working. “Whether or not its activities are successful is not a binary matter. There are many more relevant answers to this question than a simple ‘yes’ or ‘no’” (de Laet & Mol 2000, p.252). This is a feature both of the pumps themselves, and of the criteria used to evaluate their success. “The criteria for success are not clear-cut... the Zimbabwe Bush Pump not only has fluid boundaries, but the evaluation of its activities is fluid, too” (p.247).

De Laet and Mol draw attention to the problem of pump parts breaking or wearing out ‘down the hole’, which with the majority of Bush Pumps requires skilled workers and special equipment to raise the working parts and repair or replace them. This process may crack the concrete apron, and the pump may be idle while skilled workers are absent from the village. With the open-top models described earlier, the down-hole components can be raised more easily. De Laet and Mol describe some of the detailed design changes to accomplish this; as well as designing a narrower capsule that can travel up the rising main, the connecting rods were also redesigned, made lighter and connected through hooks and eyes rather than threaded sleeves. The first versions were only for the narrower bore pumps, as the parts used are lighter overall. De Laet and Mol describe the compromises necessary in these design changes:

If something is lost in all this - a 50mm cylinder lifts less per stroke than a 75mm cylinder, and a 12mm rod is not as versatile as its more sturdy 16mm friend - then something is gained: reparability. And if this advances long-term performance, then the trade-off is beneficial. The pump emerges perhaps less solid, but certainly more viscous: its elements are less rigidly linked. And for

long-term performance, such fluidity may be just what it needs (de Laet & Mol 2000, p.240).

Again, the pump is fluid in its reconfigurability; but fluid too in its performance – made more user-friendly, it is perhaps less immediately efficient or powerful, but with better long-term performance. Evaluating its performance requires standards that can themselves be complex and shifting.

Because the Zimbabwe Bush Pump is locally produced, spare parts are easily available. This, write de Laet and Mol, “erodes the boundary between pumps in working order and those that are broken, for it helps to turn ‘being broken’ from a final state into an intermediate stage” (ibid). And, as earlier noted, spare parts may not even be necessary – users have shown that elements of the pump can be replaced with non-standard parts, and that the pump can carry on working even without some its components. The pump is fluid too in that it can work even when parts are broken or missing, as Erpf and Morgan (via de Laet and Mol) report. The pump is in this way resilient and adaptable, and appropriate to resource-poor and sometimes remote rural areas.

The pump “requires a community to maintain it if it is to work” (de Laet & Mol 2000, p.245). Its working is contingent on marshalling a community around it for its successful installation and maintenance. It may fail to do so, being “in one way or another insufficiently attractive to become a centre” (ibid). If this happens, “if a pump fails to make the community it needs, then the community will not take care of the pump either” (ibid). This too is a factor in its degree of success or failure.

The boundaries of the pump are fluid, as noted earlier, in that it may be characterised as a water-provider, but not necessarily a health-provider, depending on how well the pump is sited, installed and maintained. In identifying the fluidity of the pump’s ‘working order’, de Laet and Mol return to the question of hygienics, drawing attention to the standards by which it is measured. “A pump works as a provider of water if water comes out of it when the pump handle is properly operated. But how to determine whether or not a pump is a successful technology for health?” (de Laet & Mol 2000, p.242). The primary health indicator for a groundwater pump is the *E.coli* count in the water it provides (de Laet & Mol 2000). *Escherichia coli* is a bacterium in the human intestine. While present in varied strains in all humans, when we encounter variants that are strange to us, we fall ill. While a potential risk in itself, the presence of *E.coli* is, more importantly, a sign that there is a pathway for contamination, from human intestine to water source, which other bacteria may follow (ibid).

Bush Pumps in general show particularly low *E.coli* levels; but what De Laet and Mol draw attention to in evaluating the ‘working order’ of the Bush Pump, are the standards used to evaluate unsafe *E.coli* levels. International standards put the *E.Coli* level acceptable for drinking water at less than 2.5 per 100ml (ibid). But de Laet and Mol point out that in Zimbabwe a measurement at any point in time does not reveal the whole picture: conditions are quite different in the dry and the rainy season, for example. It also depends on what practical alternatives are available to a community; a Bucket Pump with an *E.Coli* count higher than the international standard is still preferable to an open water-source nearby (ibid). And because of the feature of *E.Coli* noted above, that it is not necessarily harmful in itself unless ‘strange’ to an individual, much depends too on who the immediate users of the pump are. “A first move”, de Laet and Mol write, “is to recognize that in the Zimbabwean context questions of health are relative, not absolute” (de Laet & Mol 2000, p.243). While there are polar extremes, when the *E.Coli* count is so high that the whole village becomes ill, or when the count is zero for extended periods, there is “a lot going on between these extremes” (de Laet & Mol 2000, p.245). Instead of a binary boundary, “we see fluid transitions, once again” (ibid). “There are, to be sure, limits to the Bush Pump’s flexibility and elasticity”, write de Laet and Mol. “There are points where nothing works, everything fails. But before such dead ends are reached - if they are reached at all - many varied things may happen to a Zimbabwe Bush Pump. As indeed they do” (de Laet & Mol 2000, p.248).

3.4.1.3 “and of its maker”

In describing the fluidity of the Zimbabwe Bush Pump, de Laet and Mol draw in its latest designer, Dr. Peter Morgan: “he too is fluid, dissolving into his surroundings” (de Laet & Mol 2000, p.226). Morgan, designer of the B-type Bush Pump, has been involved in the water and sanitation sector of Zimbabwe since 1972 (Erpf 1998). He is the designer and developer of many other pumps and products apart from the Bush Pump. But even though he has “invested much work and effort in improving the Bush Pump... he has never claimed authorship... [and] never stresses the possible brilliance of his insights or the ingenious character of what he has invented” (de Laet & Mol 2000, p.249). De Laet and Mol describe him as a ‘non-heroic’ actor or a ‘non-classical hero’, taking difference with “conventional technology studies for all too easily marshalling the heroic agent as a bottom-line mover in, for instance, innovation and socio-technical change” (de Laet & Mol 2000, p.256).

The success of a technology does not necessarily depend on an engineer who masters the situation and subtly subdues everyone and everything involved. A

serviceable (or even submissive) inventor may help spread technologies just as well - or even better. Effective actors need not stand out as solid statues but may fluidly dissolve into whatever it is they help achieve (de Laet & Mol 2000, p.227).

Morgan sees the current Bush Pump as no more than “a perfected version of a long-established and locally-developed technology that has always been part of, and belongs in, the public domain... according to Morgan the pump is no more his than it is Murgatroyd’s, Von Elling’s or the Pump Minders’ who substitute sticks for bolts” (de Laet & Mol 2000, p.249).

When asked about the pump’s success, Morgan replied:

The pump is a government thing, developed by a government employee, in government time, at a government agency. There is no patent on it. No names are attached to it. It is the national handpump. That is its strength. That no individual has total command over it. It is in the public domain. (de Laet & Mol 2000, p.250)

Morgan’s refusal to seek ownership of the pump contributes to its success. “He refuses to take out a patent on the Pump, or on any of its recent modifications,” write De Laet and Mol, even though, “according to officers of the African Regional Industrial Patent Organization in Harare, the ‘B’ type might have been eligible for exclusive property rights” (2000, p.249). As a result, “when the users – be it actual users, donors or governments – pay for the pump, they pay for materials and production costs. But they do not pay for the right to use it. And they do not pay for a name, for legal and maintenance fees, for the overhead of patent institutions, or for the inventor’s retirement pension. Since such costs are not included in the price of the pump, the people have access to an affordable technology. And in the Zimbabwean context this greatly helps the Bush Pump to spread” (ibid).

In implementing the pump, too, de Laet and Mol write, Morgan gives up control. He learns from how users adapt and work with the pump. When he travels around Zimbabwe to monitor pump installations, he is “not intent on keeping the pumps as they were delivered: intact, in shape, shining like new” (de Laet & Mol 2000, p.251). He is instead curious to see how they have evolved, how users have adapted them. In consulting community representatives on the siting of pumps, as described, Morgan is promoting ‘distributed action’, rather than centralised control (de Laet & Mol 2000). “Implementation... requires room for [the users’] methods and insights. Without this, any pump is bound to fail. For, as he [Morgan] says, in water development it is all too common that the new and the foreign does not work,

and that ‘all that glitters ... end[s] up as a rusty heap of useless technology’” (de Laet & Mol 2000, p.251).

In addition to his personal commitment to these ideals – for affordable, state-funded technology that is adaptable to users requirements, for refusing profit and promoting distributed action – Morgan also described to me another frame for his non-heroic actorship. The Bush Pump’s origins in colonial and then white minority-rule Rhodesia doesn’t prevent the post-independence Zimbabwean state from taking pride in the pump as a national object, as long as its white inventors are “dead or quiet about it” (Morgan 2010). Morgan as a nonheroic actor is suited to this role. As someone who keeps himself in the background by personal preference, he is also in a position of subtle influence: local government officials visit him to ask his advice on the sector, knowing him to be outside of party politics (ibid). We might call Morgan in this way a product of the patronage system around the Bush Pump, as Field is perhaps a product of the patronage system around the *PlayPump*.

Looking back over de Laet and Mol’s formulation of fluidity as exemplified by the Zimbabwe Bush Pump, the B-type most especially, they first described the ‘boundaries’ of the pump as fluid. It moves between an object that is changeable over time, and continuous with a number of other pumps, to a conglomeration of objects; it embraces a village community, and as a ‘nation-builder’ its boundaries could reach right out to the boundaries of the state. It could be a health-provider – a hygienic object – or given a less meticulous installation or maintenance, only a water-provider. In describing the Bush Pump in this way, de Laet and Mol reveal it as not absolute in its size or reach, but “descriptively and practically – framed in a range of different ways” (de Laet & Mol 2000, p.237). Each of these frames has a correspondence with its appropriateness as a technology: capable of both durability and adaptation over time in response to continual reassessment; drawing widely on work that has gone before, sharing successful features of similar technologies; drawing in the community that is to use it and must maintain it; and standardised to meet locally-set criteria and to be more easily maintained, as a pump that ‘builds the nation’.

The ‘working order’ of the pump too is fluid: its success and failure is a matter of degree, and is dependent on how it is installed and maintained; some features may be compromised to enable others; and the pump has a good ability to keep on working even when compromised. “Good technologies”, write de Laet and Mol, “may well be those which incorporate the possibility of their own break-down, which have the flexibility to deploy alternative components, and which continue to work to some extent even if some bolt falls out or the

user community changes” (2000, p.252). And evaluating the pump’s working and not-working requires flexible standards appropriate to its context.

The pump’s maker, Dr. Peter Morgan, too is fluid, in his refusal to claim exclusive authorship, in his self-dissolution, giving up control of the pump. The pump is more affordable because it is in the public domain; in responding to the way the pump is used and modified, its design becomes ever more ‘appropriate’; and it is more successfully embedded in the user-community because control of it is not wholly centralised. As de Laet and Mol write, “sometimes abandoning control may contribute to spreading what one has been making” (2000, p.250). Indeed – and this will be useful to examining what happened to the *PlayPump* as it spread beyond South Africa – a feature of the fluidity of the Zimbabwe Bush Pump is its ability to “transport well” (de Laet & Mol 2000, p.3). De Laet and Mol note that “in technology studies, much has been written about the enormous difficulty of moving technologies, of transferring them from one site to another” (ibid). Morgan, as a “submissive” inventor, may help to spread technologies “just as well - or even better” than one who “masters the situation and subtly subdues everyone and everything involved” (de Laet & Mol 2000, p.227).

3.5 Summary

This chapter began by noting the identification of contemporary design for development with the history of work in ‘appropriate technology’. Contemporary design for development objects are often called appropriate technologies, and recent texts from design for development forums draw attention to the origins of current design attention to the developing world in the work of seminal figures in the appropriate technology movement such as E.F. Schumacher.

While identifying itself with appropriate technology, the current field has some tension with it. Some contemporary practitioners’ work seems to carry forward Schumacher’s concerns with providing employment in the developing world, and with fostering self-reliance through meeting local needs with locally-produced technology, made with readily available materials. Some recent approaches extend his early work, seeking greater involvement from users in designing solutions to their local problems. But other recent work departs from Schumacher’s principles, choosing to see the developing world poor as customers for products that may be designed and mass-manufactured outside of the developing world, and that generate profits for international businesses.

In seeking profits for mass-produced items designed for developing world conditions, some design for development objects are marketed simultaneously to first-world consumers: in the process, design for development objects acquired first-world audiences, and the meaning of 'appropriate technology' became perhaps curtailed: it is used to refer to small-scale objects designed for developing world use, but it is no longer as critical or holistic as it was originally intended to be.

An example of a highly successful and long-standing appropriate technology, the Zimbabwe Bush Pump, was examined. The Zimbabwe Bush Pump provides a good comparison with the *PlayPump*, which also claims to be an appropriate technology for water provision, and which operates in the same general geographical region. The Bush Pump was analysed using De Laet and Mol's formulation of 'fluidity' to describe what makes it 'appropriate' by their definition. This frame for analysis will be applied to the *PlayPump* in Chapter 7.

The objects in the next chapter are examples of contemporary 'interventionist' artwork, functional, activist objects designed to equip the vulnerable to access basic resources, while communicating social issues to the public.

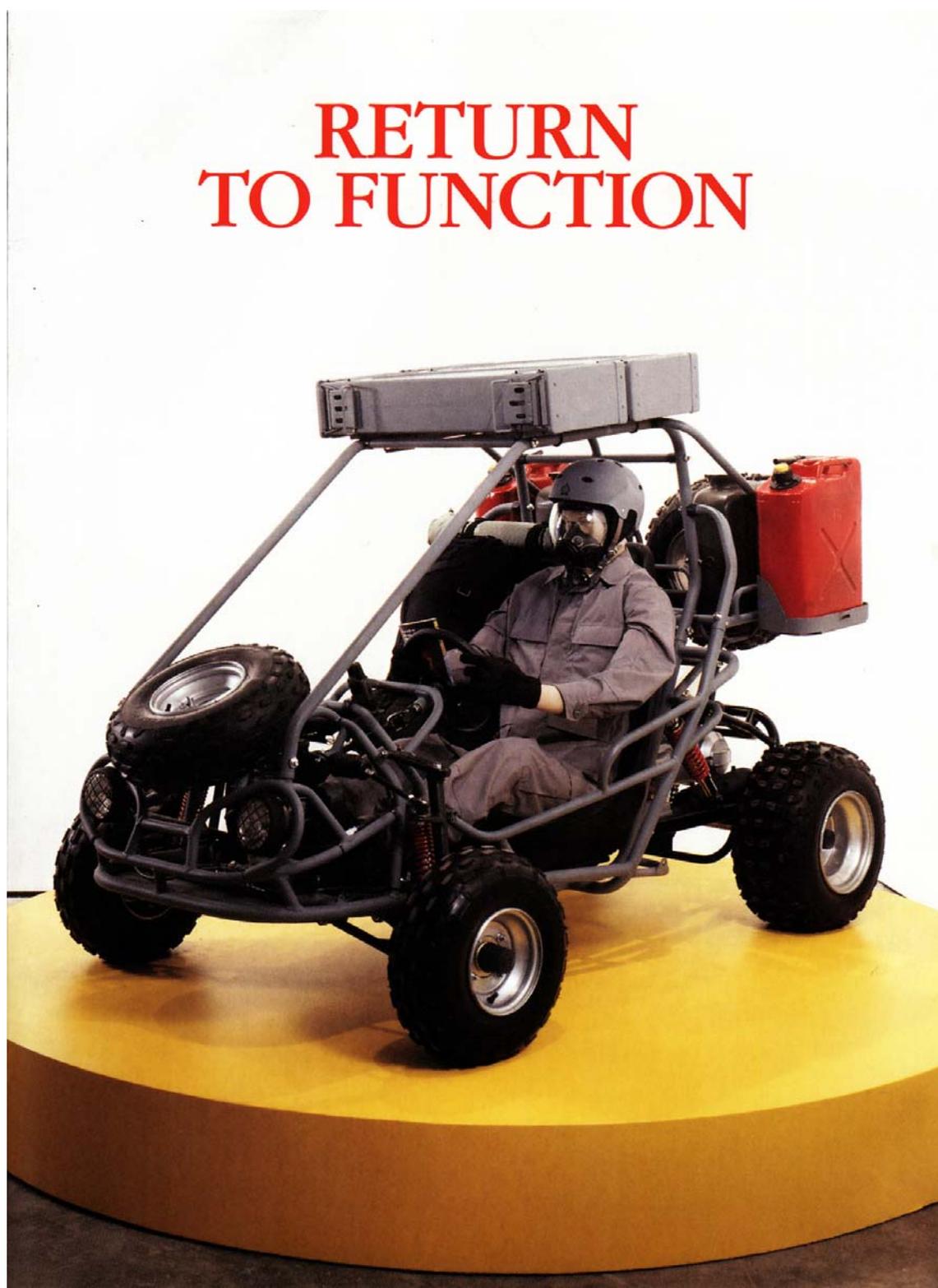


Fig 4.1: Invitation to the exhibition *Return to Function* at the Madison Museum of Contemporary Art (2009). The artwork depicted is *Personal Survival Doom Buggy* (2005) by Jules de Balincourt in collaboration with Paul Stec.

Chapter 4

Art intervenes

No longer working with the metaphor of gunpowder, one uses gunpowder itself.

Cildo Meireles, 'Insertions into Ideological Circuits 1970-75', *Cildo Meireles*, 1999, p.113

4.1 Introduction

This chapter maps the ways critical, functional objects in the art world act for users while communicating to audiences, and examines their play with networks and systems. Some contemporary artwork displays an interest in design for development and appropriate technology, with artists appropriating existing objects from these fields, as well as producing their own objects of this type.

A trajectory for this kind of work is identified: from appropriating functional objects divorced from their original context, through appropriating functional objects with reference to their 'real-world' use, to creating novel functional objects designed to communicate issues: from framing to synthesising. The chapter first briefly documents examples of this appropriation and production, and contextualises this work within the broader interest of contemporary artists in designing functional objects, and of intervening directly in society. In producing functional objects, contemporary artists have not abandoned representation and communication to audiences, but produce objects that combine these attributes. In crossing into the territory of design, while retaining the critical and communicative aspects of art, such work blurs the boundaries between the disciplines. Examples are drawn from the confluence of this kind of work with an activist or 'interventionist' urge in contemporary art.

The second half of this chapter examines two examples of contemporary artwork which equips users while communicating to the public. *paraSITE*, by Michael Rakowitz, is a series of custom-made inflatable shelters for homeless individuals, and *Brimco*, by Judi Werthein, is a small run of factory-made sneakers that were designed for, and distributed to illegal border-jumpers from Mexico into the United States. These projects are interpreted using the work of two other artists that have formulated approaches to communicating to the public through

functional objects: Cildo Meireles' 'Insertions into Ideological Circuits', and Krzysztof Wodiczko's 'Critical Vehicles'.

Meireles' work identifies the possibility for artists to distribute messages to the public by inscribing them on objects in circulation in society, such as money or commodities; and his approach can be extended to ways of diverting or redistributing the goods within such 'circuits'. Wodiczko's work outlines his approaches to producing equipment for marginalised groups that allows them to communicate their social circumstances to the broader public.

In doing similar work to design for development by equipping vulnerable users with novel objects, and in articulating their desire to communicate to audiences through these objects, the artists and work in this chapter produces perspectives for examining the *PlayPump*, and recent design for development, which also performs these actions.

4.2 Functional and interventionist art

Some recent contemporary artwork involves the production of functional objects intended to assist poor or vulnerable people in the developing world, and the first world. In this it echoes Bloemink's extending the bounds of *Design for the Other 90%* to include not only "farmers barely subsisting in Africa but also southern Americans who lost most or all of what they had in the devastation caused by Hurricane Katrina" (2007, p.6). Much of this artwork, including the examples covered in this chapter, is activist in intent, seeking to equip vulnerable people at the same time as it protests the conditions that make them vulnerable. Functional objects are used as a way of getting issues to public attention, aiming to reach audiences beyond the systems of art. Some may generate interest or indignation to attract the attention of the mass media, making tactical use of the mass media's requirements for news items that excite viewers. Some work looks very much like design for development, and like projects in that field, objects move between work 'in the world' and exhibition in galleries and museums.

Some of this work appropriates existing design for development and appropriate technology objects. Marjetica Potrc, an internationally awarded and exhibited artist, has exhibited the *Hippo Water Roller*, the South African rolling water-barrel described in Chapter 2, along with other design for development objects in her series of installations titled *Power Tools* (2001 – ongoing). The series is described on the artist's website as a collection of "experimental prototypes and utilitarian objects" (n.d.-b). It also includes the hand-cranked cell-phone charger made by Freeplay, featured in the exhibition *SAFE* (2005) at the NY MoMA.

In a separate artwork, *A Hippo Water Roller for Our Rural Times* (2005), Potrc accompanied exhibition of the *Hippo Water Roller* with hand-painted images and text attesting to the way the object excites her imagination with its promise of easy solutions to the problem of water. “Water is good. Before Hippo, water was heavy. With Hippo, water is light. Hippo stores water well. The school is full of children. And what’s more – Hippo protects against landmines” (Potrc, Marjetic 2005). In the poetic language of these first few sentences, Potrc describes the *Hippo Water Roller* as something like a magical object – it can make water light. The ‘before’ and ‘after’ effect is portentous, as if a seismic shift has occurred with the object’s conception. It can fill schools with children; and “what’s more” (miracle upon miracle) it can protect against landmines. Potrc receives, amplifies and re-projects the claims of impact and emphasis on uplifting narratives that are characteristic of design for development. Though she is “as much a social scientist and anthropologist as she is an artist and architect” Potrc “sees herself primarily as a storyteller” (Curry Stone Design Prize 2008). Her interest as a storyteller in design for development objects demonstrates the high potential they have as ‘characters’ within a narrative.



Fig 4.2: Marjetic Potrc, *A Hippo Water Roller for Our Rural Times* (2005) (left); *Caracas: Dry Toilet* (2003) on site, project documentation (middle); *Caracas: Dry Toilet* (2003) Installation in Galerie Nordenhake (right)

In addition to exhibiting design for development objects made by others, Potrc’s production involves implementing appropriate technology projects in the developing world (as well as in first world locations such as post-Katrina New Orleans (Curry Stone Design Prize 2008)). Her project *Dry Toilet* (2003) saw the construction of two ‘dry toilets’, appropriate technology staples which do not require water or connection to the sewerage system, in the La Vega neighbourhood, a shantytown or ‘barrio’ in Caracas, Venezuela. The installation of the toilets came as the culmination of a 6-month research period into the living conditions of the barrios

(Basualdo & Laddaga 2004). Potrc's work onsite in La Vega, as with her other projects 'in the field', was documented through installations in art galleries - for example on the exhibition *Caracas: Dry Toilet* at the Galerie Nordenhake in Stockholm in 2004 (pictured in Fig 4. above).

Potrc's work in appropriating existing functional objects designed by others, as well as making her own, indicates approaches to working with functional objects amongst contemporary artists that have developed over the last century of modern art. As examples of the use of functional objects in art, we could note the trajectory between the urinal in Marjetica Potrc's gallery installation of *Dry Toilet* (2003), and the urinal in "that old modernist saw" Marcel Duchamp's *Fountain* (1917) (Basualdo & Laddaga 2004, p.166). Duchamp's work is a urinal turned on its back and signed with the pseudonym R.Mutt, exhibited devoid of context. Duchamp titled his work specifically to separate it from its everyday use as a utilitarian object, inviting the viewer to contemplate it as something other than what it is designed for, perhaps to appreciate its form devoid of context – though knowing its original context helps its other purpose, to disrupt the boundaries of what constitutes (or constituted) 'art'. Potrc's urinal is by contrast presented in a mock-up of the space in which it is installed in La Vega, accompanied by documentation of the project onsite. While both can be read as sculpture and as functional objects, Duchamp's work presents more of an invitation to contemplate the object as an artwork defined by the gallery space – dislocating the object – whereas Potrc's is more a reference to the object's actual use outside the gallery. She is an example of contemporary artists who "eschew making stable, self-sufficient objects that are removed from the particular physical or social contexts in which they appear" (Basualdo & Laddaga 2004, p.166).



Fig 4.3: Detail of *Caracas: Dry Toilet*, (2003) at Galerie Nordenhake (left); Duchamp's *Fountain*, (1917), on exhibition at the Tate Modern, (right).

This trajectory from modern art's concern with “everyday functional objects taken out of context” (Schwendener 2009), through everyday functional objects presented *with* context, could be extended on to the design of new objects especially designed both to function for a user, and to continue art's concern with representation and communication. Potrc's toilet is not particularly her design, but that of an existing appropriate technology; and it isn't particularly expressive in itself – the communication to audiences is in contextualising information around the object, rather than through its form. An example of a functional artwork that takes a step further towards novelty and communication through form is the project *Supergas* (1996) by Danish art collective Superflex, who take an existing appropriate technology design, but expressive it in a novel form.

Supergas centred on their design for a biogas collection unit for use in the developing world. The collection units, brightly coloured plastic pods, are used to collect biogas from animal and human faecal matter, producing “approximately 4 cubic metres of gas per day from the dung from 2-3 cattle... enough for a family of 8-10 members for cooking purposes and to run one gas lamp in the evening”, according to Superflex (Superflex n.d.). The collective went through many of the same processes as a design for development project, performing field work, collaborating with engineers, and securing patents (Superflex 2003). The project shares some of the problems of design for development projects too. Like the *Q-drum*, the project has remained largely at the prototype stage after limited field trials; and like the *PlayPump*, repair or modification of the unit by users would be difficult. Similar to the *PlayPump*, the project takes a known technology (here biogas collection) and expresses it in a novel and spectacular form, in Superflex's signature ‘Superorange’.



Fig 4.4 *Supergas* (1996) in the field in Cambodia and Thailand. All 3 images here are from Superflex's website.



Fig 4.5 *Supergas* (1996) on the exhibition *Something Rotten* at Museum Fridericianum, Kassel, Germany, 1998.

Some recent exhibitions in major institutions have presented art that seeks to be ‘useful’ or functional in the world in ways that include but also go beyond communication, representation or aesthetic contemplation. The art exhibition *Return to Function* at the Madison Museum of Contemporary Art (MMoCA) in 2009 showed a number of contemporary functional artworks. Objects on the exhibition range from a vehicle, to a weapon, clothing, laboratory apparatus for school children, furniture, a cheap DIY coffin, and temporary shelters. In her introduction to *Return to Function*, curator Jane Simon writes that the art works on the show “suggest that objects can play a central role in improving our lives” (2009b), with “many of them intended to execute tasks or fulfil roles usually assigned to everyday or design items” (2009a, p.41). The exhibition, in the words of MMoCA director Stephen Fleischman, presents “thought provoking” work “by twenty contemporary artists or artist teams who make functional objects – art that increases social awareness” as it responds to “the challenges of everyday life, addressing people’s changing needs for fundamental necessities such as transportation, shelter, and clothing” (Fleischman 2009). Simon characterises the art objects on exhibition as both functional and agitational – “functioning prototypes that might initiate... discussion” (Simon 2009a, p.19).

The artworks used as the main examples for analysis in this chapter pay particular attention to the form of the functional objects they produce, as communicative devices for introducing social issues to the public. This is part of the urge of contemporary artists in using functional objects – to have a direct impact in the world outside the gallery. It is to this desire which Brazilian artist Cildo Meireles’ statement at the head of this chapter refers: “No longer working with the metaphor of gunpowder, one uses gunpowder itself” (Herkenhoff et al. 1999, p.113). It is a militant statement, which refers not just to the move from representation to function in art, but to the context in which he was working: Brazil under a military

dictatorship in the 1970s. He devised ways to place political messages into public circulation beyond the gallery, using approaches outlined in his work ‘Insertions into Ideological Circuits’, which is used to analyse the examples of interventionist artwork in the second half of this chapter.

This activist or ‘interventionist’ direction in artists’ work with functional objects is the other trajectory, in addition to the shift from found to novel objects, which this chapter identifies. The art exhibition *The Interventionists* at the Massachusetts Museum of Contemporary Art (Mass MoCA) in 2004 displayed a range of creative tools and techniques for political and social activism, including mobile shelters for homeless people, clothing for disguise, and bags made for shoplifting. They are projects intended to materially intervene in the world, “made to operate within and upon systems of power and trade using the techniques of art” (Thompson & Sholette 2004, p.13). Nato Thompson, co-curator of the exhibition, draws attention to the shift in politically motivated art in the U.S in the 1990s, which much of the work in *The Interventionists* represents. “Instead of representing politics (whether through language or through visual imagery), many political artists of the 1990s enter physically; that is, they place their work into the heart of the political situation itself” (Thompson & Sholette 2004, p.13). She characterises this work as employing “the tactics of intervention”, connecting it to mid-20th century Western art movements (especially Situationism) whose ideas have been revived and reinterpreted at various points since their inception (Thompson & Sholette 2004, p.13).

One of the artists represented on the show was Krzysztof Wodiczko, with his project *Homeless Vehicle* (1987 - 88), part of his series of ‘Critical vehicles’ that equip marginalised groups in the first world while communicating the circumstances of their marginalisation to the public. His writing and artwork for ‘Critical vehicles’ is the second perspective used, after Meireles, in analysing the examples of interventionist artwork in the second half of this chapter. Also on *The Interventionists* was Wodiczko’s former student, Michael Rakowitz, whose work *paraSITE* (1997 – ongoing), a series of temporary shelters for homeless individuals, is one of the main examples analysed in this chapter.

paraSITE has been selected for numerous exhibitions and awards, some in forums shared with design for development objects. It was exhibited on *SAFE* at the NY MoMA in 2005, also host to several design for development objects; it was a finalist in the *INDEX: Awards* in 2005, along with the *Hippo Water Roller*; it appeared in Architecture for Humanity’s book *Design Like You Give a Damn*, in which the *PlayPump* featured along with several other design for development objects; and it has been extensively reported in the press. While this project moves between forums for design, architecture and art, Michael Rakowitz’s overall work,

“informed by an idiosyncratic blend of performance, sculpture and graphic design” is as an artist, represented by Lombard-Fried Gallery in New York (Tiven 2007).

The second main example of interventionist artwork analysed in this chapter is *Brinco* (2005), a project by Argentinian artist Judi Werthein, which equips illegal immigrants from Mexico to the US with shoes to assist their border crossing. Similar to Potrc’s work in Caracas, the project was the result of a lengthy research period in the Tijuana-San Diego border zone (inSite_05 2005a). An installation of the project is in the collection of the Tate Modern art museum in London, where it was exhibited in 2007 in the group show *The Irresistible Force*. Where *paraSITE* has some of the characteristics of an ‘appropriate technology’, using available materials to build cheap and resourceful shelters in collaboration with homeless individuals, *Brinco* is more like contemporary ‘design for development’ product, funded partly by sales of the sneakers to first world consumers, and distributed BOGO-like to the poor.

Both projects succeeded in generating much public attention for the social issues they engage with, through activating the interest of the mass media. Discussing these projects, calling on Meireles’ and Wodiczko’s work, reveals ways in which artwork of this type may make tactical use of existing systems in the environment; how they may communicate to audiences while equipping users; and how their creators acknowledge the limits of their action.

4.3 *paraSITE*

paraSITE (1997 – ongoing) is a series of inflatable shelters for temporary use, custom-made for homeless individuals in the cities of Boston, Cambridge, Baltimore and New York by American artist Michael Rakowitz. The shelters are made from thin polyethylene plastic sheeting. The plastic sheeting is taped and heat-sealed together to create a hollow-walled, igloo-like structure. The ribbed, hollow walls become rigid when filled with air. The source of inflation for the shelters is the heating vents of city buildings, to which the shelters are designed to attach, and for which ‘parasitic’ relationship the project is named. The waste air from a building’s heating system fills the walls of the structure and maintains its shape, while also heating it. The shelters cost “approximately five dollars each to make” (Antonelli 2005, p.68) and are given to their users. Around 30 shelters have so far been produced, and Rakowitz in 2007 said “it’s still one of the mainstays of my production: I do it every winter” (Tiven 2007).



Fig 4.6: Joe Heywood's *paraSITE* shelter, Manhattan (2000). Photograph by Michael Rakowitz.



Fig 4.7: Bill Stone's *paraSITE* shelter, Harvard (1997). Photograph by Michael Rakowitz.

The project was initiated by Rakowitz in collaboration with Bill Stone, a homeless man, in response to measures taken by the city of Cambridge, Massachusetts to remove the homeless from public spaces and from the public eye. In 1998 city authorities began 'homeless-proofing' the city. They tilted the grates on a series of hot-air vents on which homeless people would sleep in Harvard Square so as to make them impossible to lie on. This is part of a wider pattern of administrative tactics to reduce the number of people 'sleeping rough' in public places, including benches that are impossible to sleep on, and "sprinkler systems to soak homeless citizens in parks" (INDEX: Awards 2005). These actions by city administrators are designed to restrict the homeless to homeless shelters, which conflicts with the desire of some homeless people to stay out of shelters and in public spaces. Bill Stone regarded the project as "a tactical response" to these measures (Architecture for Humanity 2006, p.192).

paraSITE 'amplifies' for the pedestrian who encounters the shelter in the street, as well as for the people who encounter it through exhibitions or in the press, "the problematic relationship between those who have homes and those who do not have homes" (Rakowitz n.d.). It functions as an "agitational device... calling attention to the epidemic of homelessness" (Architecture for Humanity 2006). It is intended to communicate resistance to city administrators and policy makers, both directly and through the public who are instigated to confront administrators over the issue of homelessness. It is designed to pressure policy makers in this way. The *paraSITE* shelters are also communication devices for their users, for whom, writes Rakowitz, "they functioned not only as a temporary place of retreat, but also as a station of dissent and empowerment; many of the homeless users regarded their shelters as a protest device, and would even shout slogans like "We beat you Uncle Sam!" The shelters communicated a refusal to surrender" (Rakowitz n.d.).

Like the *PlayPump*, *paraSITE* has an immediate, narrative symbolism. Where for the *PlayPump* this is the idea of work accomplished through children's play, for *paraSITE* its visible attachment to a building via its long 'umbilical cord' or sucker tells a story both of dependence and a resourceful, creative accessing of available resources, "a symbolic strategy of survival" (Rakowitz n.d.). "The visibly parasitic relationship of these devices to the buildings" writes Rakowitz, "elicited immediate speculation about the future of the city... would these things completely take over, given the enormous number of homeless in our society? Could we wake up one morning to find these encampments engulfing buildings like ivy?" (Rakowitz n.d.). The project represents a rupturing of the normal, in which creative, informal measures for survival intrude into the regulated first world city, and it warns of the consequences of ignoring a social ill in an affluent society.

The organic, translucent forms of *paraSITE* contrasts with the hard, opaque planes of the buildings and pavements around them – the shelters are not disguised. Their use of waste air from buildings also means they must be sited in the city, visible in public space. This making visible is part of the work the project does. It is intended to make “more visible the unacceptable circumstances of homeless life within the city” (Rakowitz n.d.). The project creates controversy with residents and administrators of cities “who would rather not “see” the issue” (Antonelli 2005, p.68).

Rakowitz emphasizes the symbolic and communicative functions of the project over its possible impact on the broad problem of homelessness. “The issue of homelessness is of global proportions and it is foolish to think that any one proposition will address all the issues associated with this problem” writes Rakowitz on his website. It is a “symbolic strategy” – the project, he makes sure to point out, “does not present itself as a solution. It is not a proposal for affordable housing” (Rakowitz n.d.). “It is very much an intervention that should become obsolete. These shelters should disappear like the problem should. In this case, the real designers are the policymakers” (Antonelli 2005, p.68).

4.4 *Brinco*

Brinco (2005) was a project to produce a limited run of factory-made, custom-designed sneakers (trainers, or running shoes) designed for use by illegal border-jumpers crossing from Mexico to the United States by foot. The project is the work of Argentinean artist Judi Werthein, and was her contribution to the ‘Interventions’ section of the *Insite05* art project, for which artists are “commissioned to intervene in the social fabric of the San Diego-Tijuana corridor”, a US-Mexico border-crossing and a popular site for illegal crossings (inSite_05 2005b).

‘Brinco’ means ‘jump’ in Spanish, and is Mexican slang for an illegal border-crossing. The shoes have a number of features to assist the wearer in their journey and to appeal to or express Mexican cultural allegiances. The inner sole of the shoe is printed with a map of the border region, and a compass, flashlight and pockets for money and medication are incorporated into the shoe. The heel and sides of the shoe display an Aztec eagle, a symbol of ethnic pride in Mexico as an historic power. On the toe is the American eagle found on the 25c piece, “to represent the American dream the migrants are chasing” (Isackson 2005). On the heel is an image of Santo Toribio Romo, “the official saint of the Mexican immigrant” (Branding Democracy 2008).



Fig 4.8 Chart displaying the features of the *Brinco* sneaker, from the *Insite05* website.



Fig 4.9. *Brinco* shoes distributed to prospective border jumpers, from the *Insite05* website.

Some of the shoes were distributed free to people preparing to cross the border on the Mexican side, and some were sold in boutique sneaker stores in San Diego and New York, for US\$215 a pair with “proceeds going to a [migrant] shelter in Tijuana” (Borthwick & Greenberg 2007). “*Brinco* is fashionably designed, well made, and practically equipped for the trek of an illegal immigrant. Setting a tension between the functionality and uselessness of this artwork, as well as its paradoxical struggle for both uniqueness and ubiquity, *Brinco* is also displayed under a labeled vitrine in Blends, a tennis shoe boutique in downtown San Diego” (e-flux 2006).



Fig 4.10: *Brinco* shoes on display in *Blends*, a boutique sneaker store in San Diego, 2005

Wertheim had the shoes manufactured in China. Each shoe is embroidered with the statement “this product was manufactured in China under a minimum wage of \$42 a month working 12-hour days” (The Balkans Project 2009). *Insite05* describes the project as addressing issues of global labour, “underscoring the tensions sparked by the global spread and mobility of the *maquiladora*” (inSite_05 2005a). The *maquiladora* is the Mexican name for the free-trade zones that operate there and in other parts of the developing world, including China. They are semi-autonomous zones run by international corporations within developing countries, usually exempt from local taxes and duties, enabling cheap manufacture of goods to be sold in the first world. At least some of the Mexicans crossing into the US are rejecting work in the *maquiladora*, in which their country’s lower wages and costs are exploited, by crossing the barrier into the first world itself. Manufacturing jobs in Mexico and the US may also have been lost to the Chinese equivalents of the *maquiladora*; these free-trade zones enable the rapid mobility of international corporations in their search for the cheapest deal.

Brinco reached a much wider audience than the border-crossers, shoe shoppers, or the art world through the attention it received in the press. “After one month of free distribution in Tijuana and successful sales of the *Brinco* sneakers in San Diego and New York, Judi Wertheim’s project created a dramatic discussion about immigration and global labor, as

covered by CNN, CBS, FOX, BBC, and numerous television and radio stations in and around San Diego and Tijuana” (inSite_05 2005a). The website for *Branding Democracy*, a project by The New School in New York, refers to it as a “media firestorm” in which Wertheim was “accused by CNN anchor Lou Dobbs and Fox News reporters of aiding and abetting illegal immigration” (Branding Democracy 2008). Wertheim exhibited her project as an installation that included documentation of the media response. In this way *Brinco* in installation literally incorporates the media response it was designed to elicit. The installation took the form of a mock sneaker store, with *Brinco* shoes displayed alongside other real sneaker brands.



Fig 4.11: *Brinco* (2005) - Installation with 3 pairs of sneakers, vinyl, paper, and monitors.

Like Rakowitz, Wertheim emphasizes the communicative and agitational aspect of her project over its immediate impact on a particular social problem, and directs our attention to the larger influences at work. She “dismisses complaints that she is aiding and abetting illegal immigrants”, arguing that she is “just provoking an important discussion. The real incentive for illegal immigrants, she says, is Americans’ demand for cheap labour” (Isackson 2005).

4.5 Discussion

This section discusses *paraSITE* and *Brinco* together. The discussion is divided into two sections: ‘Insertions into circuits’, which draws on Cildo Meireles’ work; and ‘Critical vehicles’, which uses Krzysztof Wodiczko’s work, to frame Rakowitz and Wertheim’s projects. The perspectives established in this discussion contribute to the reanalysis of the *PlayPump* in Chapter 7: Reanalysing the *PlayPump* 2: critical lenses.

4.5.1 Insertions into circuits

Playing upon systems in society, to reveal them, disrupt them, redirect them, or to insert messages into them is a tactic typical of interventionist artwork. It is an “art of the weak” (de Certeau 1988, p.37) by which groups who do not have centralised control of systems can

make use of their power. Cildo Meireles formulated an approach to working with systems in society with his project *Insertions into Ideological Circuits* (1970), which “arose out of the need to create a system for the circulation and exchange of information that did not depend on any kind of centralised control... to achieve an increase in equality of access to mass communication” (Herkenhoff et al. 1999). The need to find alternative routes to a public was in part a result of the environment Meireles was working in, under a military dictatorship in Brazil, which restricted forums for public expression, including the press and the art world. Meireles wrote:

The work began with a text I wrote in April 1970 which sets out this position:

1. In society there are certain mechanisms for circulation (circuits).
2. These circuits clearly embody the ideology of the producer, but at the same time they are passive when they receive insertions into their circuits.
3. This occurs whenever people initiate circuits (Herkenhoff et al. 1999).

One of the works Meireles made in the series of interventions that resulted is *Coca-Cola Project* (1970). Meireles made use of the system of returnable bottles used by Coca-Cola in Brazil, printing the message “Yankees go home” onto the bottles, in reference to US support for the dictatorship in Brazil, before returning them to the store, from where they would go back out into public circulation. In a variation of the project he labelled the bottles with a formula for making a Molotov Cocktail (Morais 2009). Meireles disguised the messages by printing them in the same white type as the existing text on a Coca-Cola bottle; this also meant that the text was only visible when the bottles had been refilled for circulation (Barnitz 2001).



Fig 4.12: Cildo Meireles, *Insertions into Ideological Circuits: Coca-Cola Project* (1970).

Meireles saw the purpose of insertions as to introduce information to a circuit that conflicted with the message of the circuit itself – here the “cocacolonization”, of Latin America, protesting both the US’s cultural imperialism and its more directly malign influence in supporting the military government in Brazil (Barnitz 2001). The process of insertion “contrasts awareness (a result of the insertion) with anaesthesia (the property of the existing circuit). Awareness is seen as a function of art and anaesthesia as a product of the alienation inherent in industrialised capitalism”, wrote Meireles (Herkenhoff et al. 1999). For another project in his series of ‘insertions’, Meireles printed the message ‘Quem Matou Hertzog?’ – ‘Who Killed Hertzog?’ onto bank notes, drawing attention to the killing of the journalist Wladimir Hertzog, presumably by government agents, circulating a question the state did not want asked (Barnitz 2001).

4.5.1.1 Making insertions

With traditional communication channels restricted, Meireles wanted to reach the public directly with his art. “This was what one had in one’s head at that time: the necessity to work with the idea of the public. Many Brazilian artists were including everyday materials and actions in their work; directing the work towards a large, indefinite number of people: what is called the public” (Herkenhoff et al. 1999, p.110). In order to get messages to a public, Meireles needed to selected particular channels, or ‘circuits’ that could be effective in doing so, and he needed to match the form of his messages to them to avoid easy rejection by the circuit.

Wertheim’s choice of the sneaker as a medium for her communication to audiences, parallels Meireles’ choice of Coca-Cola bottles as a medium for his. Both sneakers and Coca-Cola are ubiquitous commodities in circulation across varied strata of society. The sneaker is “frequently cited as an iconic commodity of the twentieth century” (Gill 2009, p.516). But rather than literally writing messages on a specific existing commodity object in circulation, as Meireles did on Coca-Cola bottles, Wertheim produced her own entire object for *Brinco*: she mimicked a *type* of commodity in circulation. Taking a wider view, we could see *Brinco* as the insertion of Wertheim’s shoes into a market of many shoe brands. The way she exhibited the project in installation as a mock-up of a shoe-store, with the *Brinco* brand alongside other brands, depicts it as an insertion into this larger system.

Wertheim’s desire to “engage constituencies outside the art world” is evidenced by her use of “vernacular forms such as... designer sneakers” (The Balkans Project 2009). Using sneakers as a vernacular form for distributing messages to a public echoes Wertheim’s approach in other

work: in her project *Manicured* for the Bronx Museum, Wertheim chose ten paintings from the Museum's collection to be rendered as nail decals, a popular black and Hispanic form of body decoration that reflected the demographic of the Bronx. She hired professional manicurists to offer free nail decals of the paintings to museum visitors, translating works of high art into a vernacular form that travelled beyond the gallery on the bodies of its wearers. Using sneakers as medium for communication meant *Brinco* was distributed out into public spaces, both in the streets of Tijuana and in the US. The sneaker is a particularly global commodity, desired and worn all over the world. Using this form made for a product that could appeal to both poor Mexican immigrants and hip first world consumers.

The sneaker is a “preeminent example of post-industrial manufacturing and global economic organisation, the growth of brand culture, and lifestyle niche marketing”, at the centre of a global industry estimated at US\$26 billion dollars (Gill 2009, p.517). The *Far Eastern Economic Review* in 1996 proposed it as a new product model for economics that “illustrates the realities of trade and globalisation” (Gill 2009, p.518). Choosing the sneaker market as a circuit for insertion allowed Wertheim to comment on the global systems of which sneakers are an iconic representation: making the *Brinco* shoe a multivalent object that sits at the intersection of a number of different systems and flows. Wertheim with *Brinco* “examines how a simple pair of shoes can be a product of cheap labour in a globalised marketplace, a functional tool and a luxury commodity” (Borthwick & Greenberg 2007). The project comments on the opposite tendencies of the maquiladora and workers, which are both migratory, but whereas workers travel in search of higher wages, Wertheim describes the maquiladora as “factories that migrate in search for low labor wages” (Borthwick & Greenberg 2007).

At the time that Meireles was writing in 1970s Brazil, a circuit that he did not see as a possible site for insertions was the mass media. The system of communication he sought to establish would be “essentially opposed to the media of press, radio and television” as channels dominated by powerful elites (Herkenhoff et al. 1999, p.110). Both *paraSITE* and *Brinco*, as a typical tactic of contemporary interventionist art, see the mass media as another circuit through which they aim to circulate their messages, and both have had success in doing so. Both *Brinco* and *paraSITE* conform to some extent to the needs of the mass media, matching the message to the circuit in the way Meireles proposes, in producing novel physical objects that are active characters in provocative narratives, and so make for good ‘quirky’ or incendiary news items. They hope to carry other messages beneath these media-friendly, or media-baiting surfaces.

Mass media networks are no doubt more open now to such insertions than they were in the time and place Meireles was writing. Activist and media artist⁵ Jonah Peretti attributes his ability to get messages into the mass media to the rise of the internet, or ‘micro-media’, which at some of its nodes crosses into the mass media (Peretti 2001). This was illustrated by the best-known example of Peretti’s work, which also involved the sneaker as a site for critical messages, several years before *Brinco*. Wertheim wrote a message into *Brinco* shoes that revealed the conditions of its manufacture; Peretti sought to do the same, but to have Nike do it for him. When Nike in 2001 offered a service for consumers to customise their sneakers, Peretti asked to have the word ‘sweatshop’ embroidered on the shoes (Peretti 2001). Peretti documented the exchange of emails between himself and Nike that followed, and despite their refusal to fulfil his request, his documentation of their communication ‘went viral’ as an early internet meme, “reaching millions of people” and culminating in coverage in mainstream media outlets such as “*Time*, the BBC, the *Los Angeles Times*, *USA Today*, the *Wall Street Journal* and *Business Week*... NBC’s *Today* show flew me to New York for an appearance on national television” (Peretti 2001). Peretti describes these events as revealing of the ways in which ordinary people with no major funds at their disposal can compete with the messages a corporation like Nike spends a billion dollars a year on (Peretti 2001).

4.5.1.2 Types of messages

The messages that Meireles suggests should be inserted into circuits should challenge the ‘anaesthesia’ spread by the circuit with ‘awareness’. As Meireles advocates, *Brinco* shoes carries a message that challenges the circuit in which it intervenes, and the complacency of the consumer: the embroidered message reveals the unpalatable conditions of the shoe’s manufacture. For *paraSITE*, Rakowitz made sure that homelessness should remain in the public eye, rather than removed from sight, so that the public could not succumb to ‘anaesthesia’ over the issue.

Wertheim worked with the language of the retail outlet, inserting her own branded product that is superficially similar, but which carries messages critical (or at least revealing) of the systems it takes part in. It is a visitation from unseen parts of the network of commodity production, from illegal immigrants and underpaid factory workers, intruding into the everyday space of the first world shoe store, challenging “the alienation inherent in industrialised capitalism” (Herkenhoff et al. 1999). Wertheim describes *Brinco* functioning

⁵ ‘Media artist’ refers here to an artist whose art form is the manipulation of the mass media.

partly as satire: she set up an imaginary narrative frame around the project, in which *Brinco* is “an pseudo American corporation that designs and fabricates a sneaker specifically to cross the Mexican/US border” (Wertheim in Borthwick & Greenberg 2007). In having the shoes made in China, she sees herself as “imitating the same manufacturing strategies and models of exploitation done outside the US in depressed economies by American footwear companies” (ibid).

Brinco could be read as satirising not just mainstream sneaker brands, but specifically ‘ethical’ products, of parodying the marketing practice in which products only carry information about the conditions of their manufacture if it is positive, as in the trend for ‘Fair Trade’ products, for example. “Products such as Worn Again sneakers (made from recycled materials and 100% recyclable in the United Kingdom) and the fair-trade No Sweat Mojo Sneaker have become an ethical alternative for consumers”, for example (Gill 2009, p.518). Rather than carrying information that distinguishes a product from other similar ones through its superior ethics and so justifying the purchase of this commodity over another, the *Brinco* shoe carries information about the unfairness of the systems that produced it. Rather than allowing the first world consumer to keep consuming by switching to another brand, placating their conscience, Wertheim challenges the systems that supply them on a more fundamental level.

While benefiting from these global networks through acquiring a cheap product, Wertheim simultaneously produces information that invites criticism of those networks. *Brinco* is both complicit and critical. “In a single object Judi reveals the contradictions between fashion, competition in the manufacturing industry, and migratory flows, themes that lie at the heart of the dynamics of labor geography in today’s world” (inSite_05 2005a). *Brinco* seems to express a “new approach” by contemporary artists in creating product-like objects in which “culturally determined want and rebellious agency are woven together”, as Jane Simon writes in *Return to Function* (2009a, p.19).

4.5.1.3 Redirecting benefits

Meireles made use of circuits in order to distribute messages through them. In *paraSITE*, we can identify Rakowitz as connecting to a physical ‘circuit’, the heating systems of buildings, in order to redirect this warmth and structure to the homeless, benefiting others through uses not anticipated by the circuit. *Brinco* too, we could identify as redirecting benefits within global circuits of goods, labour and capital, creating an imaginary alliance between the poor in different parts of the world: the workers in Chinese free-trade zones manufacturing equipment for Mexican workers to escape similar employment and cross the US border to

look for work. In this section, we extend Meireles' ideas, through Rakowitz' and Wertheim's work, to the redirection of benefits within circuits.

For *paraSITE*, Rakowitz identified an available resource – the waste hot air coming from buildings – and through “rerouting it” (Tiven 2007) used it to support his own temporary, parasitic structure. Rakowitz has worked with rerouting physical networks in other projects. In *Climate Control* (2001), he added his own ducting and fans to the existing radiator system at the PS1 Contemporary Art Centre in New York; in the same year his project *Rise* redirected an oven duct from a Chinese bakery into a 9th floor gallery in the same building, so that “upon entering the gallery, visitors were overwhelmed by the smell of fresh pastries” (Thompson & Sholette 2004, p.33). His concern here was both to reveal aspects of circuits in the way Meireles' would recognise: the work as a commentary on the tendency of artists and galleries to encroach on other socio-economic areas – the art system as a vanguard of gentrification – through reminding visitors of the labour taking place elsewhere in the building; and to benefit the Fei Dar bakery, directing gallery visitors to it as customers; “throughout the duration of the show, Fei Dar received a steady flow of customers who had visited the gallery” (Rakowitz 2001). Like *paraSITE*, this project was intended both to benefit a group under pressure and to draw attention to the forces threatening their wellbeing.

Artist collective Superflex, whose project *Supergas* was described earlier this chapter, also identify their role as to channel funds from the art world into social projects that benefit the marginalised: “being part of the art business has advantages... the artists can turn to the grants and awards available in the art world (in addition to the customary financial support for start-up enterprises)” (Superflex 2003, p.156). Their project *Guarana Power*, for example, saw them establishing a soft drink start-up company for Brazilian small farmers, marketed partly through gallery shows in the first world. We could frame their actions in terms of Meireles' proposals for insertions, as using their knowledge of the contemporary artworld to place projects into its circuits ‘disguised’ as art, in order to receive funding flowing within those circuits. This is made easier by the wide range of actions that the art world acknowledges as art, such as this type of tactical exploitation of systems – including the art world system itself.

4.5.1.4 Strange play with value

In a work exhibited by Meireles in 1969, shortly before he began his series of insertions, he exhibited “a package of one hundred one-cruzeiro bills... bound with rubber bands, as was the custom in banks”, titled *Arvore do Dinheiro (Money Tree)* (Barnitz 2001, p.282). The work “was marked for sale at two thousand cruzeiros, twenty times its monetary value” (ibid). In

this Meireles was pointing both to the high rate inflation in Brazil, which quickly rendered especially low denomination bills worthless, and “the commercial value of the art market” (ibid). This distortion of value according to an object’s place within a system is also the material of *Brinco*, in which Werthein demonstrated her ability to shift the value of her sneakers. Her mobility, and privileged access to markets as an artist, revealed the sometimes arbitrariness of both an object’s value and inter-country inequality: San Diego, where she sold the shoes for \$215, is only 15 miles from Tijuana, where she gave them away for free, some to people who had never owned a new pair of shoes before (Isackson 2005). Werthein identifies the tensions in this intersection of circuits of capital and labour, with *Brinco* relying on “the contradiction between free movement of goods and trade and the restricted movement of people... while capital and commodities flow relatively freely across borders, the movement of labour remains strictly controlled” (Borthwick & Greenberg 2007).

Meireles’ later work *Eppur si Muove (And Yet it Moves)* (1991) identified the strange play with value that can result in such global financial circuits. It highlights a contradictory feature of capitalism, a diminishing of value within global financial networks. He started with the sum of Canadian \$1,000, which was first exchanged into British pounds, and then into French francs. Over more than a hundred further transactions, the original capital was reduced through inevitable transaction fees and commissions to Canadian \$4 dollars and a few cents, which was then displayed, stored in a transparent piggy bank (Herkenhoff et al. 1999). “Instead of accumulation, the participant’s capital undergoes dissipation” (Herkenhoff et al. 1999, p.50). The project revealed the loss of value that can take place in acquisitive global systems in which goods and capital circulate, acting as “a form of inquest” that reveals “the devouring tendency of capital” (Herkenhoff et al. 1999, p.152). Where *paraSITE* showed the means for less powerful bodies to extract value from larger systems, *Eppur si Muove* demonstrated the ability of these larger circuits to leech value from goods moving through them.

4.5.2 ‘Critical vehicles’

Rakowitz started *paraSITE* while a student of the artist Krzysztof Wodiczko, working in his Interrogative Design Group (IDG) at MIT. *paraSITE* is clearly influenced by Wodiczko’s earlier project *Homeless Vehicle* (1987 - 88). This seminal project equipped homeless individuals in New York City with practical equipment that was also, like *paraSITE*, meant “to articulate the fact that people are compelled to live on the street and that this is unacceptable” (Wodiczko 1999, p.79). As with Rakowitz in Cambridge, Wodiczko was responding to efforts by the city of New York to remove the homeless from the streets, in this instance by forcibly

hospitalizing them under the assumption that any person choosing to live on the streets rather than in a shelter was mentally ill (ibid). Wodiczko noted the reasons some homeless people wanted to stay out of shelters:

Most city-run shelters – though they provide food and respite from the elements – are dangerous and unfriendly places that impose a dehumanising, even prisonlike, regimentation on residents. Guards routinely treat clients as inmates, allegedly denying them food for the violation of rules. Some shelter residents are bussed from place to place for food, showers, and sleep. Charges of violence by shelter security guards and clients are common (ibid).

Wodiczko noted that advocacy for permanent, safe and dignified shelter for all people is essential, and was being pursued – but he proposed to respond to their immediate needs at the same time (1999). His homeless vehicle looked somewhat like a missile, and was meant to represent the resistance of the homeless, opposing “the continuing ruination of an urban community that excludes thousands of people from even the most meagre means of life” (1999, p.83).



Fig 4.13: Krzysztof Wodiczko's *Homeless Vehicle* (1987 – 88)

Homeless Vehicle was part of a series of ‘vehicle’ projects by Wodiczko. He explained his concept of the ‘critical vehicle’ in his book of the same name:

The word *vehicle* is associated with the concept of a carrier. In some dictionaries, it is described as “a person or a thing” used as a medium “to convey ideas or emotions.” It is commonly understood as a means of transmission, display, and expression. The term *critical* suggests judgment, an act of pointing out shortcomings, defects, or error. It implies indispensability and an alarming or dangerous situation, as well as risk-taking. It denotes a point or state in which a change of properties or characteristics takes place—a

turning point or crisis that may demand an urgent response or action. A critical vehicle is, therefore, a medium; a person or a thing acting as a carrier for displaying or transporting vital ingredients and agents. It is set to operate as a turning point in collective or singular consciousness. It transmits those ideas and emotions that are indispensable to the comprehension of the urgency and complexity of a situation. In short, the critical vehicle is an “ambitious” and “responsible” medium—a person or piece of equipment—that attempts to convey ideas and emotions in the hope of transporting to each human terrain a vital judgment toward a vital change (Wodiczko 1999, p.xii).

We can interpret both *parasite*, which has a close connection to Wodiczko’s work, and *Brinco* – another “vehicle for discussion” (Isackson 2005) – as ‘critical vehicles’ by Wodiczko’s definition: functional objects that act as carriers or mediums for critical messages at the same time as they equip users.

4.5.2.1 Conveying issues

Both *paraSITE* and *Brinco* aim to communicate issues to audiences through the form of their objects or the actions they enable. Reading *paraSITE*’s form, the choice of materials for the shelter’s structure – thin, translucent – and the use of air to support it, imply fragility and temporality. The shelter is not an armoured parasite, clinging barnacle-like to the building, tenaciously resisting removal: the clearly visible ‘umbilical cord’ connecting shelter to building instead communicates vulnerability. It could be easily punctured or removed to cause the dwelling’s collapse. In this way, while the shelter communicates self-reliance as individual apparatus for survival, it also communicates dependence. It has the strange quality of communicating some characteristics of homelessness, its vulnerability, dependence, and reliance on the tolerance of others, at the same time as it seeks to ameliorate some of the conditions of homelessness: it communicates, even amplifies some qualities of the problem it is addressing at the same time as it acts against them.

Wodiczko’s description of his approach to design, which until 2006 was the declaration of purpose for the IDG, provides a more general program for the way *paraSITE* and *Homeless Vehicle* work:

A bandage covers and treats the wound while at the same time exposing its presence. Its presence signifies both the experience of pain and the hope of recovery. Is it possible to further develop such a bandage as equipment that

will communicate, interrogate, and articulate the circumstances and the experiences of the injury? Could such a transformed bandage address the ills of the outside world as perceived by the wounded? To see the world as seen by the wound! (1999, p.9)

paraSITE clearly performs some of this work in communicating and articulating the ‘circumstances and the experiences of the injury’ and exposing the presence of the problem. The project was intended to communicate to the public through its presence on the streets, to a wider audience through coverage in the press, and to policy makers, whom Rakowitz regards as the people who are the ‘real designers’ of the situation. In helping homeless people to stay in place, following their own agendas rather than the city’s, this equipment aims to capture ‘the ills of the outside world as perceived by the wounded’, rather than imposing external attempts to plan for them.

In rubbing up against the authority’s plans for the homeless, or allowing migrant workers to illegally cross the border, *paraSITE* and *Brinco* are in part antagonistic at the same time as ameliorative – antagonistic to authority while ameliorative to the user. Wodiczko advocates the friction such work creates as vital for the health of society, proposing art as a social irritant: the ‘helpfulness’ of hindrance. “If democracy is to be a machine of hope, it must retain one strange characteristic – its wheels and cogs will need to be lubricated not with oil but with sand” (Wodiczko 1999, p.xiii). His motivations are similar to Meireles’ purpose in making insertions: to disrupt the ‘anaesthesia’ of society. “My work attempts to heal the numbness that threatens the health of democratic process”, writes Wodiczko, “by pinching and disrupting it, waking it up, and inserting the voice, experiences, and presence of those others who have been silenced, alienated and marginalized” (ibid). The messages carried by critical vehicles are aimed at the apparently unaffected by social ills, who are “often unaware of the extent to which they were an active component – a vital cog or gear – in that machine” (Wodiczko 1999, p.xii).

The friction such approaches generate is also useful to attracting media attention. Both *Brinco* and *paraSITE* attracted attention in part through generating controversy (Antonelli 2005; Branding Democracy 2008). *Brinco* attracted attention in the US media because it appeared to condone illegality; *paraSITE* because it set itself in opposition to the approaches city authorities were taking to homelessness. Disrupting the normal running of society and causing people to pay more attention to its workings is a classic interventionist tactic. Generating controversy and antagonising at least some of one’s audience is one way in which a project can gain attention. Selling *Brinco* shoes as hip, desirable commodities was also a provocative

act: it amplifies the provocation in equipping people for an illegal act by portraying it not as a serious act of defiance, but by appearing to trivialize it, associating it with trendy first world youth culture: “the sneaker has been a staple of youth cultural expression... throughout the twentieth century” (Gill 2009, p.519). *Brinco* invites media attention by meeting pre-existing needs in the mainstream press for stories which excite public opinion by condoning illegality, appearing to make light of a serious issue, or by confirming the vapidness of youth culture and the immorality of contemporary art.

While much media attention focused on the controversy of equipping illegal immigrants, some articles in the press portrayed the distribution of shoes as a compassionate act. The BBC described Werthein giving shoes to a woman who had recently arrived in a migrant shelter in Tijuana. Catholic nuns run the refuge for women and children making their way north (Werthein is not the only person to pragmatically assist the poor in their efforts to cross the border). “After the 48-hour trip from her home in southern Mexico, Ms Elias’ trainers are ruined... Werthein gives her a pair of Brincos - and Ms Elias begins to cry. “I’m crying because you gave me these and almost no-one ever helps me,” she explains, adding that she has never owned new shoes before” (Isackson 2005). The needs of the press are also satisfied by ‘positive’ stories such as these, recording the emotion accompanying the distribution of personal equipment to the poor.

paraSITE and *Brinco* simply as novel functional objects, suggesting intriguing narratives, offer a certain attraction to the media. In surmising that *paraSite* may help audiences overcome “empathy fatigue”, the website Unhoused points to the pleasure that such novel, creative and concrete measures for equipping the vulnerable may engender (Unhoused 2007). Nato Thompson notes that “images of violence and exploitation that so often... move people to political action are conspicuously absent” from political art of the 1990s, including the work in *The Interventionists* (Thompson & Sholette 2004, p.14). “The symbolically charged image or overtly political text no longer feels adequate as a communicative device. Preaching is suspect” (ibid). This, she writes, is due to visual exhaustion caused by the relentless bombardment of images that the public experiences today, with “the increased privatization of public visual and social space” (ibid). In this glut of representation, functional objects communicating positive approaches to social issues (even if documented through images) stand out, in ways that textual or otherwise non-object-based advocacy does not. ‘Positive’ here means active, increasing agency: including antagonistic actions such as those enabled by *paraSITE* and *Brinco*; what is significant is that these project do not just ‘talk about’ issues, but offer people means to address them – even if, as the artists acknowledge, these are of limited impact.

4.5.2.2 Acknowledging limits to impact

Wodiczko invokes the temporariness of the ‘bandage’ in his object interventions, emphasizing their value as communication rather than on ‘solving’ the problem. He did not intend his *Homeless Vehicles* to substitute for advocacy or long-term solutions to the problem. Rakowitz and Werthein share this conception of limits to the direct impact of their work on social problems. Both Rakowitz and Werthein described their intentions for *paraSITE* and *Brinco* as to activate audiences and put pressure on policy makers, elevating this over the material impact of their projects. They do not frame their work as solutions to the large-scale problems with which they engage.

Such objects are not intended for mass-production. When asked how the design world has responded to his various *Homeless Vehicles*, including the *Poliscar* (which would form a mobile unit in a radio communications network for homeless people) Wodiczko threw back his head and laughed: ““The minute you present a proposal, people think you must be offering a grand vision for a better future.” They can’t see a thing like the Homeless Vehicle or the Poliscar as the “concretisation” of a present problem, a makeshift transitional device, or an aesthetic experiment. Instead, “they think it must be designed for mass production, and instantly imagine 100,000 Poliscars taking over the cities”” (Dunne 2005, p.87). Wodiczko describes his critical vehicles instead as “a combination of transitional objects and communicative artifices”, emphasizing the temporary nature of the object (transitional), as well as its communicative function (Wodiczko 1999, p.xiv).

Both Rakowitz and Werthein explicitly state the limits of their actions on the problems their projects address. *Brinco* shoes are designed to make the border-crossing easier for the wearer. While Werthein doesn’t comment on how effective they are for this purpose, or in raising money for a migrant shelter in Tijuana through the sale of the shoes, she denies that her project has an impact in encouraging immigrants to cross the border. The real incentive for illegal immigrants “is Americans’ demand for cheap labour” (Isackson 2005). Where she hopes her project has impact is broadly in stimulating debate about the issue of illegal immigration. Rakowitz points out that *paraSITE* is meant to push back against policies that attempt to remove the homeless from the public eye, without consulting them about their needs or preferences. It wants to return a technological answer to a social problem to the realm of debate. Both *Brinco* and *paraSITE* direct attention to higher-level authorities as having responsibility for large-scale social problems, and emphasise maintaining public awareness and debate over these issues as a means for addressing them.

4.5.2.3 A vehicle for the user

In designing equipment for marginalized groups, Wodiczko's objects are intended both to equip the user for action, and to provide them with a 'vehicle' for communication. In the first instance, he describes such objects as instruments that will "provide prosthetic devices, countermachines that empower the wearer, in cyborgian fashion, to survive and transform the conditions of his or her social existence" (Wodiczko 1999, p.xiv). In the second, his motivation for giving means of communication to the marginalized is that "Democracy is ill, silently suffering, and we must heal it, make it whole, of the wounds from hundreds of years of forced muteness and invisibility imposed on so many of its subjects" (Wodiczko 1999, p.xiii). His wish with his *Homeless vehicles* was to "open a dialogue between the homeless operator and the nonhomeless, and then to convey homelessness across the economic and social boundaries that divide the city" (Wodiczko 1999, p.xv).

Rakowitz described how the occupants of *paraSITE* shelters used them "as a station of dissent and empowerment", regarding them as "a protest device" (Rakowitz n.d.). They did not just shelter the user, but gave them a means of expressing their defiance to the authorities' plans for them. The shelters allow the user to keep doing what they were doing before, rather than asking them to conform to a new program. The shelters acted in other ways as a 'vehicle' for the user's expression. Each *paraSITE* shelter was made to express its user's personal preferences, within the general 'parasitic' form that Rakowitz originated. Rakowitz custom-made each shelter with a particular homeless individual. One homeless person was a Star Wars fan who wanted a shelter that looked like Jabba the Hut, for example; another wanted separate living areas for himself and his partner; one person wanted to display their belongings in pockets in the walls of the shelters (Rakowitz n.d.). Bill Stone "requested as many windows as possible, because "homeless people don't have privacy issues, but they do have security issues. We want to see potential attackers, we want to be visible to the public"" (ibid).

In working in this way, users participated in the design of their shelters, though conforming to the general design set out by Rakowitz: in using the same basic format for all the shelters (they are all inflatable, and need to be attached to heating ducts) Rakowitz retains the features of the shelter that unify the series and provide it's narrative symbolism. With their symbols of Mexican pride and preparedness for the border journey *Brinco* shoes are also designed to appeal to the wearer, and express their identity, though in a more general way: as a group rather than person by person. The sneaker is an apt 'vernacular form' for this purpose, which "has often functioned as a medium of individual or group expression through color or model

choice, or through customisation via shoelaces, drawing, or painting” (Gill 2009, p.519). Here again the form arrived at for *Brinco*, coming out of a period of local research by the artist, combines Werthein’s expression with some sense of the user’s. Like *paraSITE*, *Brinco* shoes facilitate the action already decided on by the user – to cross the border into the first world, piercing the barrier to resources on their own terms.

4.5 Summary

This chapter began by identifying instances where design for development and interventionist artwork intersect. Artists appropriate existing design for development objects for display in art galleries, and produce their own objects for use in the developing world or by vulnerable groups in the first world. Some interventionist art projects are exhibited in multiple forums, sometimes alongside design for development objects.

Contemporary work with functional objects can be described as the result of a trajectory from the appropriation of functional objects divorced from context, through to the synthesis of novel functional objects for use in the world, displayed connected to context when exhibited in galleries or museums. This is also a trajectory from representation through to intervention: though the functional, interventionist work examined in this chapter retains the means to communicate to audiences, especially the broader public. These objects are motivated by an activist urge to reveal the workings of systems in society and to give means of expression to the marginalised.

The main examples examined in this chapter are artworks that while broadly similar to design for development projects, operate in more critical ways, revealing negative features of the systems they engage with. While equipping the user, they agitate for public attention to the social issues they address, generating controversy and courting illegality as ways of getting their messages into the mass media. They conceive of their impacts as limited, and use tools and technologies as ways of bringing, or returning, issues to public debate. They demonstrate the possibility for groups that do not have centralised control of systems and networks to insert their own messages into them, and otherwise make use of their power, without necessarily sharing their values.

The next chapter examines ‘critical design’, a genre that borrows from the arts to produce part-fictional functional products designed to communicate to audiences; where this chapter documented art’s interest in design, the next chapter shows design looking into art.

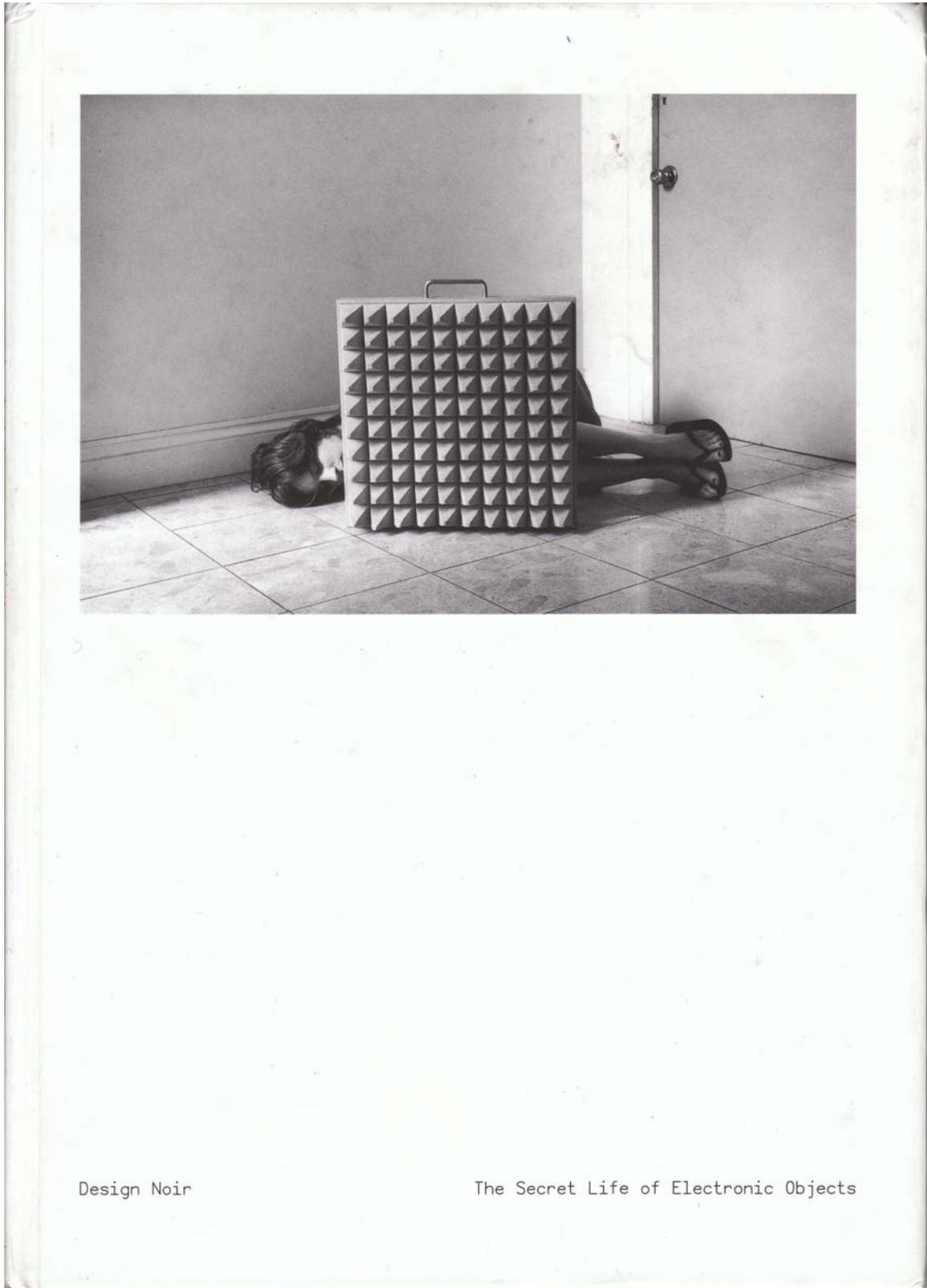


Fig 5.1: The cover of Dunne & Raby's book *Design Noir – The Secret Life of Electronic Objects* (2001)

Chapter 5

Critical design

Industrial design is not art, but neither is it purely a business tool. While mainstream industrial design is comfortable using its powerful visualization capabilities to propagandise desires and needs designed by others, thereby maintaining a society of passive consumers, design research in the aesthetic and cultural realm should draw attention to how products limit our experiences and expose to criticism and discussion their hidden social and psychological mechanisms.

Anthony Dunne, from *Hertzian Tales*, 2005, p.xvi

5.1 Introduction

This chapter investigates product design as a medium for social enquiry, a ‘critical design’ practice that questions the ‘affirmative’ or ‘productive’ stance of mainstream design. Where the previous chapter showed artists crossing into the territory of design, this chapter shows designers crossing into the territory of art, contributing to a blurring of the boundaries between the two arenas. While the ‘revolution in design’ proposed in ‘Chapter 2: Design for development’ identified the overly commercial focus of mainstream design and asked that it be directed instead towards developing world users and needs, critical design responds to the same observation by producing speculative products and scenarios of use intended to initiate discussion in first world publics.

The chapter documents a range of contemporary critical design projects and practices, focusing primarily on the work of designers and academics Anthony Dunne and Fiona Raby, who have led the field in formulating theories and vocabularies to define critical design as a practice. Other design practices related to critical design or under its broad umbrella are also described, such as some forms of ‘persuasive design’. Dunne & Raby’s work *Placebo project* and *Is this your future?* are analysed in detail to draw out their terminology, theory and practice of critical design.

These perspectives are established to produce a set of terms and theories that will help to frame some of the characteristics of design for development objects already observed, and to suggest alternative trajectories for design. These include the notion of ‘parafunctionality’, a

term which Dunne uses to describe the functions an object might have beyond its immediate use, and how this might be used as criticism; and ‘material tales’, a description of how product-like objects might act as characters in a narrative. Dunne and Raby question what needs product design caters to, introducing the idea of ‘complicated pleasures’ and the field of ‘design noir’ in which products might serve needs and desires that mainstream design ignores. They use the design of speculative products to stir debate around social and technological issues, stimulating the public to envisage ‘alternative nows’ and the consequences of new techniques and products.

5.2 Critical design

This chapter looks to research in ‘critical design’ to add to our understanding of objects produced both to communicate and perform a more immediate function for the user. Similar to the examples of interventionist art in the previous chapter, critical design objects combine instrumental function, or the suggestion of function, with the communication of social issues. Whereas that chapter documented work by artists looking into design, critical design has been led by industrial designers who have looked to the arts for models of practice. Critical design describes a form of product design as an imaginative and speculative arena for questioning our relationships to products and technologies. In it, objects tell stories of their imagined use, assisted by their designers’ presentation of accompanying scenarios showing, through video or photo documentation, human actors interacting with the objects.

The industrial designer, academic and head of the Design Interaction department at the Royal College of Art, Professor Anthony Dunne, coined the term ‘critical design’ in his book *Hertzian Tales - electronic products, aesthetic experience and critical design*, first published in 1999. Both Dunne and his partner Fiona Raby, together the design duo ‘Dunne & Raby’, look to the arts – film, literature and visual arts – to ask why industrial design could not join other more ‘conceptual’ design disciplines, such as architecture, in being more speculative and less directly tied to commerce, usefulness or a seamless integration into our lives. Noting that “product design’s strong ties to the marketplace have left little room for speculation on the cultural function of electronic products”, Dunne argues in *Hertzian Tales* that product design “has much to contribute as a form of social commentary, stimulating discussion and debate among designers, industry and the public” (Dunne 2005, p.xvi). “Whereas architecture and fine art often refer to popular culture, industrial design is popular culture” writes Dunne (2005, p.147).

In identifying industrial design as a medium for communication, Dunne & Raby's work resonates both with the use of commodities or 'vernacular objects' as mediums for communication to the public in interventionist artwork, as documented in the previous chapter, and with design for development's use of products to communicate to audiences, from *SUNNAN* lamps to *One Water* bottles. And in common with some of the motivations ascribed to design for development as 'a revolution in design', critical design shares its perception that mainstream twentieth century design is too led by commerce and industry, and not made capable of intervening in social issues (Dunne 2005). Dunne described this connection between critical design and design for development, as he saw it, in an interview I conducted with him in 2008. While Dunne felt that critical design as he and Fiona Raby practiced it was perhaps only possible in a first-world context, where basic needs are taken care of, there were some points at which he felt critical design and design for development might converge.

What might broadly link critical design and designing for the developing world, Dunne said, is this notion that they are both along a spectrum of responses to the urge to work outside of market-driven design. Taking *Design for the Other 90%* proposal that design should be motivated by the needs of the poor and not the market (at least not to the extent of designing for first world consumer goods markets), both critical design and design for the developing world present "an interesting opportunity to theorise a space outside of the market where design can take on additional roles" (Dunne 2008). At one end of this spectrum is more practical work such as design for the developing world, and at the other end the more imaginative and critical work Dunne undertakes with Raby (*ibid*). We can see this similarity between the concerns of critical design and the concerns of design for development in another interview with Dunne, in the booklet *Material Beliefs* (2009). There Dunne says that "critical design... rejects the idea that design can only exist in relation to industry and its narrow agenda, and it sets out to explore other ways design can contribute to society. Design can do so much more than help sell products by making them easy to use, sexy and desirable" (Beaver et al. 2009, p.64).

Where critical design and design for development diverge is in the way they respond to this largely shared perception; critical design is not about "problem-solving" as Bloemink describes design for development (2007, p.6), but 'problem finding', as Dunne & Raby propose in a manifesto they produced in 2009 (fig 5.2, next page).

(a)	(b)
affirmative	critical
problem solving	problem finding
design as process	design as medium
provides answers	asks questions
in the service of industry	in the service of society
for how the world is	for how the world could be
science fiction	social fiction
futures	parallel worlds
fictional functions	functional fictions
change the world to suit us	change us to suit the world
narratives of production	narratives of consumption
anti-art	applied art
research for design	research through design
applications	implications
design for production	design for debate
fun	satire
concept design	conceptual design
consumer	citizen
user	person
training	education
makes us buy	makes us think
innovation	provocation
ergonomics	rhetoric

Fig 5.2: *A manifesto*, Dunne & Raby, 2009, reproduced from their website at www.dunneandraby.co.uk

Column (a) represents the concerns of mainstream design practice; column (b) a critical design approach. Statements are twinned across the two columns: the first line contrasts ‘affirmative’ (design) with ‘critical’ (design); the second line ‘problem solving’ as a concern of affirmative design, ‘problem finding’ as a concern of critical design, and so on. The dialectic Dunne & Raby propose here indicates their scepticism regarding the ‘productive drive’ of design: what might it ignore in its desire to ‘fix’ the problem? Where mainstream design ‘provides answers’, critical design continues to ask questions. Critical design is not opposed to productive design, but maintains a sceptical approach to it, “developing a position which is both critical and optimistic” (Dunne 2005, p.xvi).

Dunne derived the term ‘critical design’ from ‘critical theory’, which seeks not just to describe the world but to change it. Critical theory, founded in the post-Marxist work of The Frankfurt School in the 1920s, has the project of analyzing society in order to reveal its workings, so that

people may take steps towards freeing themselves from exploitation; “as a social theory, critical theory “aims to give us knowledge of society: its structure and its dynamics and its lifeworld. . . [thus] enabling us to determine what our true interests are”” (Sumner 2003, p.3). Critical design involves “assessing the development of objects not against whether they fit into how things are now, but the desirability of the changes they encourage” (Dunne 2005, p.4). In *Hertzian Tales*, Dunne refers to a text by Raymond Geuss, describing critical theory as opposed to scientific theory, framing the work of critical design as activist and illuminating:

Scientific theories have as their aim or goal successful manipulation of the external world; they have instrumental use. If correct, they enable the agents who have mastered them to cope effectively with the environment and thus pursue their chosen ends successfully. Critical theories aim at emancipation and enlightenment, at making agents aware of hidden coercion, thereby freeing them from that coercion and putting them in a position to determine where their true interests lie (Dunne 2005, p.150).

In Dunne’s preface to the 2005 edition of *Hertzian Tales*, he notes that with few exceptions, and despite the ever-increasing role of electronic products in people’s lives over the intervening years since the book’s first publication in 1999, “design is [still] not engaging with the social, cultural, and ethical implications of the technologies it makes so sexy and consumable” (2005, p.xi).

Dunne & Raby’s work has appeared in many high-profile exhibitions. NY MoMA Design and Architecture Curator Paola Antonelli is a prominent supporter of Dunne & Raby’s work. Antonelli made ‘Design for Debate’, a term defined by Dunne & Raby (a variant of critical design) a section of *Design and the Elastic Mind* (2008), the next major show after *SAFE* at the NY MoMA. The exhibition described design for debate as “a new type of practice that devises ways to discuss the social, cultural, and ethical implications of emerging technologies by presenting not only artifacts, but also the quizzical scenarios that go with them” (New York MoMA 2008). This section of the exhibition focused on the work of Dunne & Raby and their students and colleagues from the Royal College of Art. Dunne & Raby’s earlier project *Faraday Chair* (1996), a personal shelter from the ubiquitous presence of electromagnetic waves in the home, from the series *Hertzian Tales*, was exhibited on *SAFE* at the NY MoMA in 2005, along with other design for development objects referred to in Chapter 2, and Rakowitz’s *paraSITE*. It is a precursor to their later work *Placebo project* (2001), one of the main examples analysed later in this chapter, whose concern is also with the presence of electro-magnetic fields in the home.

A practical iteration of Dunne & Raby's desire to work against the grain of mainstream affirmative design practice is their project *Park Interactives* (2000), a collection of 'adult furniture' installed in the public Medici Gardens in Rome. In contrast to the work of much orthodox urban design, as with the city of Cambridge's use of technology to deter the homeless from public space, described in Chapter 3: Art intervenes, here Dunne & Raby provide facilities for people's clandestine use of public space. It reflects Dunne & Raby's observation that "parks are strange places. During the day happy families play out idealised scenarios of modern life, while at night, they become sites for a variety of illicit activities. Our furniture will make some of these night-time activities more convenient and at the same time, offer a critique of the kind of design that is always trying to make things nice, convenient, user-friendly, efficient and ergonomic (especially public furniture)" (Dunne & Raby 2000).



Fig 5.3: *Bench* (left) and *Low Table and Hygienic Paper Roll* (right) from *Park Interactives*, 2000

The term 'critical design' has taken on enough life of its own that it is used beyond Dunne & Raby's work and way of defining it. PhD student at Nottingham Trent University Matthew Malpass writes that "critical design has since [Dunne] been adopted as an umbrella term for any type of design practice which suggests that design offers possibilities beyond solving design problems" (Malpass 2009b). Tony Parsons writes that "it has become a popular label for design that elicits debate" (Parsons 2009, p.144). Krzysztof Wodiczko's conception of 'Interrogative Design', and his work with 'critical vehicles', as discussed in the previous chapter, could be defined as a form of critical design that predates Dunne's definition; indeed Dunne includes Wodiczko as an influence on critical design in *Hertzian Tales*, referring to two earlier works by Wodiczko as "rare examples of how product design and the electronic object can fuse into critical design" (2005, p.63).

More recent examples of design that could be defined as 'critical' under Malpass' broad definition includes a product-design genre called 'design with intent', 'persuasive design' or

‘persuasive technology’ (Lockton 2009). These are products that resist, reward or otherwise attempt to modify the behaviour of the user. They could loosely be described as critical because they do not follow mainstream product design in seamlessly serving the user, and are not simply problem-solving: they explicitly aim to express societal norms and ethics, and may challenge the user in doing so.



Fig 5.4: *Flower Lamp* (left) and the *Power Aware Cord* (right), both from the Interactive Institute, 2004 - 2005

The exhibition *STATIC!* in 2004 – 2005, for example, by students at the Interactive Institute in Göteborg, presented prototype products that visualised their consumption of resources. The prototypes on exhibition attracted much media attention. *Flower Lamp*, which is described as “rewarding energy behaviours” by ‘blossoming’ in response to low energy consumption, was selected by *TIME* magazine as one of their Best Inventions in 2006 (Interactive Institute 2006). The project *Flow* aims to reduce people’s consumption of water through a complex system involved remote monitoring of a home’s water consumption and interactive television to provide them with “incentives and techniques to be more efficient with their water” (ibid). The *Power Aware Cord* is an electrical cable that pulsates with light to visualise the energy consumed by an appliance, to “inspire people to explore and reflect upon the energy consumption of electrical devices in their home” (ibid). Persuasive design could be seen as on the fringes of critical design, with a potential for commercial and everyday application. The *Power Aware Cord* has been licensed to an entrepreneur to produce as a consumer product (Power Products n.d.).

Adbusters magazine interpreted this type of design work as critical, including the *Power Aware Cord* along with a square toilet-roll by Japanese designer Shigeru Ban – his emergency shelters are included in *Design Like You Give a Damn* and on the exhibition *SAFE* – in an article titled

'Psychodesign'. Ban's toilet roll resists the user's tugging, releasing only a little paper at a time, so that "need is no longer met with silent compliance" (Nardi 2008). *Adbusters* had this introduction to the article:

Design has always submitted to our will. Design's immediate and unwavering compliance to our demands defines our relationship. It does what we ask of it. Any design refusing to conform to its purpose is discarded or rebuilt, its insolence ruled a defect or a flaw. But what if design stood up for itself? What if instead of bowing immediately to our demands, design gently pushed back?
(Nardi 2008)

Adbusters depicts mainstream design as overly compliant, framing it within their larger critique of consumer society that defines their agenda as a magazine. They see in these persuasive design prototypes a politicising of our relationship to consumer objects, disrupting our expectations of convenience and functional efficiency. The 'needs' of first world consumers, they imply, should be tempered and challenged, not acquiesced to, echoing some of the sentiment of 'a revolution in design' documented in Chapter 2.

While acknowledging the range of examples of 'critical design' work, which demonstrates Malpass' assertion that critical design practices are "increasing in examples... and exposure" (2009a, p.1) this chapter's main focus is on Dunne & Raby's particular formulation of critical design. They provide the most complex and well-formulated analysis of it as a practice. Two of their projects, *Placebo Project* (2001) and *Is this your future?* (2004) provide the basis for an exploration of their ideas.

5.3 *Placebo project*

Dunne & Raby describe their *Placebo Project* (2001) as "an experiment in taking conceptual design beyond the gallery into everyday life" (2001, p.75). They designed and made eight prototype devices that interact in a variety of ways with electromagnetic fields, and placed them in the homes of volunteers. Their intention was to investigate people's attitudes to and experiences of electromagnetic fields in the home (Dunne & Raby 2001). "Living with them for a while might encourage the user to think about their environment in a different way, especially in relation to electromagnetic fields" (Dunne & Raby 2001, p.75). Dunne & Raby have a particular interest in the invisible parts of the electromagnetic spectrum, into which electronic products spill. Some of the devices in *Placebo project* are intended to remind the users that "electronic objects extend beyond their visible limits" (Dunne & Raby 2001, p.78).



Fig 5.5: *Electro-draught excluder* (left) and *Electricity drain* (right) from *Placebo Project*, 2001

The name of the *Placebo project* suggests that the objects in the series are not all ‘functional’ in a scientific, rational way, but operate on the psychology of the user. *Electro-draught excluder*, for example, pictured in fig 5.5 above, is a small portable screen made of wood and conductive foam that is meant to block electromagnetic waves. But because it is not electrically grounded, it does not in fact do so. Dunne & Raby were interested in how it made the user feel, wondering if they would use it to shield themselves from particular appliances like the TV, and if it would make them feel more comfortable (2001).

The prototype *Electricity drain* is meant to drain excess electricity from the body. It is based on an existing vernacular practice; some people who feel they are hypersensitive to electricity use home-made devices to drain electricity from their bodies. “They wrap a piece of wire around their fingers which is connected to a plug that only has an earth pin”, that they plug in to a wall-socket to ground themselves (Dunne & Raby 2001, p.79). *Electricity drain* is also made to be plugged into a wall-socket. It has a mode of use playfully suggested by the form of the device; it is a low stool with a stainless-steel plate on top shaped like a cartoon pair of buttocks, and is intended to be sat on, naked, by the user.

Other devices in the series are: *Parasite light*, a lamp whose light intensity increases according to the strength of the electromagnetic fields it detects; *Nipple chair*, a chair with two vibrating

'nipples' set into the back-rest that vibrate against the user according to the strength of electromagnetic fields around it; *Compass table*, a table with 25 compasses embedded in its top surface, which move in response to the fields generated by electronic objects placed on it; *GPS table*, which has a global positioning sensor in it and a LCD read-out displaying its location; *Phone table*, a small lectern-like table which is "an attempt to domesticate the mobile telephone" – if a silenced phone is placed inside it, it glows when the phone is called; and *Loft*, a lead-lined box at the head of a ladder in which precious electromagnetically sensitive material can be kept ("answerphone messages, audio cassettes or floppy discs") (Dunne & Raby 2001, p.79)

The forms of the prototypes are minimal, rectilinear, and made from the same basic material: MDF, a processed wood. Dunne & Raby describe the form of the objects as "purposefully diagrammatic": like simple isometric diagrams expressed as objects (Dunne & Raby 2001, p.75). The minimal form of the objects in *Placebo project* emphasizes their status as design prototypes and experiments to express an idea, rather than multi-purpose appliances meant to blend in to rest of the house. Dunne & Raby have made fine choices about their use of materials. The electrical cord in *Electricity drain*, for example, is of the striped fabric-covered kind found on old clothes irons; this may make it more likely to be perceived of in the same 'family' as irons and cookers rather than hi-fi stereos, for example. The volunteer who took possession of the object liked this because she said it gave it the feeling of an appliance – "I wouldn't have liked it so much if it was just all plastic coating" (Dunne & Raby 2001, n.p.).

Dunne & Raby found volunteers for the project by placing notices in magazines, newspapers and public places. As part of a selection process, volunteers filled out forms "detailing any unusual experiences with electronic products, their attitude to electromagnetic waves and their reasons for choosing a particular object" (Dunne & Raby 2001, p.75). When their period of time living with the objects was up, the volunteers were interviewed and they and the object photographed in their homes. Their interview questions included asking how the volunteers used the objects, what room in the house they kept it in, how they described it to their friends, where they might imagine such a product might be sold if it was 'real', and if the project made them think differently about electromagnetic waves.

The volunteer who took the *Electricity drain* was what Dunne & Raby refer to as an 'electro-sensitive' (2001): she felt affected by electromagnetic waves and static electricity. When she was using her mobile phone, her fillings hurt. She felt that placing her hand on the *Electricity drain* increased the amount of time she could spend on the phone without pain. She used it to drain static from nylon items when she was ironing. She also imagined it working passively in

the room by itself. “I imagined it sort of quietly working away like a bunch of flowers... something going on, something quite beneficial, very gentle, but you don’t necessarily know. That’s how I imagine it” (Dunne & Raby 2001, n.p.). She was self-reflexive about her perception of the effects of the device, telling Dunne & Raby that she was “quite happy to go sit there and put my hand on it while I was on the phone... despite the fact that I wasn’t really sure whether or not it was working... I certainly found it to have a beneficial effect, even if it was very slight”(ibid). She agreed with Dunne & Raby that it was “a good placebo object” (ibid).

The volunteer who took charge of the *Electrodraught excluder* conceived of it as “symbolic protection” (Dunne & Raby 2001, n.p.). In her interview with Dunne & Raby she moves back and forth between thinking of it as ‘actually’ protecting her from electromagnetic waves, and serving other more symbolic functions, such as giving her a way to create her own personal space (ibid). In the first week that she had it, it made her feel less safe because she became much more aware of all the electronic objects in the house. She had already been aware of public concern over the increasing presence of electromagnetic waves in the environment, but having this object made her more conscious of it. She regarded the object as working well as “an imaginative object”, and less well as “a useful object”: she could imagine an object that was more pragmatically designed to shield the user from electromagnetic waves (ibid). She told Dunne & Raby that she hadn’t expected to find that it would make her feel more insecure in her home. “You just assume you get this protective thing and you’d feel protected. I didn’t really think you could have something in your house that just made you much more sensitive to things” she said. “I think I found it quite emotionally and intellectually tiring and wearing to use after a while” (ibid).

Dunne & Raby point out that “designers cannot always solve problems”; they cannot for example “switch off the vast electromagnetic networks surrounding us all” (2001 p.75). With *Placebo project* they intend instead to experiment with ways in which they as designers can change people’s perceptions of the world. Like a medical placebo, these devices might comfort people even though do not actually work to protect them from electromagnetic fields; they also encourage the user to become more aware of the presence of electromagnetic waves in their environment. They like the idea that these products might be made available for rent, “like a book or a video”, “providing a service in the form of a reflective experience” for a limited time (ibid). As one-off items they would be “prohibitively expensive” to buy, and even if made affordable, are not intended to be items for long-term use. The *Placebo project* is not intended to “make it into ‘reality’, at least not through the commercial marketplace” (ibid).

5.4 *Is this your future?*

In 2004 Dunne & Raby were commissioned by the Science Museum in London to explore possibilities for energy use in the future, for a show in the Energy Gallery directed at children aged 7 to 14. For *Is This Your Future?*, which they describe as a “Critical Design experiment”, Dunne & Raby designed a range of “hypothetical products” based on technologies for generating energy that already exist but are not in widespread use (Dunne & Raby 2004). Working with photographer Jason Evans, with whom they collaborated on *Placebo project*, they produced a number of stylised photographic scenarios showing these products in use.

The Science Museum wanted Dunne & Raby to communicate the speculative nature of envisaging the future use of technology. “One of the main messages the museum wanted to put across”, Dunne noted, “was that in the past it’s been impossible to predict the future of energy. They told us that many predictions had been wildly wrong” (Moggridge 2007, p.603). Dunne & Raby produced three different visions of the future of energy to underscore the fact that the scenarios were speculative rather than accurate predictions. Dunne & Raby found the future technologies already presented by the museum too directed towards hydrogen and hydrogen cars (Moggridge 2007), perhaps the most ‘realistic’ idea for a future energy source around the time of the exhibition.

The energy sources they built scenarios around were not chosen because they are the most realistic or most likely. *Blood/Meat Energy Future*, in fig 5.6 below, in which the use of domestic appliances that run on blood and meat is imagined, is described by Dunne as “probably the most unlikely scenario of all” (Moggridge 2007, p.605). The children in this scenario are feeding mice they have reared to a TV set that consumes them as fuel. The yellow cube and teddy bear-shaped object in the centre foreground is a radio that runs on blood (see detail in fig 5.6 below). Dunne & Raby based this scenario on a meat-eating robot they heard was in development at the University of South Florida, called ‘Chew-Chew’ (Moggridge 2007). Chew-Chew is designed to ‘eat’ slugs, using their flesh as fuel for bacteria to break down within microbial fuel-cells. Dunne & Raby describe their imaginations as ‘sparked’ by this information. What would it mean for society if flesh and blood were used as fuel? “Would humans and animals be exploited in new and horrible ways? Or would laws be passed to protect them?” (Moggridge 2007, p.605).



Fig 5.6: *Blood/Meat Energy Future* (left) and *Hydrogen Energy Future* (right) from *Is this your future?* (2004).

Creating apparently mass-produced products for these future scenarios offers the viewer props with which to imagine these futures as ‘real’, in which these technologies are already embedded in society. They hint at larger social and technical systems at work of which these products are a concrete manifestation. One of the props from the *Meat/Blood Energy Future* is a ‘book for parents’ titled ‘Animals as Energy – Avoiding emotional attachment to animals purchased for use as energy’ (see fig 5.7 below). For *Human Poo Energy Future*, in which human biological waste is so valuable an energy source that today’s taboos about faeces are overcome, they produced a ‘poo lunch box’ for children to bring their faeces home from school (see Fig 5.7 below). These physically realised though non-working, ‘hypothetical’ products provide detail in these near-future speculations. Dunne & Raby also describe themselves as using “the language of design to make [these futures] more friendly and acceptable” (Moggridge 2007, p.605). Rather than prejudging the *Meat/Energy Future* for the viewer from the perspective of today – for instance emphasizing the ghoulishness of using flesh and blood as fuel – Dunne & Raby present this future less didactically, projecting us into a society in which this is already accepted. “There’s room for interpretation” Raby says, “That’s exactly what we’re interested in” (Moggridge 2007, p.595). It is also possible that depicting a future in which the use of flesh and blood for fuel is normalised and catered to by child-friendly, ‘cute’ products is ultimately

more sinister than one which emphasises its grotesqueness. And the child in the foreground of the photograph does look rather forlorn as he contemplates an empty cage, while his more resolute sibling drops its occupant into the TV to be eaten.



Fig 5.7: *Book for Parents* (left) and *Teddy bear blood bag radio* (centre) from *Blood/Meat Energy Future*. *Poo Lunch Box* (right) from *Human Poo Energy Future*.

The scenario *Hydrogen Energy Future*, in Fig 5.6 on the previous page, imagines a future in which families take responsibility for domestic hydrogen production, with each household operating as “competitive producers, competing against their neighbours and needing to market their company and family brand” (Moggridge 2007, p.607). Children are depicted as workers for the family: props for this scenario include a contract in the form of a birthday card that children receive on their eighth birthday, that “commits them to producing a certain amount of hydrogen every week” (ibid). Parents and children wear uniforms bearing their family’s logo. The appearance of the actors in this photographic scenario is stiff and dour in comparison to the other future scenarios in the series. In *Meat/Blood Energy Future* and *Human Poo Energy Future*, their technologies are depicted as normalised into a fairly familiar first-world consumer society. In *Hydrogen Energy Future* the society depicted looks more totalitarian and dystopian.

While the social effects of the *Meat/Blood Energy Future* are left largely to the viewer to judge, the social effects of the *Hydrogen Energy Future* are made more explicitly the subject of this scenario, looking at “how over-competitive parents might exploit their children, a return to child labor” (Moggridge 2007, p.607). Perhaps because hydrogen was the energy source already depicted as most ‘realistic’ by the Science Museum, Dunne & Raby instead of dwelling on its technology introduced ways of thinking more critically in terms of its possible social effects, “showing that technology does not always bring out the best in people” (Moggridge

2007, p.607). Dunne & Raby based the scenario not just on technology, but on texts that describe new social and economic structures for energy production. They used the book *The Hydrogen Economy*, by Jeremy Rifkin, which “suggested that energy production could be decentralised. Energy consumers could become energy producers, and local communities could produce their own energy” (ibid). As evidence perhaps of the contrarian tendency of critical design, Dunne & Raby imagined instead of utopian decentralised co-operation and autonomy, the possible negative social effects in encouraging competitiveness between households that could result, including the effect within the family of increasing children’s responsibility for energy production. This could also be interpreted positively, Raby points out, as an ethical stance making children “aware at a very young age of their energy liabilities, how each one of us, individually, needs to take on some responsibility” (ibid).

In each of these three future scenarios, the intention is to inquire into the social, cultural and ethical values that might change as a result of new technologies. The scenarios focused on the social impact these futures might have on the life of a child, and were meant to capture the imagination of children (Moggridge 2007). The hypothetical products within each scenario served as objects for a kind of ‘future archaeology’, in which we are invited to imagine the lives of people from their artefacts. Having these artefacts use the forms of apparently mass-produced products speaks to contemporary audiences in a familiar language – industrial design is popular culture, as Dunne refers to it – and implies how embedded in a larger social and productive order new practices must become. The objects are both familiar, in a formal language contemporary audiences recognise from the world of products around them, and strange, serving odd functions.

5.5 Discussion

This section discusses *Placebo project* and *Is this your future?*, drawing on terms and ideas proposed by Dunne and Raby, particularly Dunne’s book *Hertzian Tales* and their co-authored book *Design Noir*. The discussion is grouped under the headings ‘Para-functionality’, which describes ways in which the function of an object can be crafted as criticism, including Dunne’s proposal for ‘post-optimal objects’, and his identification of ‘the gadget’ as a particular example of para-functionality; and ‘Material Tales’, which discusses the way critical design objects can act as characters in a narrative. Through creating objects and depicting them in scenarios of use, Dunne suggests that we can create critical stories that “blur the boundaries between the real and the fictional, so that the visionary becomes more real and the real is seen as just one limited possibility” (2005, p.84).

5.5.1 ‘Para-functionality’

Dunne in *Hertzian Tales* defines ways in which the function of an object, not just its form, can be crafted “to provide new types of aesthetic experience” (2005, p.xviii). This could be referred to as the ‘para-functionality’ of an object. Para-functional objects, Dunne writes “are simply stories, but stories that allow complex interactions between reality and imagination... When these props are introduced into everyday life as a “virus”, subverting it, people can participate in the story, exploring the boundaries between what is and what might be. This is the role of the para-functional as criticism” (2005, p.67). “The prefix “para-” suggests that such design is within the realm of utility but attempts to go beyond conventional definitions of functionalism to include the poetic” (Dunne 2005, p.43).

How do the objects in *Placebo project* and *Is this your future?* function? The objects in *Placebo project* work in a range of ways. As a functional object, *Electricity drain* ‘works’ in perhaps the most straightforward or traditional way: plugged into the earth circuit of the electricity grid, it really should, and does, drain stray electricity from whatever is placed on its metal surface. When its volunteer user placed her ironing on it, it drained static electricity from the clothes. But the other ways in which the volunteer used it departs somewhat from objective ideas of functioning: her perception that it reduced the pain she experienced from mobile phone calls, or that “you plug it in and everything in the room has been absorbed” for example (Dunne & Raby 2001, n.p.). As the volunteer herself was aware, these functions of the object were at least partly in her imagination: “You know, something going on, something quite beneficial, very gentle, but you don’t necessarily know. That’s how I imagine it” (ibid). *Electricity drain* drains electricity from objects in direct contact with it, but also works in more subjective ways according to the perception of the user: in the case of this volunteer, it lessened the feelings of discomfort that she attributed to electromagnetic radiation, and appeared to her to be generally beneficial.

Electrodraught excluder works almost entirely on the subjective level. Dunne & Raby acknowledge that it cannot really block electromagnetic waves; they were interested in how its user would respond to the suggestion that it did. Its effect on its volunteer user was less palliative, and more anxiety-provoking: it worked to raise its user’s awareness, and fear of, electromagnetic radiation. The other objects in *Placebo project* are distributed along a range of objective and subjective functions, or of working and not working: user interviews showed that objects like the *Parasite light*, though intended to function in a particular way (to brighten in the presence of electromagnetic waves from electronic products) only partially worked – it

didn't light up with a variety of electronic products its users placed on it, though it did, ironically, light up when an ordinary lamp was placed on it. The owner of the *Nipple chair* recounted a mixture of frustration and pleasure in the object's unpredictability of function: it worked, but not all the time (Moggridge 2007).

Objects such as these which might frustrate the user are the result of the space which has opened up for designers to produce 'post-optimal' objects, Dunne proposes: with technical efficiency now easily achieved for many technologies, attention can be paid to 'poeticising' their mode of interaction with the user. The challenge for designers lies now "in the realms of metaphysics, poetry, and aesthetics, where little research has been carried out" (Dunne 2005, p.20). "If user-friendliness characterizes the relationship between the user and the optimal object, user-unfriendliness then, a form of gentle provocation, could characterize the post-optimal object" (2005, p.xvii).

In most cases, *Placebo project's* volunteers reported that their adopted objects raised their awareness of electromagnetic waves in the environment, and felt a variety of other subjective feelings from or for their objects: both the adopter of the *Nipple Chair* and the *GPS table* saw their objects as alive or aware in some way. The *GPS table* adopter described seeing it "as a pet, in a way" (Dunne & Raby 2001, n.p.). When the table was indoors, it would often lose contact with any satellite, and its LCD display would read 'lost'. This caused its adopters to feel concerned for it, as for a lost child (ibid). The emotional response it created causes Dunne to see this as part of the work of the object. "Some people see that as a weakness in the design – that really it should be able to communicate all the time and give its position, but we see that as its function, because by being lost, it asks the owners to help in some way" (Moggridge 2007, p.599). Lack of predictability or efficiency in the objective functioning of the object doesn't preclude other ways in which the object 'works' on more subjective levels for the user – or for Dunne & Raby, as a tool for their research into post-optimal objects.

While directly engaging their adoptive users in a variety of ways, *Placebo project* is also meant to be read by audiences beyond the user, through the project's exhibition in galleries, through the book *Design Noir*, through Dunne & Raby's website, reports in the press and in other publications. This is another function of the project, to stimulate thought and feeling in a wider audience. *Is this your future?* takes place almost entirely on this level, its function to communicate to audiences, both immediately in the Energy Museum (with children as the primary audience) and through secondary publications. The human characters depicted in its photographic scenarios are not real users of the objects, but actors. The objects themselves are mostly not functional in a traditional sense; they are not intended to be used in real-life,

and most cannot perform the actions they are depicted doing. True, the *Poo lunchbox* is no doubt capable of holding poo (as any lunchbox could) though as far as we know it has not been tested in this way; but the TV set does not really run on mice, or the radio on blood. These objects are much more like props than the objects in *Placebo project*, and their function more exclusively to generate discussion in audiences (rather than users) around their contexts of use.



Fig 5.8 Jack Kevorkian with his *Thanatron*, in an image commonly available online, attribution not found.

Further to his and Raby's work in producing para-functional objects in projects such as *Placebo project* and *Is this your future?*, Dunne also identifies real world examples of para-functionality. He offers Jack Kevorkian's *Thanatron*, or *Suicide Machine*, a device to assist suicide through the self-administration of a series of drugs (see fig 5.8 above), as an example of a 'real life' design with some of the attributes of 'para-functionality'. It expressed Kevorkian's resistance to laws preventing euthanasia, not just as commentary, but as a functional object which he used to help some 130 terminally ill patients to commit suicide. "Critical of a legal system that outlaws euthanasia, Kevorkian has his machine to overcome this" (Dunne 2005, p.43). Dunne calls the *Thanatron* "a powerful "unofficial design" that materializes complex issues of law, ethics, and self-determination, [the *Thanatron*] shows how an industrial invention can be a form of criticism"(ibid). "Its ambiguous status between prototype and product makes it more disturbing than pure artworks by blurring boundaries between the everydayness of industrial production and the fictional world of ideas. It suggests a role for design objects as discourse

where functionality can be used to criticize the limits that products impose on our actions” (ibid).

A particular type of para-functional object that Dunne identifies in the real world is ‘the gadget’, “a curious, original and witty accessory of no real use” (2005, p.50). In contextualising *Placebo project* in *Design Noir – The Secret Life of Electronic Objects* (2001), Dunne & Raby draw attention to popular public fascination with the ‘netherworld’ of mail-order catalogues and home-shopping TV channels, which sell novel objects promising incredible, often multiple functions. Dunne quotes the designer Giulio Ceppi in *Hertzian Tales*, who argues that “the most important phenomenon caused by the gadget is... a psycho-behavioural factor: wonder... The fact that wonder and surprise are two variables that rarely enter into the design of industrial objects has induced the development of a clandestine niche in which such forbidden emotions can be found” (2005, p.50).



Fig 5.9: Classic *chindogu*. floor mops attached to cats and babies.

In *Hertzian Tales* Dunne refers to a Japanese subculture or hobby form called *chindogu*, which “literally means an odd or distorted tool – a faithful representation of a plan that doesn’t quite cut the mustard... they are products that we believe we want – if not need – the minute we see them. They are gadgets that promise to give us something, and it is only at second or third glance that we realise that their gift is undone by that which they take away” (Dunne 2005, p.151). *Chindogu* frequently make use of ‘waste’ energy – such as mops that attach to a cat’s feet, or to a baby’s clothes, as in the examples in fig 5.9 above. While they offer the allure of getting something for nothing, a second glance reveals why they would not really work in the way intended. They occupy a space somewhere between a visual joke and a design proposal, or a story told with an object: Dunne describes the meaning of *chindogu* as “derived from ‘sense-fiction’: the objects make functional sense, but are still useless” (2005, p.45).

5.5.2 ‘Material tales’

References to narrative are woven through Dunne & Raby’s work. The title of *Hertzian Tales* refers to stories; their book-title *Design Noir* refers to the ‘noir’ genre of film and literature. Dunne relates the “constructive user-unfriendliness” of the post-optimal object to poetry, which does not necessarily have transparency and ease as its defining characteristic; everyday speech is informative and instrumental, literary language not necessarily so (2005, p.35). “User-unfriendliness does not have to mean user-hostility. Constructive user-unfriendliness already exists in poetry” (ibid). In modern literature the foregrounding of language, and the work it may require of the reader to access its meaning is well established. Dunne describes this foregrounding as “where writing itself is a gadget in that it celebrates the workings of language” (2005, p.52), and asks “what happens when this sensibility moves from the page... to become part of everyday space?” (2005, p.53). The critical design project is framed from the start of *Hertzian Tales* as a desire to extend product design into the realm of the arts, including film and literature. Real-fiction “discusses systems of presentation and consumption for ideas that, unlikely to be mass-produced or even prototyped, exploit the conceptual status of objects as ideas” (Dunne 2005, p.xviii).

Placebo project was designed “to elicit stories about the secret life of electronic objects” (Dunne & Raby 2001, p.75). Designing objects that are “open-ended enough to prompt stories” (ibid), placing them in real people’s homes and recording their interactions with the objects over time is something like a form of theatre in real life. Some of the objects in *Placebo project* were perceived of by their adopters quite literally as characters, with personalities and agency, as described earlier. The objects act as characters in a narrative generated by the object in collaboration with their users and designers. Dunne imagines “..the user as a protagonist and co-producer of narrative experience rather than a passive consumer of a product’s meaning” in encountering critical design objects (2005, p.69). Dunne uses the term ‘real fiction’ to refer to the challenge with conceptual and critical design “to blur the boundaries between the real and the fictional, so that the visionary becomes more real and the real is seen as just one limited possibility, a product of ideology maintained through the uncritical design of a surfeit of consumer goods” (2005, p.84). There is an implicit connection to critical (as in social) theory in this identification of the historical construction of the present moment, and in critical (as in literary) theory in the emphasis on an active reader who ‘co-produces’ the text with the writer.

Dunne refers to such story-generating objects as ‘material tales’ (2005). Dunne & Raby’s conception of ‘design noir’ is a particular kind of material tale, “where electronic objects co-star in a noir thriller” (2001, p.6). *Faraday chair* is a material tale, as Dunne describes it, in that it suggests a narrative in which it is a character. The viewer imagines a person using the device - “modelling a scenario of use in the mind” - and is invited to deduce their motivation and other features of their life around this object. The objects in *Is this your future?* are presented within stylized scenarios, narrative fragments. *Is this your future?* is an application of critical design to future forecasting, though Dunne and Raby stress the difference between the mainstream of future forecasting, which usually reflects the status quo, and their work envisaging the future. In their 2009 manifesto they contrast ‘science fiction’, in the affirmative design column (a), with ‘social fiction’ in the critical design column (b): while their work imagining future artefacts has some things in common with science fiction, which typically involves imagined future technologies, their emphasis is on imagining the social effects of new ways of doing things in the future. Dunne identifies envisaging the future as possible work for designers, referring to Italian modern designer Ezio Manzini, in *Hertzian Tales*:

..Ezio Manzini outlined a role for the designer that offers a fresh perspective that builds on earlier Italian design thinking. He suggests that the days of the design visionary are over, and a weariness with utopian visions has set in. Instead, he advises the designer to use his or her skills to visualize alternative future scenarios in ways that can be presented to the public, thus enabling democratic choices between the futures they actually want. Designers could then set about achieving these futures by developing new design strategies to direct industry to work with society. (2005, p.xvii)

Design’s role in presenting narratives becomes a way of democratizing technological development; the designer as story-telling intermediary between industry and society. The urban designer Nels Janssen, for example, applies critical design to urbanism, describing it as “going back and fro between the present and the future state of the environment.” His paper “Critical Design in Urbanism” positions critical design “as a ‘go-between’ between ‘designerly thinking’ and ‘utopian thinking’”(Janssen, 2008). In my interview with him, Dunne referred to Stephen Duncombe’s book *Dream: Re-imagining Progressive Politics in an Age of Fantasy* (2007), in which “the author talks about [the] space between reality and the impossible” (Dunne 2008). If the designs are too “idealistic or fantastical, people dismiss it as completely and utterly impossible... I think Fiona and myself like to position our work closer to the impossible and

try and make it feel like the reason it's impossible isn't technological, it's social or political or economic or to do with mind-sets" (ibid).

These 'material tales' are not utopian visions or blueprints – clear-cut modelling of the future is too didactic. Instead, they mix criticism with optimism to provide the "complicated pleasure" found in other imaginative media such as film and literature, particularly those that explore boundaries between the real and the unreal (Dunne 2005, p.xvii).

In this passage from *Hertzian Tales*, Dunne identifies the mix of optimism and criticality which also characterizes *Is this your future?*, and with which Dunne and Raby contrast their work to mainstream designer visions of the future. "Corporate futurologists force-feed us a 'happy-ever-after' portrayal of life where technology is the solution to every problem. There is no room for doubt or complexity in their techno-utopian visions" (Dunne & Raby 2001, p.6). Critical design projects "ask questions rather than provide answers and should stimulate discussion in the way a film or novel might" (Dunne 2005). Dunne mobilises the term "complicated pleasure" to refer to the pleasure to be found in the more ambiguous situations he and Raby create, comparing it to the pleasure found in imaginative media like film and literature, which can be ambiguous, shocking, saddening, brutal, tragic and so on. This is in contrast to mainstream design that caters mainly to positive emotions. Some of the objects in *Placebo project* for example caused anxiety in their users, and some aspects of the futures envisioned in *Is this your future?* are disturbing, while other aspects are more familiar or reassuring.

I read Dunne's use of the term complicated pleasure to mean both the 'pleasure' experienced by the reader through the evoking of emotions that may not be commonly understood as pleasurable, like anger, uncertainty, fear, anxiety; and also the pleasure offered by 'difficult' texts that require an active reader to decode it. Dunne refers in *Hertzian Tales* to playwright Berthold Brecht and his development of 'alienation' and 'estrangement' as techniques in theatre in which the viewer is forcibly reminded of the artifice of the play rather than seduced into believing in its fictional world. Brecht's technique of alienation was intended to make audiences aware of the constructed nature of social and political structures, of the way social reality itself is staged and performed, to "make them aware that the institutions and social formulae they inherit are not eternal and natural but historical, man-made, and so capable of change through human action" (Dunne 2005, p.36).

5.6 Summary

This chapter introduced critical design, a form of product design as criticism whose definition and practice has been led mainly by Professor Anthony Dunne and Fiona Raby. Critical design can be linked to the concerns of design for development, as Dunne proposes, in that both are responses to the narrow concerns of mainstream commercial design. But where design for development looks to extend design's services to a new set of clients, critical design questions the productive or affirmative stance of design in more fundamental ways.

In critical design, design is not just about 'problem solving', but is used to create speculative, functional objects that stir debate on social issues. Critical design, drawing on critical theory, and like Wodiczko's 'Critical vehicles', aims to reveal the workings of systems of power in society. In using industrial design as a popular medium for communicating to publics, critical design offers another perspective on design for development's use of objects for advocacy.

The chapter documented examples of Dunne & Raby's work, as well as other genres of product design that could fall under the broad umbrella of critical design, including forms of 'persuasive design', which, like critical design, may frustrate the intentions of the user. Dunne identifies this possibility for creating 'poetic' interactions between users and objects as a result of the space opened up by the 'post-optimal object' – now that instrumental functionality is quite easily achieved, other more provocative functions can be designed for. He identifies 'para-functionality' as the quality objects can take on when using function as a form of criticism.

These characteristics were located in Dunne & Raby's *Placebo project*, as well as in the real world, through objects such as Jack Kevorkian's *Thanatron*, the hobby form of *chindogu*, and other 'gadgets'. Dunne & Raby's project *Is this your future?* was presented as an example of their use of critical design to create fictional tableaux which mix optimism and scepticism to create part utopian, part dystopian 'material tales' about the future of technology. A concern with narrative runs through their work, looking to the arts, film and literature for ways to cater to the 'complicated pleasure' of users and audiences, rather than provide the seamless user-friendliness assumed by most commercial design.

The next chapter examines a real world example of the interaction of people and functional objects over a social issue: the struggle of the activist Anti Privatisation Forum (APF) in South Africa against the imposition of a divisive technological object in poor communities.

DESTROY THE METER / ENJOY FREE WATER

Johannesburg Water has introduced prepaid water meters in 1,389 households in Stretford extension 4, Orange Farm. This was a pilot project to the installation of the same meters in townships surrounding Johannesburg as part of the water company's Operation Gcin'amanzi, the largest prepaid meter project in South Africa. This booklet looks at the impact the prepaid system has had on the lives of people living in Stretford and offers compelling evidence for why this technology violates the basic right to access water, and why it should be rejected.



Researched & published, June 2004, by the Orange Farm Water Crisis Committee, Anti Privatisation Forum and the Coalition Against Water Privatisation.

Fig 6.1: The back cover of a pamphlet titled *Destroy the Meter/ Enjoy Free Water* (2004), published by the Anti Privatization Forum (APF) and affiliates.

Chapter 6

Antiprograms

...I will outline and illustrate two ways in which artifacts can contain political properties. First are instances in which the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in the affairs of a particular community...

Langdon Winner, 'Do artifacts have politics?' (1986), in *How Users Matter - The Co-Construction of Users and Technology*, 2003, p.28

6.1 Introduction

This chapter examines the actions of the Anti Privatization Forum (APF), an activist organisation in South Africa, in opposing the installation of 'prepaid' water meters in poor communities. Prepaid water meters, as opposed to bill-paid water supplies, only release water on payment. They are part of the South African government's drive for water privatization and 'cost-recovery' in the delivery of public services.

The APF reconnects the water supplies of households cut off for non-payment, and removes prepaid water meters as an act of civil disobedience. Their actions, which combine connecting people to resources with public protest, parallel the other examples in this thesis of objects which function both immediately for the user and in communicating to audiences. Operating in the same geographical region as the *PlayPump*, and with the *PlayPump* and the prepaid meter both supported by the South African government, examining the APF offers another perspective on the role of objects and actors in water supply in the developing world.

The chapter first notes what mention there is in design for development forums of informal actions by which the poor in the developing world may access resources. While some informal actions are celebrated, the type of illicit action taken by the APF is largely left out of narratives in this field (in fact it is the prepaid meter which bears more of a resemblance to a design for development object). Illicit actions by the poor in the developing world *against* technological means of 'development' undermine the simplistic image of gratitude and overwhelming need promoted by objects like the *PlayPump*, illustrating how some measures at development might be greeted with suspicion – especially private sector involvement in providing public benefits.

The lack of access to basic resources in the developing world is identified as not only the result of an absence of means for acquiring them – for which the answer is a technological fix – but sometimes as the result of obstacles placed between people and resources. Particularly in urban areas of the developing world, infrastructures for electricity and water may exist, but may not be accessible to the poor because of their inability to pay for these services. This chapter identifies these environments as different to the rural, ‘blank slate’ model at which much design for development seems to be directed, and shows other means for people in the developing world to access resources.

The APF and their affiliates’ campaign against the installation of prepaid water meters, and the effects of their installation on communities in South Africa, is described. The interaction of the APF and the prepaid meter is interpreted through two perspectives: Bruno Latour’s concept of ‘programs’ and ‘antiprograms’, in which one party seeks to implement a plan of action for another, often reinforced with technological means, and is met by resistance; and South African academic Ismail Davids’ observations about ‘provided’ and ‘popular’ spaces for participation, through which the APF’s actions are interpreted as combining protest with a demand for participation in development.

6.2 Contesting development

In her introduction to the catalogue for *Design for the Other 90%*, Cooper-Hewitt curator Barbara Bloemink recounts her experience as a child visiting her housekeeper’s family in the shanty towns of Bogota, Colombia. She describes visiting her housekeeper’s relatives’ homes, “largely built from purloined highway and road signs”, materials which made for colourful exteriors and “waterproof, solid and roomy” interiors (2007, p.5). “Illegally stripping an electrical wire off the public wiring poles”, she writes, “enabled the residents to light their interiors and play radios” (Bloemink 2007, p.5). Bloemink reflects as an adult on the “creativity and resourcefulness of these recycled, remixed designs”, wondering why it has taken so long for “us to consider design as a word to be applied to the ingenuity of those living on the mountains behind” (Bloemink 2007, p.5).

Artist Marjetica Potrc, referred to in ‘Chapter 4: Art intervenes’, similarly describes herself as interested “in what individuals can do to improve their living conditions. I have found many inspiring examples in informal cities. Under such harsh conditions, design is born of necessity; it’s not just a choice” (Potrc, Marjetica n.d.-a). When conducting research for her *Dry Toilet* project in Caracas, Venezuela, she chose to focus on water and sewerage as systems in which to intervene because people already had sources of electricity: illegal connections to the city’s

grid. They were as a result not as interested in alternative energy sources as they were in the dry toilets. “They saw self-sustainable alternative energy technologies as something only rich people would be interested in”, says Potrc (ibid). The architect and participatory planning practitioner Nabeel Hamdi goes further in interpreting the similarly negative reactions of poor people in Thailand to a scheme for composting their own waste: “while the idea was popular amongst the more well-off and championed by conservationists and sponsors, for the poorer people the whole [scheme] seemed more like a plot to get the municipality of the hook – to get the poor to do their jobs, like all the other participatory self-help projects they had heard about and seen” (Hamdi 2004, p.36). These examples touch on the alternative narrative around ‘(design for) development’ that this chapter introduces – as an intervention that may be resisted rather than welcomed by those it targets.

Both Bloemink’s and Potrc’s accounts identify practices by which the urban poor illegally obtain access to resources, from ‘purloined’ road signs for making shelter, to illegal electricity connections. Bloemink may see this as evidence of resourceful design, but while the ingenuity of poor people in transforming available materials into functional objects is celebrated in design for development forums (William Kamkwamba’s windmills on *TEDGlobal* is an example), the everyday *illegal* actions of the poor, sometimes made in resistance to schemes for development, do not fit as easily into the positive narratives typical of this arena. Despite Bloemink’s anecdote, designs for illegal accessing of resources do not appear in design for development forums.

Accessing basic resources such as water and electricity without paying for them takes place in the context of larger political, economic and social debates: should basic resources be treated as commodities, or human rights? Should they be provided by the state or private companies? For free or for a price, and for what price? What happens when people cannot afford to pay for them? In the developing world, where needs are more acute, people might have particular expectations of or reliance on the state for providing basic resources. Making illegal connections to water or electricity networks may be accompanied by protest and other political action. In implementing technological means to enforce particular interpretations of these issues, water and electricity providers may wish to curtail such debate.

An example of a technological enforcement of a particular regime around water supply is the ‘prepaid’ water meter, which requires users to purchase credits for water on a card or electronic key: when this is placed in the meter, it allows that amount of water to flow through it, and then cuts off the supply. This allows the state or private companies to avoid users running up bills that they cannot pay, and of going through the legal processes and physical

confrontations necessary to cut off a customer for non-payment, who instead ‘self-disconnects’. The ethics of this technological fix is contested, as it has the potential to deprive people of a vital resource. While their use is promoted in many countries, especially in the developing world, in Britain, for example, they were made illegal under the U.K. Water Act of 1998, “based on the premise that the provision of water is vital to public health” (Public Citizen 2010).

In implementing prepaid meters, requiring users to pay in advance for water or electricity, public or private institutions are attempting to ‘settle an issue’ through technical means in the manner Langdon Winner describes in the quote at the head of this chapter. Winner in his paper ‘Do artifacts have politics?’ identifies instances in which “the invention, design, or arrangement of a specific technical device or system becomes a way of settling an issue in the affairs of a particular community” (Winner 1986). This is one way in which “artifacts can contain political properties” (ibid). Winner refers in his paper to examples of this phenomenon: most famously the bridges built across freeways in Long Island, New York at such a low height that buses could not pass under them. This was the result, according to Winner, of the “social-class bias and racial prejudice” of the New York city planner Robert Moses who wanted to ensure that the white middle-classes who drove cars could access the public parks and beaches of Long Island while excluding “poor people and blacks, who normally used public transport” (Winner 1986).

Such ‘programs’, as Bruno Latour calls them, by which one party seeks to enforce or ‘prescribe’ a programme of action upon another, may be met by ‘antiprograms’ of resistance, as Latour outlines in his paper ‘Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts’ (1992). This is what has happened in South Africa, where prepaid meters are a key component in the state’s programme for privatization and ‘cost-recovery’ in the provision of water and electricity. There community activists such as those affiliated with the Anti Privatization Forum (APF), the main subject of this chapter, have responded by removing or destroying prepaid water and electricity meters, and illegally reconnecting people’s supplies. They do this within a wider context of protests and other political and legal actions. Their actions are interpreted later in this chapter through the concept of ‘invited’ and ‘created’ spaces for participation, the subject of an article by South African academic Ismail Davids.

The APF’s practice, combining public protest and civil disobedience with pragmatic action to secure resources, continues the focus of this thesis on projects that combine immediate functions to benefit the user with communication to other audiences. The APF are a unique

instance amongst the other examples used in this thesis in that their method for connecting the poor in the developing world to resources involves the removal of designed objects, rather than their introduction; but they themselves could also be described as an ‘object’ which acts both immediately and to distant audiences.

6.3 The APF

The APF is one of the most visible faces of a broad movement in South Africa against the privatisation of services and resources. This takes place in the context of the post-Apartheid, African National Congress (ANC)-led South African government shifting from long-held commitments to nationalise banks, mines and industries, promises made during the anti-Apartheid struggle and included in the African National Congress (ANC) Freedom Charter, towards the privatisation of formerly state-run services. Many in the APF and affiliate organisations took part themselves in the struggle against Apartheid.



Fig 6.2: Anti Privatisation Forum (APF) activists on a protest march, carrying ‘prepaid’ water meters they have removed from their communities

The APF describe their role as to “unite struggles against privatisation in the workplace and community. It is open to any organisation or individual opposed to privatisation. The APF links workers’ struggles for a living wage and jobs with community struggles for housing, water, electricity and fair rates and taxes” (The Anti-Privatisation Forum 2001). Founded in 2000, it is a national organisation which has its own identity but acts too as an umbrella organization or connection point for other ‘social movements’; it is as its name states a

'forum' for individuals, communities and organisations to "share their experiences and to strategise collectively" (The Anti-Privatisation Forum 2001). They link grassroots struggles in different parts of South Africa, organise and take part in protests, and research and publish information around privatisation and resistance to it.

One of the sites of public resistance they have been involved in is that of residents of communities around Johannesburg to the installation of prepaid water meters. Prepaid meters for both water and electricity are a key component in the state's move towards privatisation and cost-recovery for these services. They do not allow customers to run up bills for water or electricity that they are unable or unwilling to pay, and billing and payment collection is simplified for the suppliers. In South Africa, prepaid water meters are meant to supply a fixed amount of water per month without payment, a commitment made by the South African government in response to protests after the removal of formerly free water sources led to a cholera outbreak: "over 200 people [in KwaZulu Natal] died of cholera after having been forced to drink water from polluted streams due to Umgeni Water Board charging the poor residents of Ngwelezane for water provision" (McKinley n.d.).

Now, the state represents the prepaid water meter as a means to supply this free basic water allowance to poor South Africans, to 'make sure they get it' (Coalition Against Water Privatisation 2004). This frames the prepaid meter as a tool of 'development', a way to extend services to the poor. This is also reinforced by the instances where the state will extend water supply networks to poor households only on the condition that they accept the prepaid meter as the method of delivery (*ibid*). The adequacy of the free basic water allowance, and the reliability of accessing it via the prepaid meter, is the subject of contention.

The prepaid meter is not the only object used by municipalities in South Africa to restrict poor communities' access to water. The 'trickler' is another example. Similar in appearance to a button, it is a disc perforated with two small holes, which restricts water flow through a pipe, (see fig 6.3 below). With a trickler installed by the municipality, "It takes you 15 [minutes] before you get a cup full of water to drink. And it takes you maybe two hours before you can have a good bath" (Carty 2003). As an alternative to the prepaid meter, it is intended to reduce the amount of water households which are unlikely to be able to pay, can consume.



Fig 6.3: A community activist in Durban holds a ‘trickler’ (Carty 2003), left; an APF activist holds a prepaid electricity meter (original source unknown, possibly Indymedia South Africa), right.

The APF were involved in conducting research and supporting the protests of residents of Orange Farm and Phiri, neighbourhoods near Johannesburg, in 2003/2004 against pilot projects for the installation of prepaid water meters by the private company Johannesburg Water, and the City of Johannesburg. Johannesburg Water was at the time under the management of Suez Lyonnaise Des Eaux, one of the top three transnational companies managing water supplies worldwide. Johannesburg Water’s expected profits in 2003/2004 were US\$13 million (Coalition Against Water Privatisation 2004). Orange Farm is the largest of what in South Africa are euphemistically called ‘informal settlements’: unplanned neighbourhoods of largely poor black residents. Two thirds of the people in Orange Farm live in self-made shacks and the majority of residents are unemployed (Orange Farm Water Crisis Committee et al. 2004).

6.3.1 The free basic water allowance

Through examining a document researched and published by the APF with the Orange Farm Water Crisis Committee (OFWCC) and the Coalition Against Water Privatisation (CAWP) in 2004, we can identify some of the attitudes of the organisation towards water provision, the installation of prepaid water meters, and the adequacy of the state’s free basic water allowance. The document, titled *Destroy the Meter/ Enjoy free water*, frames access to water as a basic human right, founded in cultural as well as legal mores. It refers to the United Nations Commission on Economic, Social and Cultural Rights (ECOSOC), which states that “water is ‘indispensable for leading a life in human dignity’, and... is necessary for the realisation of

other rights”, and to the South African Constitution, which “specifically states that every person has the right to sufficient water, and that the state should be proactive in ensuring the ‘progressive realisation’ of this right” (Orange Farm Water Crisis Committee et al. 2004, p.5). The document reproduces information from the World Health Organisation (WHO) regarding the amounts of water people need: 25 litres a day “in order to survive” and 100 litres a day “in order to lead a healthy life” (ibid). The amount of 100 litres still does not include water for other uses such as growing food or caring for the sick.

The amount of water the prepaid meters supply for free is 6,000 litres per household per month. The state assumed a figure of 8 people per household, providing for 25 litres per person per day – sufficient for survival but not for leading a healthy life, growing food, taking care of the sick, for gatherings brought about by ceremonies such as weddings or funerals, or for emergencies. While the APF found an average of 5 people per household in Orange Farm (Orange Farm Water Crisis Committee et al. 2004), making for 40 litres per person per day, CAWP researchers in Phiri found an average of 16 people per property (Coalition Against Water Privatisation 2004), so only providing for 12 litres of water per person per day. We can compare these figures to a 1997 study by Rand Water, the state entity which supplies water from source, that found that average daily personal water consumption by Soweto residents (Phiri is in Soweto) was close to 700 litres per person per day, and 2,500 litres of water per person per day in wealthier areas (Coalition Against Water Privatisation 2004). In comparison to these figures, the provision of 25 litres of free water per person is clearly a massive reduction and unlikely to be sufficient for more than basic survival.

The right to adequate water without having to pay for it is made more pressing by massive poverty and unemployment in South Africa. Inability to pay for services is a very real hardship for many people. Prepaid water is charged for at a higher rate than bill-paid water, exacerbating the effects of their installation in mostly poor areas. The Coalition Against Water Privatisation reproduced figures for employment in Soweto, derived from a study by University of the Witwatersrand sociologists in 1999. The study reflects the “disastrous levels of unemployment in historically African townships”: full-time employment for people over 16 years old was just under 30%; unemployment for people between 20 and 29 years old was particularly high, with 43% completely unemployed and only 25% in either full or part-time work (Coalition Against Water Privatisation 2004, p.10). A high proportion of households in Soweto subsist on small government grants and pensions. In these circumstances, many households will be living only on their free allowance of water.

6.3.2 Effects of the prepaid meter

Newspaper reports from the time of the installation of prepaid water meters in Orange Farm describe the effects of the reduction in water consumption they enforced. Residents previously had access to free water through unmetered standpipes. One of the activities that suffered is food-growing. “Celina Sephakamela from Orange Farm in southern Johannesburg used to keep a vegetable garden behind her shack where she grew spinach and mielies [maize] to feed herself, but she now struggles to keep her garden because she cannot afford to buy water”, reads an article in *This Day* newspaper in 2004 (Jeffreys 2004). Sephakamela is unemployed, with a migrant worker husband who is away much of the time. She used to fetch water from a communal tap to grow vegetables. “I don’t use much water” she told the reporter, “I use it only to clean my house, to do the washing and to wash myself. I can’t water the plants anymore” (Jeffreys 2004). The APF recorded a similar loss of food gardens in Orange Farm (Orange Farm Water Crisis Committee et al. 2004). For poor people, the loss of these independent sources of food has particular impact.

Food gardens have also been promoted in South Africa as a means by which poor people with HIV/AIDS can supplement their diets. Many people in areas like Orange Farm and Phiri are HIV-positive. As PlayPumps International described, as reported in ‘Chapter 2: Design for development’, people with HIV/AIDS have especial need of water for sanitation and taking medicines. In addition, CAWP researchers reported a high incidence of other illnesses, such as sugar-diabetes and high blood-pressure in Phiri residents (Coalition Against Water Privatisation 2004).

The inability of people to pay for more water once their allocation has run out has led people to walk distances to fetch water from areas where prepaid meters have not yet been installed. “The introduction of prepaid water meters [and their inability to pay] has resulted in the work of women and children increasing as they now have to walk long distances to collect and carry water from neighbouring extensions where water is still freely available” (Coalition Against Water Privatisation 2004, p.8). The work of managing water resources in the home, now made tighter, falls disproportionately on women, the same document reports.

The CAWP report points to the socially fragmenting effects of prepaid meters, causing family members or neighbours to fight over the allocation of a scarce resource. “The majority of residents [in Orange Farm] interviewed believe that relations between neighbours is deteriorating as people begin to steal water from each other; and celebrations of traditionally communal events, such as weddings and funerals, are becoming increasingly impossible as

unaffordability prevents such large gatherings” (Coalition Against Water Privatisation 2004, p.8). APF researchers report that were asked to pay 20c for a glass of water by residents during their fieldwork; and they write that the poorly-paid informal workers who were contracted to dig trenches for the installation of the prepaid meters in Orange Farm “were introduced to prepaid water meters from residents in the area while working there: when in need of a cup of water they were asked by residents to pay up front” (Orange Farm Water Crisis Committee et al. 2004, p.29).

6.3.3 Returning issues to debate

It is clear that the APF and affiliates see the prepaid water meter as a pre-emptive closing down of debates over water provision, which has been forced upon poor communities. “The logic of the prepaid system seems already to have been accepted by the state and private companies without proper interrogation of its attacks on people’s basic human rights” they write (Orange Farm Water Crisis Committee et al. 2004, p.1). The prepaid meter is seen as a “technology [that] violates the basic right to access water, and... it should be rejected” (ibid). The APF undertakes a range of activities in their campaign against water and electricity privatisation and the installation of prepaid meters. They conduct research with a range of partner organisations, and release publications documenting these findings and educating people about the issues involved. They take part in legal proceedings to challenge the use of prepaid meters. They organise and lead street protests; and they advocate and take part in the removal and destruction of prepaid meters and the reconnection of people’s supplies cut off for non-payment. On 11 November 2008 for example, thousands of Gauteng residents, led by the APF, marched to the office of the Mayor of Johannesburg in protest at summons and fines issued by the City of Johannesburg for tampering with or removing prepaid water meters. They brought with them their summons and dozens of prepaid meters they had removed from their communities to “return to sender” (Nic 2008). These were dumped outside the mayor’s office (see fig 6.4 below).

For a partial perspective on the APF’s multi-level actions, we can turn to a study that investigates the workings of an APF affiliate organisation, the Soweto Electricity Crisis Committee (SECC). The document, *Urban Identity in post-apartheid Soweto – A case study of the Soweto Electricity Crisis Committee* (2005), is a Masters thesis submitted by University of the Witwatersrand student Alex Wafer. The SECC, Wafer tells us, “emerged initially as a local response to electricity cut-offs and the lack of adequate service delivery in large parts of Soweto. With varied success, [they have] maintained a strategy of protest action that includes

marches, media activism and illegal reconnections” (Wafer 2005, p.7). SECC activists are involved in protests against water as well as electricity privatisation. Wafer refers to an occasion in October 2004 when SECC members were arrested during protests against the installation of prepaid meters in Phiri, Soweto. At the same time as the group of 100 or so SECC members protested, “SECC members in other areas were attending church services, ‘illegally’ reconnecting electricity and otherwise living the daily life of Soweto” (ibid). The loose-knit organisation is involved with protests such as the attempted “symbolic” disconnection of the Johannesburg Mayor’s house in 2002, actions through which “the movement has cultivated a public profile of open antagonism with various levels of the state” (ibid), and at the same time with work in their communities including electricity and water reconnections, disseminating information, and holding weekly branch meetings which serve as “support structures where branch members share their experiences with each other” (Wafer 2005, p.8).



Fig 6.4: ‘Return to sender’ - prepaid meters uprooted and dumped outside the Mayor’s office

The “repertoire” of protest actions the SECC undertakes, from marches, constitutional arguments and electricity reconnections should be understood, Wafer writes, as both “public acts of protest and defiance” and “everyday acts of survival” that reflect the lived experiences of SECC branch members in their communities (Wafer 2005, p.15). The APF too combines public protest with pragmatic means for survival, and a focus on local action in the community with linking to broader political struggles.

In 2008, a long-running court case arguing for the illegality of prepaid water meters and an increase to the free water allowance, brought by residents of Phiri and supported by the APF and a large number of affiliates, reached the High Court in South Africa. In April 2008 High Court Judge Tsoka “declared that the City of Johannesburg’s forcible installation of prepaid water meters in Phiri (Soweto) is both unlawful and unconstitutional... and directed the City to provide residents of Phiri the option of an ordinary credit metered water supply” (Coalition

Against Water Privatisation 2008). The judgement also called for 50 litres of water per person per day to be supplied free of charge. The City of Johannesburg appealed the case, which went next to the Supreme Court. The Supreme Court produced an ambiguous judgement that overturned part of the High Court's judgements, causing the APF and affiliates to appeal the case to the highest court in South Africa, the Constitutional Court. In a disappointing verdict for the campaigners, the Constitutional Court found in October 2009 that prepaid meters were not illegal, reversing the High Court judgement, and declared that "the City is not under a constitutional obligation to provide any particular amount of free water to citizens per month" (McKinley 2009). And, it added, "it was not for the residents to decide how much water people should get, but for government" (SAPA 2009). The APF's struggle continues.

6.5 Discussion

The example of the APF and the prepaid water meter shows that barriers to resources may sometimes have been placed there by other parties, and so connecting poor people in the developing world to resources is not simply a matter of designing positive means for them to do so: sometimes the removal of human-made obstacles is required. Their interaction shows that sometimes intentions for 'development', here through the implementation of a new technology, may be rejected by the people it is supposedly to benefit. The prepaid meter has 'political qualities' in the way Winner identifies; technology is here a site of social struggle. And the APF's 'repertoire' of actions is a real-world example for the necessity of the kind of work identified in interventionist art and critical design: to protest and communicate while acting immediately, to provoke the unaffected at the same time as equipping those affected.

What follows is a discussion of the issues involved in the interaction of the APF and the prepaid meter over the issue of water privatisation, first from the perspective of Latour's identification of programs and antiprograms employing artefacts, and secondly through looking at the APF's intentions and way of protesting. This is interpreted in part through Davids' identification of 'provided' and 'popular' spaces for participation, which frames the APF's actions as a consequence of the failures of provided spaces for participation, and as a form of popular participation in itself.

6.5.1 Programs and antiprograms

In his paper 'Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts' (1992), Bruno Latour describes ways in which plans to control the behaviour of others may be reinforced through the use of technological artefacts. He calls these plans 'programs', and

actions in resistance to these ‘antiprograms’. Latour uses an example from his everyday life to illustrate this idea. When driving his car with his young son Robinson in the back, Latour keeps ordering his son to sit down behind him and not to stand in the space between the two front seats. He is concerned that if he brakes hard, his son will be injured. After verbal orders and blocking the gap with his arm prove ineffective, Latour buys a device that blocks the gap between the two front seats and prevents his son from endangering himself. “I no longer scream at Robinson, and I no longer try to foolishly stop him with my extended right arm: he firmly holds the bar that protects him against my braking. I have delegated the continuous injunction of my voice and extension of my right arm... to a reinforced, padded, steel bar... The steel bar has now taken over my competence as far as keeping my son at arm’s length is concerned” (Latour 1992, p. 247).

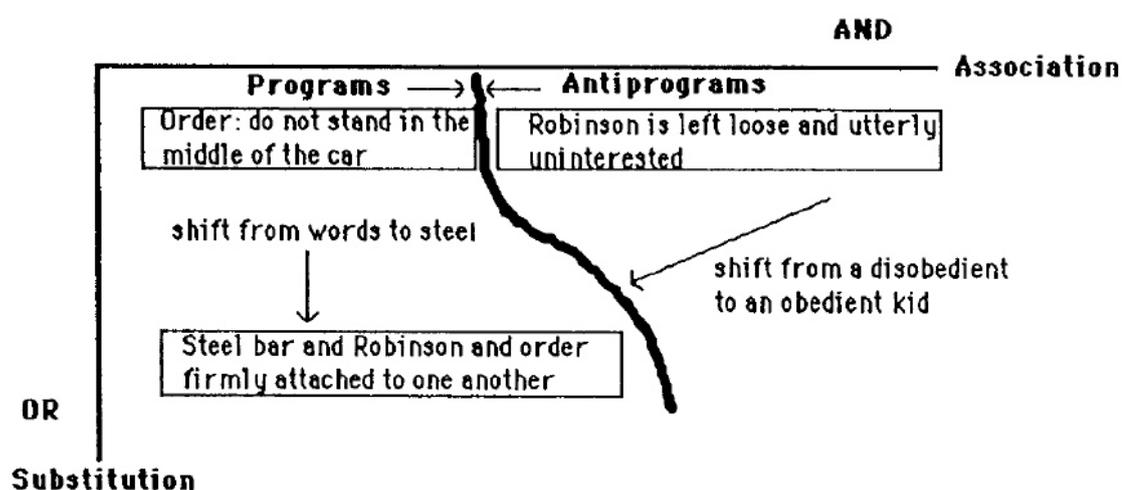


Fig 6.5: Bruno Latour’s diagram allowing one to “map out the story of a script” (Latour 1992, p.248)

Latour produces the diagram in fig 6.5, above, to describe this interaction. The axes of this graph, Substitution (OR) and Association (AND) are borrowed from a conceptual tool for analyzing language. Taking a typical sentence, one can add words in sequence (association) and substitute words for other words (substitution). Linguists “claim that these two dimensions allow them to describe the system of any language” (Latour 1992, p.247). Latour applies this tool to his theory for the interactions of humans and objects by identifying ‘substitution’ as the replacement of “speech and words and flesh” with apparatus, and ‘association’ as the effective tying together of orders, apparatus and the object of the order (here his son) (ibid). His order, at the top left of the diagram is: do not stand in the middle of the car. His son’s ‘antiprogram’ is to ignore Latour’s injunctions. When Latour installs an object to reinforce his orders, his program shifts “from words to steel”, resulting in the steel bar, his son Robinson, and Latour’s order becoming “firmly attached to one another” (Latour

1992, p.248). This firm attachment of elements together shifts his son from “a disobedient to an obedient kid” (ibid). The line dividing programs and antiprograms plots the ‘script’ for a program of action. “The point of the story”, writes Latour “is that it is impossible to move in the AND direction without paying the price of the OR dimension, that is renegotiating the sociotechnical assemblage” (Latour 1992, p.248).

In South Africa, the state in trying to advance its program for privatisation and cost-recovery (attempting to move along the ‘association’ axis), called on the prepaid water meter, adding it to the ‘sociotechnical assemblage’ (along the ‘substitution’ axis). The APF push back against the script by removing the prepaid meter, protesting by literally ‘returning the object to sender’, and so metaphorically returning the issue from steel to words, to reverse Latour’s phrase: taking the issue back to the law courts, the media, and public debate. How much deviation from the script they accomplish is hard to measure, especially with their defeat in the Constitutional Courts – here the battle on the level of ‘words’ was ultimately unsuccessful, though protracted.

The APF remove the prepaid water meter because it is an obstacle to acquiring water; and because it is an object that cannot be otherwise argued with. It precludes or excludes debate. Through prepaid meters, not only is debt “never able to be incurred”, but “providers (private companies) and consumers (citizens) do not have to interact directly” (Coalition Against Water Privatisation 2004, p.5). “You can’t negotiate with the meter to give you water if you are sick, or if there is a fire” (Friction Films 2009). The effect of prepaid meters is described in one publication titled “The Struggle Against Silent Disconnections” as “a silent gun because those at whom it is aimed go quietly and without loud political commotions that come when council has to physically disconnect angry residents” (Coalition Against Water Privatisation 2004, p.7).

The implacability of technological means of enforcing behaviour is implied in Latour’s phrase describing his implementation of an object to control his son: “from speech and words and flesh it has become steel and silence and extrasomatic” (Latour 1992, p.247). Apparatus may be harder to contest, and impossible to argue with or make delegations to. In the same paper, Latour describes the use of artefacts in substitution for humans as “delegation to nonhumans” (Latour 1992, p.234). He illustrates the phenomenon through several examples in addition to the anecdote involving his son. One example is of an automatic door-closer in an office building he is using in Paris; on a day when it is broken, someone has pinned up a notice explaining that “The Groom Is On Strike”: “groom” is a corruption of the French for an automated door-closer or butler (Latour 1992, p.231). The name, and the note, imply the role

of the human for which the device substitutes. Another example is a substitution of a more symbolic nature. In the kitchen of the hospital where Latour was born is a mechanical meat-roaster from the 16th century that Latour remembers as a child. The machine includes a model of a little man, “le Petit Bertrand”, who moves his head and arms and appears to rotate the spit via a small handle. In fact, a human is needed to wind the mechanism of the machine via a larger handle below; but it is the homunculus Bertrand who is “the delegated author of the movement” of the spit and whose presence expresses the idea of the human for whom a nonhuman machine has been substituted (Latour 1992, p.241).

The recent Constitutional Court judgement in South Africa makes specific use of the City’s delegation to the prepaid meter to justify cutting off people’s water; they argue that because the water is still there, though stopped by the meter from flowing, it does not constitute a ‘discontinuation of supply’. Lawyer William Trengrove had argued in his submission to the Constitutional Court on behalf of Phiri residents that “prepaid metres are not compatible with the Water Services Act because the Water Services Act does demand a hearing before people are cut off” (News24 2009). The Water Services Act of 1997 states that water providers “must give reasonable notice before they cut off water supplies to people” and that “a person’s ability to pay must be taken into consideration when making the decision to stop water provision” (Orange Farm Water Crisis Committee et al. 2004, p.6). Phiri residents, supported by the APF et al, were arguing for a return to a person-by-person evaluation of water cut-offs. The constitutional court argued that “the ordinary meaning of “discontinuation” is that something is made to cease to exist. The water supply does not cease to exist when a pre-paid meter temporarily stops the supply of water. It is suspended until either the customer purchases further credit or the new month commences with a new monthly basic water supply whereupon the water supply recommences. It is better understood as a temporary suspension in supply, not a discontinuation” (McKinley 2009). As such, no hearing was necessary. Their ‘little man’ fulfils its role of deflecting responsibility admirably.

This effect of the prepaid meter can be seen through contrasting the situation in South Africa with that in Northern Ireland. A non-payment campaign against water privatisation in Northern Ireland knows it can rely on legal protection from cut-offs. The Irish Congress of Trade Unions (ICTU) led the campaign, advocating non-payment of charges as the best way to overturn the state’s proposals. They reassure people by stating that “the legal position is clear - Non-payment of water charges is NOT a criminal offence [and] The water company CANNOT turn off your domestic supply” (Irish Congress of Trade Unions 2007). Protest and contestation of the state’s policies is possible there without losing one’s access to water.

Prepaid water meters render such protections moot and restrict the effectiveness of campaigns like these.

Latour offers a “general descriptive rule” for analysing delegation to nonhumans: “every time you want to know what a nonhuman does, simply imagine what other humans or nonhumans would have to do were this character not present” (Latour 1992, p.232). In the case of the prepaid meter, we could perhaps imagine a person standing by a home’s water outlet, accepting payment for water. This person would have to be entirely unwilling to negotiate. They would be implacable in the face of entreaties. Even if there was a fire within sight of them, or a sick person needing water, they would refuse. If it was human, it would be cruel, fanatical, or psychopathic. An additional tragedy of the intrusion of this inhuman personality into poor communities in South Africa is its corrosive effect on social relationships, as described earlier: its pathology is contagious. It is a divisive object.

Latour writes that “no human is as relentlessly moral as a machine” (Latour 1992, p.234). He calls the behaviour “imposed back onto the human by the nonhuman delegates *prescription*” (ibid). Not only force but also “values, ethics and duties” can be delegated to apparatus in this way (ibid). It is the purpose of the City of Johannesburg to instil a particular interpretation of good citizenship through their use of prepaid meters, one which is expressed in their slogan “Nothing for Mahala” – ‘nothing for free’ (Orange Farm Water Crisis Committee et al. 2004, p.3). But this prescription discriminates against those who might desire to be ‘good citizens’ under wider definitions of the term, but who do not have the means to satisfy the prepaid meter’s program (IF you have money, THEN you may draw water). The ‘values, duties and ethics’ imposed onto humans by this nonhuman delegate are trumped by the psychopathy of its personality. It breaks with principles of compassion and community while enforcing adherence to a citizenship of individual responsibility, where one’s worth is judged by your ability to pay.

The prepaid meter is not, however, substituted for a particular person. It is substituted in the first place for an unmetered or conventionally-metered water supply; in the second it is substituted for systems composed of humans and words: judicial processes, debate, consultation. In uprooting the meters, activists asked for a return to human negotiation of the issue – not just as an overall judgement of the courts, but for each instance that a poor person is cut off for their inability to pay for water. The installation of prepaid meters allowed the state to obfuscate this requirement.

6.5.2 Protest and participation

The claims of the City of Johannesburg that prepaid water and electricity meters ‘empower’ residents through enabling them to ‘take ownership’ and control their consumption (Coalition Against Water Privatisation 2004) are contradicted by other reports that residents do not know how to read them and were not properly consulted on their installation. “Many said that they were not consulted, did not understand how the meters work and were unable to tell if they were receiving their allocation of free water” (Jeffreys 2004). Buhle Mpanza, a resident of Orange Farm, told *This Day* that “I can’t read this water meter. We were never told how to use it. The council came here and told us they were installing pipes for sanitation” (Jeffreys 2004). Before the installation of the prepaid meter, she said, “residents used a communal tap and were able to get more water” (ibid). Gloria Mveve also says she does not understand how the meter works. “We were not asked about this thing” said Gloria Mveve, “These people just came and put it in. They gave us this token and said we must take it with us when we need to buy water” (ibid).

Research carried out by the Coalition Against Water Privatization in Phiri show similar results: a lack of understanding of how the meters work, and a lack of consultation around their installation (Coalition Against Water Privatisation 2004). Residents at the time were facing the installation of prepaid water meters; they had already been using prepaid electricity meters for some time. CAWP found that “almost half the households reported that running out of electricity had caused ‘fighting in the house’; 67% [of respondents] said that they felt ashamed as a result of not having electricity” (Coalition Against Water Privatisation 2004, p.17). Contrary to the ‘empowerment’ advertised by state and private authorities as a resulting from prepaid meters, the experience of being denied basic services through their inability to pay is one of humiliation for poor citizens.

In protesting, the APF are trying to have meaningful participation in the decisions that effect their member’s (and their neighbours’ and communities’) daily lives. They see the participation and consultation the City of Johannesburg and Johannesburg Water claim to engage in as phony. Their research, and evidence published in South African newspapers (Jeffreys 2004) suggests that residents were not properly consulted, and could not be said to have properly participated in the decision to install prepaid meters. 90% of Orange Farm residents interviewed by the APF said they only consented to prepaid meters because they believed that

was the only way they could get flush toilets⁶ (Orange Farm Water Crisis Committee et al. 2004). Phiri residents reported that they were threatened with water cut-offs or higher water charges if they did not accept the meters; and a majority of residents said they first they knew about the prepaid meters was when they saw pipes being laid for them (Coalition Against Water Privatisation 2004). Where Orange Farm residents had participated in meetings about the prepaid system, they felt that their concerns had not been taken into consideration (Orange Farm Water Crisis Committee et al. 2004).

Ismail Davids, executive director of the Foundation for Contemporary Research, writing for the *Cape Times*, notes the particular importance of participative processes in “the South African context of poverty and underdevelopment [where] the quality of life and livelihoods of entire communities largely depend on effective municipal governance” (Davids 2006, p.13). Davids identifies two types of participative spaces available to communities to “participate actively in development decision-making and governance”: ‘provided spaces’ and ‘popular spaces’ (ibid). Participation in provided spaces is also referred to as ‘structured participation’ or ‘participation by invitation’, and refers to participatory structures initiated and regulated by government (ibid).

In South Africa structured participation includes government engagement with local structures within communities such as Orange Farm or Phiri known as ward committees. The City of Johannesburg and Johannesburg Water did engage with ward committees, but because the ward committees themselves are not effective structures for community participation, this process was corrupted. Orange Farm residents felt that Johannesburg Water focused only on persuading ward committee leaders to consent to the project, and felt let down by their community leaders (Orange Farm Water Crisis Committee et al. 2004). The APF reports that Johannesburg Water opened tender processes for the work of installing prepaid meters through the ward committees, and that individuals in these committees tendered for and were awarded contracts, giving them a vested interest in the installation of prepaid meters (Orange Farm Water Crisis Committee et al. 2004).

Popular spaces for participation are those occupied by people at their own initiative, “to engage government on terms that are not provided for within provided spaces” (Davids 2006, p.13). The APF represents an institutionalised form of popular participation (ibid). Citizens

⁶ These toilets were installed. One toilet flush consumes 12 litres of water – half a person’s free daily water allowance. Many people cannot afford to flush their toilets (Orange Farm Water Crisis Committee et al, 2004).

should not be “straitjacketed into provided spaces such as ward committees and development planning forums” writes Davids (ibid). Davids warns too of ‘participation fatigue’, in which people become tired of participating “in their own development” without seeing meaningful benefits (ibid). This echoes the suspicion noted by Nabeel Hamdi in the first half of this chapter, in the Thai ‘self-help’ composting scheme, which seemed to the poor like another plot to get them to do the municipality’s job (2004).

“Government should accept”, writes Davids, “that citizen-initiated forms of participation are as important as the provided spaces for participation set out in policy and law” (2006, p.13). Unfortunately, he notes, many South African politicians do not see protest as a legitimate form of democratic participation. Though structured participation in South Africa should never substitute for popular participation, Davids believes, structured participation could prevent “the more hostile and disruptive forms of public participation” if it changed to address more of the needs of communities (ibid). Popular participation such as that undertaken by the APF could be seen in this way as putting pressure on structured participation spaces to reform.

Wafer identifies in his thesis that social movements such as the APF emerged in India and post-colonial Africa as a result of the “inability of the post-colonial state to occupy a central organizing role in society”; and as a result of the limited reach of the state (Wafer 2005, p.11). Poor black South African citizens have especial expectations of the state, led by a revolutionary party whom they supported into power, and which promised to reform their lives. While the SECC may adopt an antagonistic stance towards the state, they are doing so in order to compel the state to take a more active role. They reject the handing over of services that should be the role of the state, to private companies.

The recent Constitutional Court judgement overturning the rights of citizens to be served by their state, to receive sufficient free basic services and to reject a technology implemented through a flawed participative process reflects the combination in South Africa of a state that on the one hand cannot deliver services effectively to the poor – and which is intent on giving up this responsibility to private interests – and on the other hand exercises an authoritarian disdain for the poor: it is not for residents to decide how much water they should get, but the government.

6.6 Summary

This chapter examined the APF's resistance to water privatisation in South Africa, particularly through the prepaid water meter. The APF introduces to the thesis an example of another way in which 'objects' can act immediately, and communicate to audiences: they connect poor people to resources in the developing world by removing a technological obstacle, and they perform this action as part of a 'repertoire' of protest, attracting public attention to their cause.

The prepaid meter is presented as a means for the government to supply their free basic water allowance to poor South Africans: it introduces another type of 'design for development' object to the thesis. The resistance of poor communities to it indicates another narrative around development to those presented by the design for development objects presented in Chapter 2 – one in which efforts at development are resisted by its targets. This chapter contextualised the APF as an example of people in the developing world 'contesting development': people may see self-help projects as a way of states evading their responsibilities, and they may regard technological regimes such as the prepaid meter as prematurely foreclosing debate over issues such as the provision of basic services.

The actions of the APF were examined in detail, as were the impacts of the prepaid meter on poor communities. The APF's actions against the prepaid meter were interpreted through Latour's concept of 'programs' and 'antiprograms': the South African state, in implementing its program for water privatisation, enlists the prepaid meter to the 'socio-technological assemblage'; the APF in turn institute antiprograms that include removing prepaid meters.

The APF's meter removals and water reconnections, and accompanying street protests and legal challenges to the state, constitute both 'protest and participation'. The prepaid meters were instituted through flawed or fraudulent participative processes, taking place through compromised 'provided spaces' for participation, as Davids describes them. The APF occupies 'popular spaces' for participation. In the end, their protest actions are aimed at returning issues to debate, to turn them back from 'steel to words'.

The next chapter returns to the *PlayPump*, recording suspicions generated by its claims in comparison to the Zimbabwe Bush Pump's performance, and to the standards for water provision outlined in this chapter. The 'fluidity' of the *PlayPump* is examined, using perspectives from Chapter 3: Fluid technology, along with recently available sources of evidence on the *PlayPump's* performance in the field.



Fig 7.1: A *PlayPump* without advertisements, and with no water in the tank, visited by the author in KwaZulu Natal in August 2010. See fig 7.5 in this chapter for photographs of all 10 installations visited in the region.

Chapter 7

Reanalysing the *PlayPump* 1: performance

“...it is all too common that the new and the foreign does not work, and that ‘all that glitters ... ends up as a rusty heap of useless technology’”

De Laet and Mol, quoting Morgan, *The Zimbabwe Bush Pump – Mechanics of a Fluid Technology*, Social Studies of Science, 2000, p.77

7.1 Introduction

This chapter analyses the performance of the *PlayPump* using recently available information about the *PlayPump*'s performance in the field, and De Laet and Mol's formulation of fluidity as appropriateness. This analysis is juxtaposed against the claims made for the *PlayPump*'s impact and performance, as detailed in Chapter 2: Design for development.

The chapter introduces several sources of evidence for the *PlayPump*'s performance that only became available in late 2009 and early 2010; these sources are detailed in the next section below. The *PlayPump*'s performance is then analysed: first through establishing the suspicions generated by comparison between it and the Zimbabwe Bush Pump, and from what we know about standards for water provision in South Africa (and the consequences of not receiving enough water), as established in the previous chapter.

From these suspicions, we move to an analysis that draws material from across all sources of recently available evidence to establish a set of 10 main faults in the *PlayPump* system. These faults, along with what we already know about the *PlayPump* from Chapter 2, are called into the framework established in the analysis of the Zimbabwe Bush Pump in Chapter 3, using De Laet and Mol's account of its 'fluidity', to establish what fluidity might be in the *PlayPump* system; and so to interrogate its claims to be an appropriate technology.

This chapter concludes with an overall evaluation of the *PlayPump*'s performance and fluidity. This is carried forward into Chapter 8, where the *PlayPump* is analysed further from the perspectives of interventionist art, critical design, and activist practice.

7.2 Reanalysing the *PlayPump*

In this chapter, and the next, the *PlayPump* is reanalysing using perspectives gained in each of the chapters since the *PlayPump* was first described in Chapter 2: Design for development. The analysis is divided into two parts: this chapter, Chapter 7, analyses the *PlayPump*'s performance using recently available reports and studies from the field, and interrogates its claims to be an appropriate technology, using De Laet and Mol's formulation of 'fluidity' from Chapter 3: Fluid technology. The second part of the analysis, in Chapter 8, uses the analyses of interventionist artwork and critical design projects from Chapters 3 and 4, and the analysis of South African activism against water privatisation from Chapter 6, as 'critical lenses' through which to further examine the *PlayPump*. The conclusion to Chapter 8 reflects back on the claims established in this chapter, to complete the account of the *PlayPump* for this thesis. This account is used in Chapter 9 to reflect on design for development, and the wider role of 'objects in development'.

The analysis of the *PlayPump*'s performance in this chapter starts with the suspicions aroused through comparing it with the capabilities of the Zimbabwe Bush Pump (as described in Chapter 3: Fluid technology) and through what we know about the South African standards for water provision, and the consequence of not meeting water standards, from Chapter 6: Antiprograms. These suspicions are established to demonstrate that even before evidence of the *PlayPump*'s performance in the field became available, there were already grounds for questioning its claims – and some means for undermining them.

These suspicions are confirmed by recently available evidence of the *PlayPump*'s performance in the field. Starting with the first reservations about the system expressed by then newly-appointed PlayPumps International CEO Gary Edson, in September 2009 (as mentioned in Chapter 2) a series of critical reports on the *PlayPump* began to appear. These reports, which are consulted in this chapter, are listed here.

Two reports that evaluate *PlayPumps* in the field:

1. UNICEF produced a study of *PlayPumps* installed in South Africa, Mozambique and Zambia in 2007, titled 'An Evaluation of the PlayPump® Water System as an Appropriate Technology for Water, Sanitation and Hygiene Programmes'. They conducted "visits and interviews with communities and institutions already using PlayPump® water systems in South Africa, Mozambique and Zambia", and carried out "physical assessments of installed PlayPump® water systems in the above

countries” (UNICEF 2007, p.6). The report is signed by Clarissa Brocklehurst, Chief of Water, Environment and Sanitation (WES) at UNICEF Headquarters and Peter Harvey, Chief, WES, UNICEF Zambia, who thank “PlayPumps International for facilitating the study in South Africa” (UNICEF 2007, p.4).

The report was “not released publicly and remains an internal UNICEF document” (FRONTLINE/World 2010). According to Roundabout Outdoor, UNICEF withdrew this report at their request, agreeing with them that it shouldn’t have been published, as it was “unsolicited” and “was just trying to run them down” (Melman & Morris 2010). Though it had been circulating amongst donors (FRONTLINE/World 2010), it only came to public attention when Andrew Chambers referred to it in an article in the Guardian newspaper in November 2009 (item 6 below). UNICEF in Dublin told me that month that they had no knowledge of the report. I obtained a copy from Chambers.

2. The Mozambiquan government in 2008 commissioned an evaluation of *PlayPumps* installed in that country, titled ‘Mission Report on the Evaluation of the PlayPumps Installed in Mozambique’. The study was led by Karl Erpf (whose report on the Zimbabwe Bush Pump we consulted in Chapter 3) working for the Swiss Resource Centre and Consultancies for Development (SKAT) in co-operation with the Centro de Formação Profissional de Água e Saneamento of Mozambique. The report is co-authored by Erpf and Ana Lucia Obiols. It was produced for Mozambique’s National Directorate of Water, the Ministry of Education and Culture, the Ministry of Public Works and Housing, the World Food Programme, and UNICEF, who had, along with Save the Children USA “initiated the introduction of the PlayPump in Mozambique” (Obiols & Erpf 2008). At the time of the report, there were about 100 *PlayPumps* installed in Mozambique (ibid).

This report too “was never released” (Costello 2010b). I was made aware of it by the PBS TV film *Troubled Water*, aired in June 2010 (item 7 below), which made the report available for download from their website.

An informal set of blog posts documenting *PlayPumps* in the field:

3. ‘Owen’, a volunteer for Engineers without Borders (Canada) in Malawi, started posting his personal observations about the *PlayPump* in August 2009 on his blog ‘Barefoot Economics’; by August 2010 he had produced six posts on the *PlayPump*.

His posts document the views of users of the system, his own observations and tests, and his arguments about the faults in the *PlayPump* system.

The letter from PlayPumps International reassessing the *PlayPump*:

4. Gary Edson, as the recently appointed CEO for PlayPumps International (US), published a letter on the PlayPumps International website 100 days after taking office, on 21 September 2009, titled '100 day message from the CEO'. In his letter, Edson reviews the successes and shortcomings of the *PlayPump*, and announces the suspension of further production of *PlayPumps* until some concerns with the system are addressed. This letter is included in the appendix, as it is no longer available online.

A letter from the head of another water organisation, on the *PlayPump*:

5. David Martin, Supporter Care Officer for water and sanitation aid organisation WaterAid, circulated the letter 'Viability of PlayPumps', dated 16 October 2009, as a "position statement" explaining why, although "assertively marketed" to them, their organisation does not support the use of *PlayPumps* (Martin 2009).

And finally, two critical reports on the *PlayPump* in the press:

6. Andrew Chambers, journalist and former aid worker, wrote an article for the Guardian newspaper on 24 November 2009, titled 'Africa's not so magic roundabout', which questioned the performance claims for the *PlayPump*, and criticised it as a marketing gimmick which does not work effectively in the field. This article made public both UNICEF's 2007 report on the *PlayPump*, and David Martin's letter for WaterAid.
7. Amy Costello, who had produced the 2005 PBS TV show 'The PlayPump', which was instrumental in the project's success (as described in Chapter 2), responded to rumours of problems with its rollout in the field to produce the follow-up report 'Troubled Water' for PBS' FRONTLINE/World, broadcast on 29 June 2010. She interviewed users of the system in Mozambique, as well as government and development organisation representatives. Her report made public SKAT's Mozambiquan government-commissioned report on the *PlayPump* from 2008 (item 2 above).

From these reports, this chapter selects, extracts and synthesises a list of ten main faults identified in the *PlayPump* system, through drawing evidence from across studies – mainly from SKAT's exhaustive evaluation of *PlayPumps* in Mozambique, and from UNICEF's

smaller study in Zambia, Malawi and South Africa. Reading and synthesising these reports was made possible for this author through the research into water pumps and appropriate technology performed for Chapter 3: Fluid technology, especially Erpf's and De Laet and Mol's work on the Zimbabwe Bush Pump. Drawing evidence from across all recently available sources of evidence on the *PlayPump* into a coherent short-list of faults in the system – work that does not yet appear to have been performed – is a contribution to making information about the *PlayPump* more accessible to other researchers, activists, development practitioners and, with further work, the public.

This detailed identification of the main faults in the *PlayPump* (along with what has already been established about the *PlayPump* in Chapter 2: Design for development) is called into the framework that was established in Chapter 3 to capture de Laet and Mol's formulation of 'fluidity' as a tool for analysis and a way to characterise appropriate technologies. Applying this analytic framework to the *PlayPump* produces a set of detailed observations about its strengths and weaknesses. These are summarised in conclusion, and the perspectives from this chapter are carried forward into the second part of our reanalysis of the *PlayPump*, in Chapter 8.

7.3 Suspicions aroused by the *PlayPump*'s claims

Before evidence became available about the gap between the *PlayPump*'s claims and its actual performance as observed and documented in the field, research for this thesis had already raised some suspicions about its claims. These suspicions were based first of all on the variation within the claims for the number of people the *PlayPump* could supply with water, as described in Chapter 2 – from 1,600 as expressed by Field in one source, to 5,000 as expressed by Coca-Cola; secondly for the sparseness of information about its capabilities – in comparison with scales of performance for the Zimbabwe Bush Pump operating in different circumstances, we have just one figure for the pumping rate of the *PlayPump*; and thirdly for the fact that there had apparently been no evaluation of the system, in contrast to the extensive testing to which a technology such as the Zimbabwe Bush Pump had been subjected. Building from these broad misgivings, a comparison between the unsupported claims of the *PlayPump* and the stringently evaluated claims of the Zimbabwe Bush Pump yields some more specific suspicions about the unreliability of the *PlayPump*'s claims.

We can make use of a simple table (fig. 7.2 overleaf) to summarise what we know so far in this thesis about the *PlayPump*, from Chapter 2, and the Zimbabwe Bush Pump B-type, from Chapter 3, from which we can draw some salient points for establishing our suspicions here.

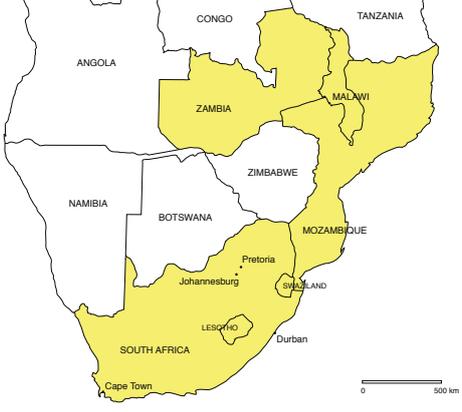
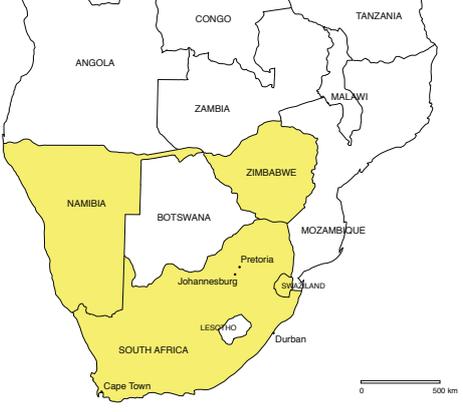
PlayPump	Zimbabwe Bush Pump B-type
	
Number of pumps in the ground in 2010:	
1,700	30,000 (approx.)
Number of people each is rated to supply:	
2,500	250
Pumping rate claimed at 40 metres depth:	
1,400 litres per hour (lph) (diameter unknown)	550 lph (50mm diameter) (All B-type) 750 lph (63.5mm diameter) 950 lph (75mm diameter)
Performance figures independently verified:	
No	Yes
Maintenance model:	
'Service' model - users call or SMS to alert Roundabout Outdoor in Johannesburg to visit installation for repairs.	Community-based maintenance model as lowest tier; two higher tiers of trained workers at a wider district level.
Funding model:	
Donor-funded manufacture and installation; mix of state, NGO and private donors. Advertising-funded maintenance.	Largely donor-funded manufacture, installation and maintenance. Mix of state and NGO funding.
Cost in 2010:	
US\$14,000 (hardware, transport, installation)	US\$1,200 (hardware only available)
Patented:	
Yes	No

Fig 7.2: Table comparing the *PlayPump* and Zimbabwe Bush Pump B-type according to our data so far.

If we do a straightforward comparison between the *PlayPump* and the Zimbabwe Bush Pump, using what we know about their respective performances, as recounted in the table on the previous page, we could compare them on two points for which we have explicit claims: the rate at which they pump water, and the number of people that each can supply. At 40 metres depth (the only depth for which its makers supply a figure), and at 16 rotations per minute, Roundabout Outdoor claims the *PlayPump* can pump water at the rate of 1,400 litres per hour. At the same depth (and at an assumed input power of 75W), according to the table reproduced in Chapter 3 from Erp’s evaluation of the Zimbabwe Bush Pump, the smallest-bore Bush Pump pumps 550 litres of water per hour, the medium 750 litres per hour, and the largest 950 litres per hour. The *PlayPump* appears to comfortably outperform the Zimbabwe Bush Pump, at almost double the rate of its medium-bore. This seems a little strange – the *PlayPump*, after all, operates a ‘conventional borehole pump’ (Roundabout Outdoor n.d.), and amongst borehole pumps, the Zimbabwe Bush Pump, de Laet and Mol tell us, is of “exceptional competence” (2000, p.231). This is our first grounds for scepticism.

For the number of people each pump can supply with water, here too the *PlayPump* appears to outperform the Zimbabwe Bush Pump to an even greater degree. Though we have noted in Chapter 2 some variation in reporting of this figure for the *PlayPump*, with Coca-Cola for instance claiming that “each will supply water to 4,000 to 5,000 people” (Coca-Cola c. 2000), the main figure reported is that of 2,500 people. Operating in very similar environments to the *PlayPump*, in the same general geographic region, the Zimbabwe Bush Pump is only intended to supply communities of up to 250 people; meaning the *PlayPump* can apparently supply water to 10 times as many people as the Zimbabwe Bush Pump.

There is something odd about the relationship between these two sets of figures: those for the number of people supplied, and for their respective pumping rates. If we look at these two sets, there’s a large difference in their relative ratios of ‘pumping rate’ to ‘people supplied’:

<i>Pump:</i>	<i>Pumping rate:</i>	<i>People supplied:</i>
Zimbabwe Bush Pump	750 lph	250
PlayPump	1,400 lph	2,500

If the *PlayPump* pumps water almost twice as fast as the mid-sized Zimbabwe Bush Pump (1,400 litres per hour compared to 750 litres per hour), we might expect it to be able to supply almost twice as many people with water: close to 500 people perhaps. But the *PlayPump*’s claim is much larger – it can supply water to 10 times as many people as the Zimbabwe Bush Pump, though pumping not quite twice as fast. This is our first strong indication that there is

something slippery about the performance figures claimed for the *PlayPump*, and that there is more to find out about it.

If we wanted to look at these ratios more closely, we could multiply the pumping rate per hour by an amount of hours, to arrive at a volume of water to be shared amongst the people the pump supplies. As we don't have a figure for how much time either pump is intended to be in operation for in a day (this is not made explicit by PlayPumps International or Roundabout Outdoor) we could multiply by an easy number – let's say 10 hours – in order to compare volumes of water rather than pumping rate. So the figures then would look like:

<i>Pump:</i>	<i>Volume pumped in 10 hours:</i>	<i>People supplied:</i>
Zimbabwe Bush Pump	7,500 litres	250
PlayPump	14,000 litres	2,500

So in 10 hours, the Zimbabwe Bush Pump could supply each person with $7,500/250 = 30$ litres of water; and the *PlayPump* could supply each person with $14,000/2,500 = 5.6$ litres of water. While the actual number of hours a day each pump is actually intended (or required) to be in operation for is still an unknown variable, we can observe another large difference in the performance of each pump, this time in favour of the Zimbabwe Bush Pump: because of how many people *it is rated to* supply, it supplies them with much more water in a given space of time than the *PlayPump*. And this is where we start to see a major problem with the *PlayPump*, which has all kinds of repercussions for the system – at the number of people *it is advertised as* supplying, it does not supply very much water in comparison to a competent handpump such as the Zimbabwe Bush Pump, operated for the same amount of time.

Thinking of the amount of time the *PlayPump* might be intended to be in operation for in a day also begs the question – how much time each day would children realistically *play* on the roundabout for? This, after all, is the advertised capability of the system, its main innovation: that it can produce water without effort, through joyful children's play, rather than through work; and it is advertised as cutting down on the amount of time children spend collecting water, so allowing them more time in school. The amount of time for which the *PlayPump* needs to be in operation each day, and these advertised capabilities and benefits of the system, are likely to be in tension with each other: reduce the time children spend collecting water, and have them pump water as a by-product of play rather than work VS. ensure the *PlayPump* is in operation for enough time each day to supply sufficient water to the large number of people it is rated to serve.

In Chapter 6 we looked in depth at the question of what constitutes sufficient daily water for poor people in South Africa, living in the same territory in which the *PlayPump* originates and operates. The minimum daily water needs of a poor person we know to be the subject of contention in South Africa: but the state has agreed to supply a minimum of 25 litres per person per day without charge via the prepaid meter, though the APF regards this as insufficient. As the South African government supports both the introduction of prepaid meters in largely urban areas, and the *PlayPump* in rural areas, and it acknowledges their responsibility to supply this minimum amount per person, then it would be reasonable to expect that both sources of water would need to meet the same minimum requirements. Ronnie Kasrils, as minister for the Department of Water Affairs and Forestry in South Africa (DWAF), wrote both that his department “demands” that local government chooses arrangements for water provision that “gives priority to meeting the needs of the poor and to the provision of free basic services”, including via the prepaid meter (Kasrils 2003); and he also supported the introduction of *PlayPumps* as “an elegant solution... to one of his department’s key challenges: the provision of water to remote areas” (Bloom 2004, p.20).

But from our brief look at the capabilities of the *PlayPump*, we know that if it pumps water at the rate advertised, and it is placed in the size of community it is advertised as serving, then if it is in operation for 10 hours a day, each person will only be supplied with 5 litres of water a day, a fifth of the amount the state in South Africa has agreed to provide as a ‘free basic service’. And the amount of 10 hours a day already seems like it might be a lot to expect children to play for, if it is to be truly play, day in and day out, every day.

Through comparing the performance metrics and other capabilities advertised for the *PlayPump* against the well-established performance capabilities of the Zimbabwe Bush Pump and the hard-won minimum requirements for water provision from the South African state, we arrive at a set of suspicions: that the *PlayPump* cannot supply water in sufficient quantities to the amount of people it is claimed to, in order to meet national standards for water provision; and that meeting even a fraction of this demand would place the needs of the community in tension with the system’s main advertised benefit of work accomplished through play. It is unlikely in these circumstances that children’s play would produce sufficient water for their community’s needs.

We also know, from the effects of the prepaid meter noted in Chapter 6, what the likely effects of an insufficient supply of water will be. Without enough water, food-growing suffered, with residents unable to water their crops; people began to walk long distances to water-sources that were still free, increasing the work of women and children; people felt

ashamed when their water or electricity was cut off; and social relationships deteriorated due to fighting over scarce resources in the home and community, with traditional communal events decreasing due to the expense of providing water. People with illnesses, who require more water, suffered especially. We can look out for these effects in communities served by the *PlayPump*.

We have arrived at these suspicions without checking the *PlayPump*'s manufacturer's and promoter's claims against any information about its performance in the field; and until quite recently it was not possible to do so, as neither Roundabout Outdoor or PlayPumps International had commissioned any independent testing of the system, and it did not appear that any other evaluations or field work had taken place. It is significant that it is still possible to arrive at these suspicions without this information, because it shows that parties involved with the project had both the grounds and some means to question the project's claims, and yet these still went largely unquestioned. But with the release of previously suppressed studies, and other first-hand information from the field, much more was revealed about the system: and what this information shows us is that the performance of the *PlayPump* is actually far worse than even the suspicions arrived at here would imply.

7.4 Ten faults identified in the *PlayPump* system

In this section, evidence from sources of information about the *PlayPump*'s performance in the field, as introduced earlier, are used to build on the suspicions just recorded. This account starts with the difference between the advertised performance of the system's pump and its actual performance in the field, as that affects other calculations below and impacts on other flaws in the system. The ten points below list the main faults identified in the *PlayPump* from reports and studies in the field; there are still more flaws in the detailed operation of the pump, or in consequence of these below, which will be revealed at other points in this chapter.

1. The pump does not perform at the rate advertised

Firstly, reports from the field identified *PlayPump* installations that did not pump at the rate claimed by its manufacturers. UNICEF, for example, found that "in Mozambique some stakeholders reported that it takes approximately 4 hours of continuous pumping to fill the 2,500 liter reservoir tank" (2007, p.8). This means that this particular installation pumped water at around 625 litres per hour, rather than 1,400 litres per hour.

There would be, as we know from our investigation of the Zimbabwe Bush Pump, variation in the performance of any pump – though this variation is not documented by Roundabout Outdoor or PlayPumps International. UNICEF notes that for the *PlayPump* too, “the ease of operation... may be influenced by the depth to the dynamic water level and installation details” (UNICEF 2007, p.9); and Erpf points out that “how much water a *PlayPump* is able to draw is mainly depending on the physical condition of the pump operators (age of children) and on the daily operation time” (Obiols & Erpf 2008, p.33).

But both UNICEF’s and SKAT’s reports draw attention to a mechanical limit which restricts its performance of any *PlayPump*. Because of the configuration of the pump head, restricted by its containment within the roundabout, the *PlayPump* has a very short pumping stroke (the up and down travel of the mechanism that lift water up the borehole). The roundabout uses an unusual interior mechanism to drive the pump (see fig 7.3 below), whereby the circular movement of the roundabout raises and drops the pump valve twice on every rotation, pushing it along two curved tracks within the roundabout, rather than using the lever action of a conventional handpump. As a result, the pump stroke for the *PlayPump* is on average about 6.5 cm, compared to 22cm on the AfriDev, for example, Mozambique’s national standard handpump (Obiols & Erpf 2008). As the *PlayPump* operates on the same boreholes as handpumps, using a similar range of cylinder sizes, this means it must pump less water per stroke than a conventional handpump.



Fig 7.3: The interior of the *PlayPump*’s headgear, left (Obiols & Erpf 2008, p.21); and the Zimbabwe Bush Pump’s headgear, showing the much longer travel of the pump mechanism, right (arrows and text added).

Erpf calculates in his report the maximum theoretical pumping rate of a *PlayPump*, using a simple formula: he calculated the amount of water pumped on each stroke according to the cylindrical volume of water displaced, multiplied by the number of rotations per minute, multiplied by 2 as there are two pump strokes per rotation of the roundabout. For a *PlayPump*

using a 50mm diameter cylinder, the same size as the smallest diameter Zimbabwe Bush Pump and AfriDev handpump – more about the range of diameters of *PlayPumps* follows – this is calculated below. Erpf used 20 rotations of the roundabout per minute as his measure, rather than the 16 on which Roundabout Outdoor’s claim is based; this will be corrected for shortly:

Calculation of projected cylinder area: $d^2 \times \pi/4$ or $52 \times 3.1416 /4 = 19.63 \text{ cm}^2$

Calculation of discharge/stroke: $19.63 \text{ cm}^2 \times 6.5 \text{ cm} = 127.59 \text{ cm}^3 = 0.128$
litres

Discharge per minute (20 RPM) 2×20 strokes $\times 0.128$ litres = 5.12 litres

Discharge per hour 60×5.12 litres = 307.2 litres

(Obiols & Erpf 2008, p.33)

So at 20 rotations per minute, a *PlayPump* with a 50mm diameter cylinder pumps a maximum of 307.2 litres per hour, in ideal conditions. The manufacturer’s claim is based on 16 rotations per minute; if we use Erpf’s formula, but for 16 rotations per minute instead of 20, we arrive at only 245.8 litres per hour. This is for the smallest cylinder; there are two larger sizes of cylinder used by *PlayPumps* (the size of cylinder varies according to the size of the borehole the pump is installed on): using Erpf’s formula, the 80mm diameter, which is the largest size cylinder used in Mozambique (Obiols & Erpf 2008, p.25) could pump a maximum of 627.8 litres per hour at 16 rotations per minute, and the 100mm diameter cylinder, used only on shallow wells in South Africa (ibid), 979.2 litres per hour at 16 rotations per minute. Rather than 1,400 litres per hour, we have a range from roughly 250 litres per hour to 980 litres per hour, as absolute maximum, ideal values; and in Mozambique, no more than 630 litres per hour, as the largest cylinder used in that country is 80mm.

Erpf compares the *PlayPump*’s performance to the 50mm diameter AfriDev handpump, which can pump a theoretical maximum of 845 litres per hour at the same rate of pump strokes (Obiols & Erpf 2008); and the 50mm diameter Zimbabwe Bush Pump on the shallowest borehole can pump 1,300 litres per hour at 75 W input power (pump strokes per hour not noted) (Erpf 1998). This is against less than 250 litres per hour for the same sized *PlayPump*.

Ø mm diameter	PlayPump	AfriDev	ZBP B-type
50mm	245 lph	845 lph	1,300 lph

Fig 7.4: Maximum pumping rates for the 3 pump types, 50mm cylinder, 16 rotations (or 32 strokes) per minute

If it seemed strange that the *PlayPump* could drive a conventional borehole pump to produce water at almost double the rate of the Zimbabwe Bush Pump – it is strange, because untrue. Both the AfriDev and the Zimbabwe Bush Pump in fact far outperform the *PlayPump*, pumping 3 to 5 times as fast.

2. It fails to meet recognised standards for minimum water supply

This is mainly because the amount of people the *PlayPump* can serve is oversold; and so it is placed in communities far larger than it can supply. We have already calculated that it would be impossible for the *PlayPump* to supply people in South African with their 25 litres daily minimum, if it is intended to serve 2,500 people; at 10 hours a day it could only supply a fifth of their needs. Chambers in his article in the Guardian, identifying the *PlayPump* system as “based on flawed water demand calculations”, performs a calculation based on a similar principle: he works out how much water a *PlayPump* would need to pump to supply the daily water needs of 2,500 people, based on a minimum daily water requirement of 15 litres per day, from the Sphere Project, who tabulate requirements for disaster relief (Chambers 2009). Based on the pumps advertised capability of 1,400 litres per hour, this would “require children to be “playing” non-stop for 27 hours in every day” (ibid).

“Under more reasonable assumptions”, Chambers continues, “a Playpump could theoretically provide the bare minimum water requirements for about 200 people a day based on two hours’ constant “play” every day” (ibid). From observations in the field, and from Erpf’s calculations of its maximum pumping rate, we know that the system is even less capable of meeting this requirement than Chambers estimates; but his calculations show that even without first-hand information about the *PlayPump*’s performance, its claims can be easily undermined using available evidence about standards for water provision, against the manufacturer’s claims.

Erpf states several times in his report to the Mozambique government his concern that the *PlayPump* contravenes Mozambique’s national water policy, which requires any means of water provision to supply at least 20 litres per person per day (Obiols & Erpf 2008). Using his revised figures for a more realistic, though still idealized output from the *PlayPump*, he calculated the following estimates for the maximum amount of people it could supply. If the pump is installed in a primary school, he concedes that 5 litres per child per day should be enough for drinking water and hand-washing only, while at school; if the *PlayPump* was used for 6 hours per day, then around 940 students can be served with this amount. If the pump is shared between a primary school and a community, then he calculates that if adults used the

PlayPump for the remaining 6 hours in a day, getting 20 litres each, then an additional 235 beneficiaries could be served. And if the *PlayPump* is installed in a community, not a school, then “the users could theoretically operate the pump for the whole day (12 hours) without interruption. Under such circumstances maximal 470 beneficiaries (2 x 235) could be served [with 20 litres each], far less than the 2’500 claimed in the advertisement” (Obiols & Erpf 2008, p.30).

Erpf’s assumption that the *PlayPump*’s roundabout could be in operation for 12 hours a day is both generous, in terms of increasing his estimate for the amount of people the *PlayPump* could realistically serve – Chambers, after all, thinks 2 hours a day of ‘play’ is a reasonable expectation – and realistic, in that the estimate is based on Erpf’s knowledge that where the *PlayPump* is the primary source of water, people might have to operate it for up to 12 hours a day. “According to the comments of water users, a PlayPump is in use between 6 to 12 hours per day” (Obiols & Erpf 2008, p.36). But the *PlayPump*’s roundabout is not in motion for this many hours a day through play, and neither Erpf nor UNICEF in their report make any pretence that this is the case.

3. Children’s play is not the main source of input to the pump

Both UNICEF’s and SKAT’s reports observe that adults are frequent users of the *PlayPump*. Because both the pumping rate of the system and the number of people it can supply are exaggerated several-fold, children’s play cannot produce enough water to meet the needs of the community, and so adults – uniformly women – must operate the *PlayPump*’s roundabout. They do this by standing next to the roundabout and turning it by hand (Obiols & Erpf 2008).

In fact, adults and children are sometimes in competition for the *PlayPump*, not as plaything, but as vital means of access to water. “In hot weather with sunshine, it is unpleasant to operate the pump during the time between late morning to early afternoon. Early morning and late afternoon is also the time when the adults want to fetch water. During this time they don’t like if their hard work of drawing water is interrupted by playing children” (Obiols & Erpf 2008, p.25). When the *PlayPump* is shared between a school and a community, this competition is more pronounced. “Depending on the size of the school and the number of hours the PlayPump is occupied by the children, not much time is left for the community to draw water for serving a large user group. Communities in need of getting water are therefore not happy when being interrupted by children in their daily task” (Obiols & Erpf 2008, p.30).



Fig 7.5: Women turning the *PlayPump*'s roundabout by hand, from SKAT's report in Mozambique (2008)

This is predictable; David Martin of WaterAid warns that although the *PlayPump* “seems like a good use of children’s high spirits, these may not be available at times of water demand, early morning and early evening and if the weather is wet” (2009, p.1). While the system’s water tank is meant to lessen this problem by enabling water to be stored over times when children are not playing, because of the pressures on the system the water tank is almost never full.

4. The roundabout is painful and undignified for adults to use

Out of 26 pump installations surveyed by SKAT in Mozambique, to the question ‘Pump operation liked by the community?’ all adults responded ‘no’ (Obiols & Erpf 2008, p.72). UNICEF too found that in Zambia “many users reported that their pumps were hard to operate,” and that all women interviewed in that country said they did not like using the pump (2007, p.9). The *PlayPump*'s roundabout is designed for children to use; at around 60cm off the ground, it is the right height for this use. But it is too low to be comfortable for adults to use, who have to bend over to turn it. At 15 out of the 26 locations surveyed by SKAT, adults said the roundabout gave them a sore back (Obiols & Erpf 2008). A woman in Mozambique told Amy Costello, “From 5 a.m., we are in the fields, working for 6 hours. Then we come to this pump and have to turn it. From this, your arms start to hurt. The old handpump was much easier” (Costello 2010c).

In addition to the awkward height of the roundabout, the wheel is also difficult to turn because there is resistance to be overcome twice on each turn of the roundabout’s wheel, as the pump mechanism is lifted (Obiols & Erpf 2008). While the first-world audience for the *PlayPump* might assume from its publicity that the wheel turns with the ease of a conventional roundabout in a playground, this is not the case. “Some primary school children complained of becoming tired very quickly after pushing the pump, particularly as additional torque is

required with each rotation to commence the upstroke of the piston” (UNICEF, p.8). Especially without weight on the roundabout – adults do not want to sit on it like children – there is little momentum to overcome this resistance when it is turned by an adult.

A young woman in Mozambique demonstrated to Costello how she could jump onto the *PlayPump*'s roundabout and push it around, but, she said, indicating women sitting nearby “These old women wouldn't do it like this” (Costello 2010c). SKAT's report from Mozambique confirms that both elderly people and heavily pregnant women were not able to move the roundabout's wheel (Obiols & Erpf 2008).

It is not just the physical discomfit that prevents some women, such as the elderly, from using the pump: some women said that they felt embarrassed to be seen operating the roundabout, especially “where the people watching them did not know the linkage between the ‘merry-go-round’ and the water pumping”, for example where the pump is near a public road (UNICEF 2007, p.10). The *PlayPump*'s roundabout is both physically and psychologically discomfiting to its adult users.

5. The water tank is a hindrance to users

As there is unlikely ever to be excess water pumped by the *PlayPump*, as the pressures on the system outweigh its capabilities, the water tank is unlikely ever to be filled. “Not one single water tank was found by the mission that was used for storing excessive water from pump operation”, reported SKAT's study in Mozambique (Obiols & Erpf 2008, p.34). “The users were all pumping only just as much to fill their own canisters and the small amount of water that children were able to pump was immediately used for drinking purposes” (ibid). “All user communities visited reported that the reservoir tank is never completely full”, reported UNICEF, “and 75% of communities in Zambia and Mozambique reported that they only operate the Playpump® to directly fill water containers, i.e. the tank never stores any excess quantity of water” (UNICEF 2007, p. 9).

UNICEF's study states the problem that resulted: “This means excessive work is needed to raise the water to the elevated tank with no additional benefit accrued” (UNICEF 2007, p. 9). Looking at the diagram of the *PlayPump* system in Fig 7.6, overleaf, the problem can be observed: where a conventional hand-pump supplies water directly from the top of the borehole, the *PlayPump* pumps it first a distance of several metres horizontally from the roundabout-pump to the base of the elevated water tank, then up 7 metres to the tank – this vertical upwards distance is the most significant, working against gravity – down again, and

then several more metres across the ground to the faucet from where water can be drawn. When the tank is empty, the water has to be pumped across this whole distance every time.

Owen graphically describes the problem as he observed it in Malawi, where he saw a lone woman operating the *PlayPump*'s roundabout, “locked in a full body struggle getting the wheel to spin” (Owen 2009b).

With every rotation I could hear a small splash of water in the tank (about 20ft above), followed by a splash of water into the lady’s bucket on the ground beside us. Because the tank wasn’t full (which I figure they almost never are), the lady was essentially having to exert herself to move the water 20ft upwards, just to have it come back down again. I don’t know what you think, but to me it seemed like a bit of unnecessary extra effort to fill a bucket (ibid).



Fig 7.6: The distance water has to travel from the borehole to the standpipe. Photograph by the author.

The other function of the water tower is to support the billboards whose rental is intended to generate income for maintenance; here too the system has not lived up to expectations.

6. Advertising on the billboards is not a secure source of revenue

The *PlayPump*'s billboards are presented as a means of the project's 'sustainability', and a way for private companies, governments and organisations to reach a poor rural demographic. But, especially in more remote rural areas, far from busy roads – installations that are close to roads have fared better for advertising – the *PlayPump*'s billboards are often blank. I have observed this myself on an informal tour of *PlayPump* installations in rural KwaZulu Natal, South Africa in 2010, where 8 out of 10 installations in the area surveyed had no billboard advertisements at all (see fig 7.7, next page).

PlayPumps International CEO Gary Edson acknowledged the lack of advertising uptake on the *PlayPump*'s billboards in his '100 day' letter in September 2009, noting that "the global economic crisis took a toll on ad sales". UNICEF's and SKAT's reports found similar evidence in Zambia and Mozambique. "The majority of tanks outside South Africa did not carry advertisements", noted UNICEF (2007, p.15) "Public service messages were observed on approximately half of installed PlayPumps® only" (UNICEF 2007, p.10). In Zambia, "38% of PlayPump® water systems visited had tanks which were completely blank, and 75% carried no advertisements" (UNICEF 2007, p.12).

In SKAT's report, of 100 PlayPumps in Mozambique, only 22 had advertisements (Obiols & Erpf 2008). "The strategy of generating enough funds to cover the maintenance cost for 10 years", noted Erpf, "does not work in rural Mozambique. In such places, no potential clients can be reached with the advertisement on the billboards. Most billboards are therefore initially blank and according to Roundabout Outdoor... the pumps in Mozambique are cross-subsidized by South Africa and Zambia, in order to cover the costs for maintenance interventions" (Obiols & Erpf 2008, p.35). "It is claimed by Roundabout Outdoor that this model is making the water supply solution financially sustainable. This is clearly not the case in Mozambique" (Obiols & Erpf 2008, p.15). We can note in Roundabout Outdoor's response that they claim advertising in Zambia and South Africa will cross-subsidise Mozambique's installations: yet UNICEF documented hardly any more *PlayPumps* with adverts in Zambia, and my own tour of *PlayPumps* in South Africa, while informal, appeared to show the same problems there.

That the billboards are not a viable source of income for the maintenance of *PlayPumps* cannot have helped Roundabout Outdoor fulfil its guarantees to maintain them; though this is not the only reason why maintenance of *PlayPumps* has been a persistent problem.



Fig 7.7 *PlayPump* installations visited in KwaZulu Natal by the author in August 2010, with their Roundabout Outdoor tag numbers, where present/visible.

7. The maintenance system for the pumps is unsatisfactory

The downtime of *PlayPump* installations awaiting repair in Mozambique, SKAT's report states, has been "a real disaster" (Obiols & Erpf 2008, p.37). At the site where Costello interviewed women users in Mozambique, local users told her that the *PlayPump* had not produced any water in 6 months. "When women called or texted the repair line, they told me they got no response" (Costello 2010c). These women had to walk some distance instead to the next village to collect water.

There are numerous examples from UNICEF's and SKAT's studies, of *PlayPump* installations with faults requiring maintenance, which had not been attended to in some time. UNICEF reported that 25% of the *PlayPumps* they visited in Zambia needed some kind of repair, and noted that "a number of poor quality installations were observed... including pumps with concrete aprons that were heavily eroded only months after installation and pumps with leaking pipes... no remedial action had been taken to rectify the defective results of the poor quality workmanship" (UNICEF 2007, p.8).

"The downtime of some of the PlayPumps... is a real disaster for all stakeholders especially for the communities in need of water", noted Erpf in his report (Obiols & Erpf 2008, p.37). In Mozambique, the average downtime of faulty pumps that could be repaired, as surveyed by SKAT, was 60 days. "This is by far too long for the communities in need" (Obiols & Erpf 2008, p.26). Joaquim George, of Mozambique's Rural Water Authority, told Costello that "Once the pump breaks, and takes more than 3 months to repair, people in these communities no longer trust the PlayPumps" (Costello 2010c). The SKAT team in Mozambique also noted two pumps that had not worked since their installation several months before; one had not been repaired in 10 months, the other, 17 months (Obiols & Erpf 2008).

Erpf was of the opinion that the centralized maintenance and repair system, going through Roundabout Outdoor in Johannesburg, contributed to delays in maintenance (Obiols & Erpf 2008). UNICEF too saw it as a disadvantage of the system that breakdowns could only be reported by users in neighbouring countries, via SMS or phone call, directly to Roundabout Outdoor's offices in Johannesburg: "There is no local registration of O&M teams within the country of operation (outside South Africa) and no local accountability for the services they provide" (UNICEF 2007, p.12). "The administrative part of the maintenance system is too complicated and influences the reaction time between the receipt of the breakdown message and the actual pump repair intervention" (Obiols & Erpf 2008, p.37).

The fact that many user communities surveyed did not know how to report faults in the system also contributed to delays: in Mozambique “36% of the communities and school’s management do not know what to do in case of a breakdown” (Obiols & Erpf 2008, p.38); while of *PlayPumps* inspected in Zambia “75% carried no contact details for the O&M teams and 63% of the respective schools and communities did not know who to contact in case of breakdown” (UNICEF 2007, p.12).

8. Users were not properly consulted before installation

In addition to users not being sufficiently informed about maintenance, Erpf reported that in Mozambique “the mission team also found no signs that communities had been consulted prior to installation or had a say in choosing the pump type of their choice” (Obiols & Erpf 2008, p.31). Costello found similarly – the women at an installation she visited in Mozambique said the first they knew of it was when the *PlayPump* was installed, and their community leader told them that this was where they should get water from now (Costello 2010b). Owen reports the same situation at a school in Malawi (Owen 2010a); and UNICEF found in their study that “there had been inadequate community consultation and sensitization”, and that “users at 63% of PlayPump® sites visited in Zambia indicated that they were not adequately consulted” (2007, p.10). “There was not one community visited by the mission who claimed to have had a decision on the selection on the pump type to be installed” reports SKAT from Mozambique (Obiols & Erpf 2008, p.19).

9. *PlayPumps* often replace handpumps on existing boreholes

The lack of community consultation in the installation of *PlayPumps* was exacerbated by the fact that in the vast majority of cases, and contrary to the impression given by PlayPumps International and their partners, *PlayPumps* are not placed on new boreholes, so introducing water where there was none before, but on existing boreholes with broken or even working handpumps. This compounds the user dissatisfaction with the system, and their feeling of disempowerment, through not being consulted about the replacement of a technology to which they are accustomed. Of the 100 *PlayPumps* installed in Mozambique at the time of SKAT’s study, 29 had been installed on new boreholes⁷, and the remaining 71 had been

⁷ These were very unusual – Roundabout Outdoor representative Colin Morris told me that **all** *PlayPumps* are installed on existing boreholes (Melman & Morris 2010); these 29 in Mozambique were installed during a project largely administered by World Food Program (WFP) and UNICEF (Obiols & Erpf 2008).

installed on existing boreholes – 28 replacing pumps that were no longer working, and 43 replacing pumps that were working, or had minor problems “easy to repair at community level” (Obiols & Erpf 2008, p.13). At two sites in Mozambique, Roundabout Outdoor’s subcontractor replaced two-month old Afridev handpumps in perfect working order, on boreholes that had recently been rehabilitated by Concern International (Obiols & Erpf 2008).

Given the physical and psychological discomfort caused to adults by the roundabout, and the inferior performance of the pump relative to handpumps such as the Zimbabwe Bush Pump and the AfriDev, it is not surprising that many users told both the UNICEF and SKAT researchers that they preferred their previous handpumps to the *PlayPump*. Users in Mozambique complained about “the increase on time spent to collect water from 47 to 114 minutes after the installation of the PlayPump due to the heaviness of the pump and low yield and the fact that the water tank is never full” (Obiols and Erpf 2008, p.41). The same 63% of users who told UNICEF they had not been consulted, also told them that they “preferred the previous handpump that had been removed to make way for the PlayPump®” (UNICEF 2007, p.10). “Installation of PlayPumps® on boreholes which previously had a different type of pumping system (e.g. India Mark II or Afridev handpump) brings a lot of controversy to communities, since some users prefer the previous system” (ibid).

Users in Mozambique indicated that the distance they had to walk to fetch water had not changed much “because most of the pumps were installed on existing operational boreholes” (Obiols and Erpf 2008, p.41). “Many partners view the PlayPumps International implementation strategy as over-investing”, noted UNICEF, “since it focuses primarily on replacing existing pumps instead of installing on new boreholes in schools that do not already have safe water supplies” (2007, p.13).

10. The system is much more expensive than alternatives

The *PlayPumps* project can also be seen as ‘over-investing’ because of the high cost of *PlayPumps* relative to handpumps. Not only does the *PlayPump* not work as well as other handpumps, but “you could provide at least four conventional wells with hand pumps and associated safe sanitation and hygiene education for the cost of one PlayPump” (Martin 2009, p.2). UNICEF notes with concern that “the cost of PlayPump® water system is high (approx. \$14,000) and has increased dramatically in the last 2 years from the previous \$6,500 without explanation to clients. Many partners had expected the cost to reduce to about \$4,500 by now” (2007, p.13). They add that “key stakeholders in the water sector are not comfortable knowing that the \$14,000 paid for each unit would have covered several conventional

handpump-equipped boreholes or wells, thereby providing safe drinking water to far more people than one PlayPump® can” (ibid). Paul van Beer of water NGO FairWater told Chambers of his frustration at the “millions of US dollars wasted” on the scheme (Chambers 2009). Though this cost is not borne by the user, funds for development projects, as Owen points out, are scarce, “and the challenges are immense in scale and importance”; as part of a basic cost-benefit analysis, we can’t afford pointless “400% inefficiencies” in this sector (Owen 2010b).

To recount the major faults in the *PlayPump* system, the list is repeated here, as headings only:

1. The pump does not perform at the rate advertised
2. It fails to meet recognised standards for minimum water supply
3. Children’s play is not the main source of input to the pump
4. The roundabout is painful and undignified for adults to use
5. The water tank is a hindrance to users
6. Advertising on the billboards is not a secure source of revenue
7. The maintenance system for the pumps is unsatisfactory
8. Users were not properly consulted before installation
9. *PlayPumps* often replace handpumps on existing boreholes
10. The system is much more expensive than alternatives

The suspicion that the *PlayPump* does not pump faster than the Zimbabwe Bush Pump was confirmed; so too the suspicion that it was rated to supply far more people than it could do while providing a recognised minimum amount of water. And evidence from the reports studied confirms that the effects of an inadequate water supply from the *PlayPump* are predicted by the impact of the prepaid meter noted in Chapter 6:

Food-growing suffered, with UNICEF noting that “there is often insufficient quantity of water to carry out other activities such as gardening and sanitation. Some schools actually stopped or drastically reduced their small-scale irrigation efforts as a result of this” (UNICEF 2007, p.9). Owen recorded the comments of teachers at a school in Malawi who told him they had to stop growing food when their handpump was replaced by a *PlayPump* (Owen 2010a).

The work of women and children increased, with people started to walk to other water sources: *Troubled Water* showed women in Mozambique whose *PlayPump* had been broken for several months, and who had to walk 40 minutes to the next village for water (Costello 2010c); Erpf noted the time spent collecting water increased with the *PlayPump* (2008). People who are sick or old suffered more, through not being able to turn the *PlayPump*'s roundabout.

Where people with prepaid meters felt ashamed when their water or electricity was cut off, and social relationships deteriorated due to fighting over scarce resources, the *PlayPump* embarrasses women who have to use it, and it also causes social friction: Costello reported that the village which received a “daily influx” of 150 families from another village whose *PlayPump* had failed were upset by this draw on their resources, “causing tension” between the communities (2010b).

7.5 The fluidity of the *PlayPump*

From the suspicions generated about the *PlayPump*'s claims, and the evidence gathered here of 10 main faults identified in the *PlayPump* system, the analysis moves to the *PlayPump*'s claim to be an appropriate technology. In their paper on the Zimbabwe Bush Pump (2000), De Laet and Mol argue that what makes the Bush Pump B-type an ‘appropriate technology’ is its fluidity. The *PlayPump* too is promoted as an appropriate technology – how does *it* fare as a ‘fluid’ object in De Laet and Mol’s terms? We examined their account of the fluidity of the Bush Pump B-type, in Chapter 3, under three headings: of its boundaries, of its working order, and of its maker. We will examine the *PlayPump* using the perspectives established there, under these same headings, below.

7.5.1 ...of its boundaries...

De Laet and Mol define the fluidity of the Zimbabwe Bush Pump’s boundaries in the following ways: i) its changeability over time; ii) its continuity with other hand pumps; iii) its inclusion of and reliance on other objects, including materials, tools and people; and iv) its variance in size, from discrete object, to the size of the nation, as a ‘nation-building’ pump.

i) The Zimbabwe Bush Pump’s changeability over time was made visible in the continuing operation of older models of the pump, so that multiple versions of the Bush Pump were in use simultaneously at the time of De Laet and Mol’s paper. This fluidity is the result both of the robustness of the pump, and of its continual reassessment and design modification,

making it “not an immutable but a changeable object, that has altered over time and is under constant review” (de Laet & Mol 2000, p.228).

The *PlayPump*, in contrast, has changed little over time. The major changes to the form and mechanics of the *PlayPump* happened right at the start of the project, at some time between 1989, when Field first saw Stuver’s prototype for the roundabout pump, and 1993, when the first model was installed. These design changes were, according to Field: to change the roundabout from the type with a ‘floor’ a few inches above the ground, to its current shape; to develop the pumping mechanism so that the roundabout could be turned in either direction – Field says Stuver’s original design used an Archimedes Screw principle, that could only turn in one direction (Eastman 2008); and to add a water tank and billboards to the roundabout and pump. These modifications were made before the first model was installed in the field. In the 17 years since, from 1993 to 2010, there has been little to no further modification by Roundabout Outdoor to the form or mechanics of the *PlayPump*⁸.

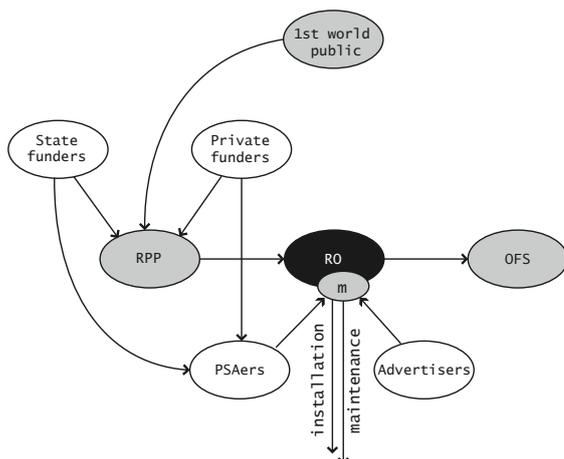
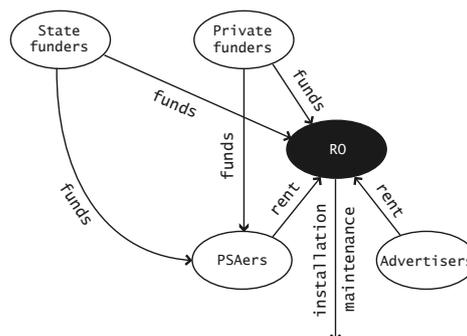
Where changes have occurred to the *PlayPump* system over time, post-1993, it has been to the ‘removed’ parts of the system: its network for funding and administration. De Laet and Mol’s description of the fluid boundaries of the Zimbabwe Bush Pump, which can be drawn to include other bodies, indicates that the *PlayPump* too can be productively understood not just as a discrete physical object, but as including the network of bodies upon which it depends. The *PlayPump* has experienced near-continual development over time of the network of bodies to which it is connected. These developments were described as part of the history of the *PlayPump* in Chapter 2; Fig 7.8 (overleaf) is a chart that tracks these changes over time in greater detail. Some details of these changes only became available through the release of UNICEF and SKAT’s reports in 2009 and 2010.

The chart focuses on 4 key ‘states’: the system as it started in 1993, administered solely by Roundabout Outdoor; the establishment of a non-profit body independent of Roundabout Outdoor in 2003; One Water’s establishment, followed soon after by the establishment of PlayPumps International through the Case Foundation in 2006 (PlayPumps International (US) is shown partially obscuring PlayPumps International Africa because they became the international face of fund-raising for the PlayPump after 2006, largely taking over PlayPumps

⁸ There is some ambiguity here: Field has mentioned that at one point, probably when they were scaling up their production of *PlayPumps* to fill the Case Foundation/USAID order for 4,000 PlayPumps, they tested and ‘strengthened’ a model for use outside South Africa, to make it “as best they can unbreakable”, because it was to be installed far away, where maintenance would be difficult (London 2010).

1993

The start of the *PlayPump*: Roundabout Outdoor (RO) is the sole body administering it, funded directly by donations and investments from the state and private bodies, and through billboard rentals to state and private Public Service Advertisers (PSAers), and commercial advertisers.

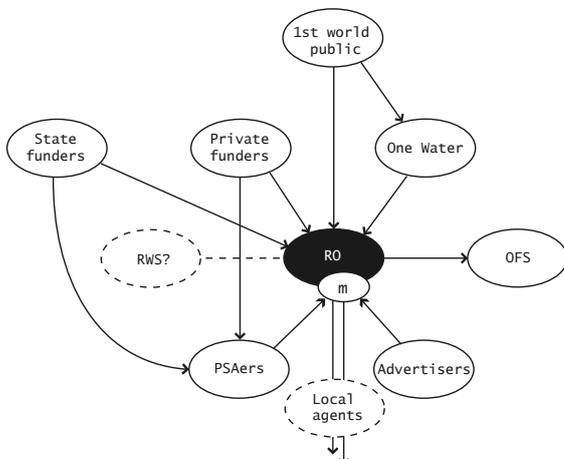
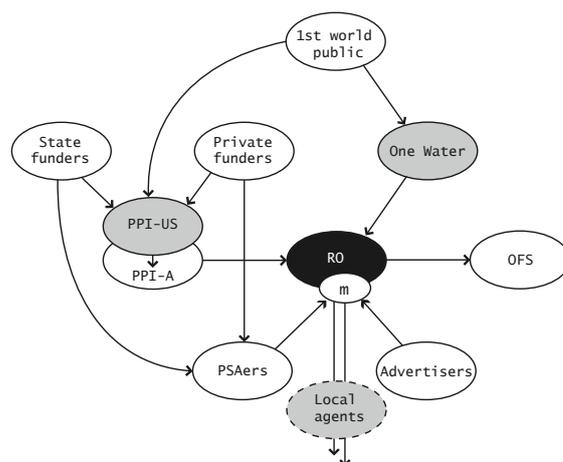


2003

Field establishes Roundabout PlayPumps (RPP) as a non-profit organisation to facilitate the public donations, including from the public in Europe and America, and sets up Outdoor Fabrication and Steel (OFS) as a separate company to manufacture the *PlayPump*. RO now uses advertising funds solely for maintenance (m), with donations paying for the manufacture and installation of the system.

2006

PlayPumps International US (PPI-US) is established by the Case Foundation, to raise funds for the *PlayPump*. RPP is renamed PlayPumps International Africa (PPI-A), and comes under the influence of PPI-US, for whom it manages payments to RO. One Water started funding the *PlayPump* in 2005, via RO. RO is by this time installing *PlayPumps* outside South Africa, and employing local agents to do some of this work.



2010

PPI-US withdraws from the project, and takes down its website. PPI-A had already severed ties with RO over internal disputes in 2008. RO continues to receive funds from One Water, and to seek further investment in the project; possibly through Roundabout Water Solutions (RWS), the nonprofit it set up to replace PPIA. RO continues to manage billboard advertising and maintenance.

Fig 7.8: The changes over time to the removed parts of the *PlayPump* system, demonstrating their fluidity.

International Africa); and the state of the system after the Case Foundation dropped the project and dissolved PlayPumps International (US) in 2010. These changes indicate that while the *PlayPump* on the ground is not particularly fluid over time, the *PlayPump*'s removed networks are.

We can note that whereas the changes over time to the Zimbabwe Bush Pump are in response to what Morgan has learnt from users in the field and from intensive testing of its mechanics, in a continual process of review and reassessment, the changes over time to the *PlayPump* system have been to events happening away from the *PlayPump* on the ground. The establishment of the nonprofit body Roundabout PlayPumps in 2003, for example, was in response to increased donations to Roundabout Outdoor, which was due to the international visibility they gained through the World Bank Award.

The chart is somewhat simplified⁹, due to the complexity of the system and thin or conflicting information about some changes. Seeing the network clearly was a problem even for bodies connected to it – as SKAT's mission in Mozambique commented: “The mission found that it was not clear for national stakeholders to understand the organizational structure related to the PlayPumps at international level” (Obiols & Erpf 2008, p.28).

In this way we might apply De Laet and Mol's description of the Zimbabwe Bush Pump's boundaries as ‘vague and moving’, to the *PlayPump*'s network of removed bodies: another way in which it is fluid. And this part of the *PlayPump* has the other quality De Laet and Mol derive from its fluidity over time – it is robust, with Roundabout Outdoor maintaining connections to funding at each stage, and holding the centre of the network even as major funding opportunities collapse. What fluidity the *PlayPump* system has, so far in our analysis, is in the removed parts of the system, rather than in the system on the ground. The case for this analysis will be made stronger as we continue to locate the fluidity of the *PlayPump* through examining its ‘working order’, later in this chapter.

⁹ For example: Field mentioned that early on Roundabout Outdoor “used to have about 6 companies”, before they incorporated them together (London 2007); when PlayPumps International Africa split from Roundabout Outdoor over internal disputes in 2008, it is not clear how PlayPumps International (US) carried on funding either body; One's primary relationship is with Roundabout Outdoor, or with Field anyway, but it is not clear exactly what route their payments follow; and it is possible that Roundabout Outdoor is now receiving donations through the nonprofit organization they established in April 2008 to replace PlayPumps International Africa, Roundabout Water Solutions, rather than directly.

ii) What are we to make of the *PlayPump* as ‘continuous’ with other pumps working in similar contexts? De Laet and Mol demonstrate that the Bush Pump can be shifted through different categories or ‘families’ of pumps by choosing which features of the Bush Pump to emphasise, connecting it to other pumps both through what it has in common with them, and how it differs from them. Whatever features distinguish it from one example, may also connect it to another; “for the Bush Pump, being itself means that it is continuous with a number of others” (de Laet & Mol 2000, p. 231). This contributes to the appropriateness of the Bush Pump as it shares successful features of other pumps, in particularly effective combination.

The *PlayPump* too has features in common with other pumps: Roundabout Outdoor says that the *PlayPump* drives “conventional borehole pumps” (Roundabout Outdoor n.d.); UNICEF confirms that “the pumping principle is the same as a conventional reciprocating handpump” (2007, p.8); and Field says that before he saw Stuver’s design he was already interested in the windmill water pumps that are common across South Africa, wondering if they could be hand-cranked when the wind stopped (Eastman 2008) – he identified the *PlayPump*’s roundabout to a CNN reporter as “basically a windmill on its side” (Costello 2010c). The *PlayPump* can be located in this way in a broader family of pumps that includes conventional borehole handpumps and water windmills.

What separates the *PlayPump* from other pumps is most broadly the roundabout as an input, the elevated water tank it pumps to, and the inclusion of billboards that fund maintenance. The overall configuration of the *PlayPump* on the ground, with roundabout, water tank and billboards, is what separates the *PlayPump* from other pumps, and it is this overall configuration which Roundabout Outdoor claims as its intellectual property; though UNICEF, for one, seems somewhat sceptical of a claim at so broad a level, over components that are themselves likely to be unpatentable:

PlayPumps International reported that OFS holds the patent for the PlayPump® water system in South Africa, Lesotho and Botswana. It was reported that this covers the entire system (roundabout pump, tank and standpost). It is not clear as to what unique functions are patented, however... (UNICEF 2007, p.8).

But what are the consequences of this novel configuration, which sets it apart from other pumps, for the performance of the *PlayPump*? We already know what benefits are advertised for the system, from our work in Chapter 2: Design for development; and we also now know the major faults in the *PlayPump* system identified earlier in this chapter. If we take each of the

novel components in turn – roundabout, water tank and billboards – we can map what the consequences of these unique features are for the performance of the pump, and how they connect or set apart the *PlayPump* and other pumps operating in similar circumstances.

The roundabout as a means of driving the otherwise conventional pump sets the *PlayPump* apart from other pumps not just in the way its makers intended, as an apparent way to accomplish work through children’s play, but in drastically reducing the rate at which the pump can pump water, as a consequence both of the shortened pump stroke, and the difficulty of turning the roundabout’s wheel for an adult. From the comparisons arrived at earlier, the *PlayPump* seems to pump water 3 – 5 times slower than the equivalent AfriDev or Zimbabwe Bush Pump. Owen writes that one could conservatively assume that *PlayPumps* “are half as productive as a conventional pump” (Owen 2010b). Whereas what set the Zimbabwe Bush Pump apart from other pumps that use a similar mechanism was its exceptional competence, what sets the *PlayPump* apart is its inferior performance.



Fig 7.9: ‘Pressure Type Bush Pump’, which appears to incorporate a tap to draw either from the storage tank or directly from the well-head (Erpf 1998).

The *PlayPump*’s use of a water tank, and the distance between its pump and faucet, separate it from most other pumps, which release water directly from the top of the borehole. While intended to enable water to be collected over time through children’s play, it has had the

unintended consequence of increasing the work for the user when the tank is empty, because of the distance the water has to be pumped, especially upwards to the tank. This difference to other pumps has a negative consequence. But this consequence could have been designed for: Erpf mentions a Zimbabwe Bush Pump ‘Pressure Type’ in development in 1998, “that is able to pump water directly into overhead stored water tanks” (1998, p.14). In his photograph of the Pressure Type Bush Pump, reproduced in fig 7.9, previous page, there appears to be a tap situated so that water would flow either from the tank, or could otherwise be pumped directly from the well-head. This fluid allowance for variation in its circumstances of use we know to be typical of the Zimbabwe Bush Pump. It demonstrates the possibility for a similar design affordance in the *PlayPump*, a faucet to bypass the empty tank, if this circumstance is provided for.

The *PlayPump*’s billboards are included in the system to ensure that there is money to pay for maintenance of the system by Roundabout Outdoor or their contractors in other countries; it is an alternative, service-based approach to the problem of maintenance than the Zimbabwe Bush Pump’s approach, which has been to make users more capable of repairing their pumps themselves. No foolproof approach to the widely acknowledged problem of maintenance for development projects has been found, and approaches to making users capable of maintaining their own technologies have also foundered. But relying on advertising as a source of income for maintenance introduces its own particular vulnerability to the system. PlayPumps International CEO Gary Edson acknowledged the impact of the global economic crisis on advertising sales for the billboards, as described earlier; so global events outside of the control of the users of the pump compromise the funding available for its maintenance. UNICEF noted that Roundabout Outdoor was not transparent about its use of advertising revenue from the billboards, and advised that local groups be given control of the advertising and maintenance, especially as the programme was proving unsuccessful. The ‘difference’ between the *PlayPump*’s programme for maintenance, and that of other pumps, which aim to make users more capable of maintenance, did not seem to make significant inroads to this well-recognised problem.

In relying on a service-based model for maintenance, funded by its billboards, the *PlayPump* has also bypassed the technological developments in pump maintenance made by other handpumps. Where both the Zimbabwe Bush Pump and the India Mk II, the most widely-used handpump in the world (Morgan 2010), have introduced ‘open top’ versions that allow easier maintenance without lifting the rising main, the *PlayPump*, somewhat perversely given the publicly-available work that has gone into designing for this problem, requires not only the

rising main to be raised, but the concrete platform around the roundabout to be demolished to accomplish maintenance of the down-hole parts. This makes the *PlayPump* more similar to the first Murgatroyd pump, which before it was redesigned in the mid-1960s could only be removed from its base by destroying the concrete apron, than the later A and B-type Bush Pumps. This system “is not a smart idea”, and SKAT regarded it as “a non satisfying solution” (Obiols & Erpf 2008, p.34).

For every removal of the rising main (i.e. for maintenance of cylinder parts), a specific section of the platform [concrete apron around the roundabout] needs to be demolished, to disconnect the pressure pipe that leads to the overhead tank. Each time a repair or maintenance intervention is completed, the platform has to be closed with a layer of cement mix that requires a curing time of about one week (Obiols & Erpf 2008, p.22).

The down-hole components of the *PlayPump* are also different to those of other pumps operating in the same locations, with unfortunate results: *PlayPumps* in Mozambique had rods made from a combination of metals that corrode each other, exacerbated if the water is acidic – the AfriPump, long established in Mozambique, avoids this problem with its combination of plastic and metal.

Way back in the early 90-ties, the Afridev Handpump was selected as the national handpump [of Mozambique]. One of the reasons was the corrosive waters in large areas of Mozambique and the Afridev with non-corrosive down hole components (PVC risers and Stainless steel pumprods) was the best option to solve this problem. With installing of *PlayPumps* with GI [galvanized iron] risers and Mild steel pumprods, it seems that this problem has been overseen or neglected (Obiols & Erpf 2008, p.32).

What sets the *PlayPump* apart – its unique features – turns out to be a hindrance to the user; and where it could have learned from other pumps, in bypassing the water tank, using appropriate materials for acidic water, or allowing the down-holes parts to be repaired without lifting the rising main or destroying the concrete platform, it didn't. We can note that in contrast to the Zimbabwe Bush Pump B-type, which has “the same successful details in common” with other Bush Pumps (Erpf 1998, p.8), and performs exceptionally well in relation to other types of pump, the *PlayPump* lacks successful features of pumps in the same general family as itself. The *PlayPump* does not partake in the stream of expertise that has been developing around water pumps operating in similar circumstances. As a result it has flaws

that could have been avoided if learning from other technologies like it. Its dissimilarity with other pumps working in similar contexts makes the *PlayPump* less appropriate: it sets it apart, defines its difference. Here too the physical *PlayPump* lacks fluidity.

iii) The *PlayPump*, like the Zimbabwe Bush Pump, can be described as including other objects within its boundaries. We have already noted the network of removed bodies connected to the discrete physical object. For the individual *PlayPump* installed in the field, other bodies within its boundaries, as in De Laet and Mol's description, include the constructions to house it: the concrete apron around the roundabout, and the borehole it is sited on; the water tower that needs to be erected on concrete foundations; the stand pipe to be cemented into its drainage trough. It also, like the Bush Pump, embraces some of its users within its boundaries: children are needed to play on the pump, and it has some success in attracting them to do so, though no matter how much they play on it, they can't meet the demand for its water. On the level of representation, of course, children are an integral part of the *PlayPump*, and it is seldom depicted without them.

But the *PlayPump* doesn't rely on the community it is meant to serve to the same extent as the Zimbabwe Bush Pump: adults are not considered in the design of the roundabout, and find it difficult to use as a result. The community does not choose where it is to be sited, or build its foundations – actions which De Laet and Mol tell us are important in bonding the users to the pump. The users relation to the pump for maintenance is mediated through the most important removed body from the pump, Roundabout Outdoor. Users connect to Roundabout Outdoor through SMSes or phone calls to report faults, and on to the pump through the services of the repair team sent to maintain it. These are, it seems, weak links, with many users not knowing how to contact Roundabout Outdoor; with reports going unanswered; and repair teams arriving late if at all. The consequence, as De Laet and Mol predict, is that the pump does not work very well; it fails to embrace the community, as it does not rely on them, and they cannot rely on it. "Poor community mobilization before installation of the PlayPumps", writes Erpf, "had the fatal consequence of poor knowledge about how to communicate breakdowns, making the repair service provided by Roundabout Outdoor and its local contractors inefficient" (Obiols & Erpf 2008, p.29)

De Laet and Mol tell us that when NGOs or governments are determined to keep the siting of pumps entirely in their own hands, that can be fatal for a well. Users, we know, are not effectively consulted about the siting of *PlayPumps*. For the *PlayPump* in Mozambique and in Zambia, many sites were poorly chosen, as both UNICEF and SKAT's reports describe, and as a result some installations had problems right from the start: "poor performance in

borehole siting or identification has drastically affected the quality of water and increases the number of breakdowns of the pumps” (Obiols & Erpf 2008, p.28). In both countries these poor choices were blamed by Roundabout Outdoor on their local contractors, and teams in both countries were dismissed as a result of poor work. But both SKAT and UNICEF were critical of Roundabout Outdoor for the nature of the relationships they established with these contractors, from which poor work was a systemic result, rather than just a matter of incompetent individual consultants. Consultants were paid a sum of money to locate a certain number of existing boreholes in a region, for *PlayPumps* to be sited on; poor results from this approach included working pumps replaced, and non-working boreholes chosen. “The lack of close monitoring and quality control made it possible that several local partners, only driven by the ambition of easy money, had taken advantage of presenting poor quality work. The consequences are high costs for the frequent repairs and complaints from pump users due to the lack of their involvement on the process” (Obiols & Erpf 2008, p.28).

As the *PlayPump* fails to embrace the community which is to use it, so Roundabout Outdoor’s relationship with local contractors in other countries also suffered from weaknesses; they were both too possessive of the maintenance system, in not creating more autonomous, locally-based teams, as UNICEF recommended they should, and not involved enough in vetting the quality of their work. Erpf’s team noted the poor quality of their relationships with maintenance and repair crews as a consequence of their being “based on short-term working contracts without long-term commitments. Contractors complain about difficulties and delays in payments and uncertainties on future commitments. Under such conditions a fruitful and long-term collaboration is difficult to achieve” (Obiols & Erpf 2008, p.38).

As De Laet and Mol predict, a consequence of the *PlayPump*’s failure to include the user community within its boundaries is the increased chance that the technology itself will fail. As Erpf echoes, “the beneficiaries of the new product will be the key point to decide whether the introduction of such a technology will be successful or not” (Obiols & Erpf 2008, p.45). And Roundabout Outdoor failed to ‘embrace’ their local contractors too, neither establishing long term relationships as Erpf’s team recommended they should, or setting up local installation and maintenance teams “that are accountable to communities, implementing partners and local authorities”, rather than just to Roundabout Outdoor, as UNICEF recommended (UNICEF 2007, p.16).

iv) In Zimbabwe, write de Laet and Mol, “government support for buying a pump may link up the village to the state, thereby enlisting villages in what is otherwise likely to remain an abstract nation”; as a locally designed and manufactured pump, the Bush Pump is well-suited

to the role of nation-builder (de Laet & Mol 2000, p.236). Its boundaries may then be described as coinciding “with those of the Zimbabwean nation” (de Laet & Mol 2000, p.237).

The *PlayPump* within South Africa is ‘locally designed and manufactured’, and it has been enlisted by the South African government as a means to supply water in rural areas. It does, though, conflict with South African government policy for water provision, especially if placed in a community rather than a school, as it is incapable of meeting the state’s free basic water policy. Its role in South Africa as a nation-builder is ambiguous: it may be enlisted by the government as such, but it will not necessarily perform this work well – and it is not likely, given its limitations, to bond citizens who use it to the state. This may tell us something about the South African state as well as the *PlayPump*; their advancement of the prepaid meter also failed to bond its citizens to it.

Outside of South Africa, the *PlayPump*’s problems multiply: in neighbouring countries, it not only contravenes state policies for the amount of water it should supply, but also policies for community-based maintenance (UNICEF 2007, Obiols & Erpf 2008). In Mozambique, “the concept of the PlayPump and its maintenance and repair system does not comply with the VLOM [Village Level Operation and Maintenance] concept applied in the country” (Obiols & Erpf 2008, p.28). “The current PlayPumps International implementation strategy clearly contravenes several Government policy directives and water sector development principles common to the countries under consideration” (UNICEF 2007, p.14).

The shortcomings in the maintenance system for the *PlayPump* were in part a result of Roundabout Outdoors’ insistence on centralizing administration with itself outside of countries where *PlayPumps* are installed, undermining the power of local authorities. The pressure under which PlayPumps International placed the governments of recipient countries to accept *PlayPumps* likewise undermined the state’s relationship with their citizens, who were subjected to the rollout of an inferior technology. In Mozambique, “performance problems and poor quality installations gave raise to complaints from communities to local government level” (Obiols & Erpf 2008, p.216). Here the *PlayPump* failed to strengthen bonds between the state and the people, as it created dissatisfaction and anger amongst users, with communities petitioning the government over its shortcomings in the programme. The *PlayPump*’s boundaries do not conform to any nation’s – it is a transnational object that ignores the specific contours of a nation’s boundaries and frameworks.

7.5.2 ...of its working order...

The *PlayPump*, like any pump, will break. That it breaks is not in itself damning; but how well an appropriate technology copes with its own breakdown is crucial, and is the focus of de Laet and Mol's analysis of the 'working order' of the Bush Pump. The 'working order' of the Zimbabwe Bush Pump, de Laet and Mol tell us, is not a binary matter of either success or failure: "there are many more relevant answers to this question than a simple 'yes' or 'no'" (2000, p.252). This is a feature both of the pump itself, which is resilient under changing circumstances, and of appropriate ways of evaluating its performance in relation to context, rather than based on 'laboratory' standards away from the field. Both the resilience of the pump and its evaluation, they tell us, require fluidity. Our analysis below is in 5 parts, based on the order of analysis in Chapter 3: i) compromising some ends to achieve others; ii) resilience in the pumps's configuration; iii) availability of spare parts; iv) community; and v) standards.

i) The resilience of the Zimbabwe Bush Pump requires compromise. De Laet and Mol describe the compromises Morgan made to the performance of the pump in order to make its maintenance more possible for users, so minimizing the damage to the pump and its concrete apron when the rising main is lifted, and reducing the time the pump is idle waiting for expert help. By using a narrower gauge cylinder and lighter pump rods, it may pump less water per stroke, but for the long-term performance of the pump, "the trade-off is beneficial" (de Laet and Mol 2000, p.240). Morgan's redesign contributes to the ability of the pump to keep on working, with less possibility of damage to the installation and less downtime waiting for outside help.

The *PlayPump* makes a similar compromise to enable children to push the roundabout around more easily: "With greater installation depths the pump effort is increasing and therefore cylinders with smaller diameters are used to assure that pumping (turning the play wheel) is still fun for the playing children. However, the use of smaller cylinders sizes automatically reduces the water discharge" (Obiols & Erpf 2008, p.33). This is not the only compromise made by the *PlayPump* – we will examine here some of the compromises and payoffs in its design and performance. Despite its obvious faults, evaluating the *PlayPump* is not a binary matter any more than it is for the Zimbabwe Bush Pump; we need to weigh what is achieved and lost in the compromises made for its unique configuration.

In using children's play as the input to the pump, Roundabout Outdoor chose to conceal the pump completely within the roundabout. This it does well – the pump is invisible, concealed unobtrusively within the blue disc on top of the roundabout. This is presumably a good thing

for the children using the roundabout, so as not to expose them to moving parts. But it does not lend the pump to the kind of user-directed repair or modification invited by the “open arrangement” of the Bush Pump’s headgear (Erpf 1998, p.22). The *PlayPump*’s headgear is only to be uncovered for repair by employees of Roundabout Outdoors, or their agents if the pump is installed outside South Africa. So the pump is not fluid in this way: it does not enable repair by its users, and so when it breaks, there is little its users can do but report it and wait for a maintenance team to arrive.

Concealing the pump within the confined space of the roundabout had the other consequence of hindering its performance, as it decreased the pump stroke to such an extent that it pumps water at a far slower rate than other pumps. This conflicted with the purpose of the roundabout to harness the energy of children’s play, as it made sure that children’s play alone could not meet the needs of the community. It necessitated adults adding their labour to the task of pumping water, putting them sometimes in competition with children for the use of the roundabout. And when turned by adults by hand, the wheel is difficult to use. This compromise, designing a pumping mechanism that could be hidden inside the roundabout, introduced hindrances that outweighed its benefits to the user, both because it contributed to the pressures on the pump, making it unlikely that its ability to be operated through play would be of benefit, and in removing the possibility for users to maintain or repair the pump when it breaks down.

Separating the input – play – from the output – water pumping – necessitated the introduction of a tank to collect the water produced while children play on the roundabout. But the elevated water tank makes for more work for the user when the tank is empty. The two effects of the water tank: enabling asynchronous playing and water collection, vs. introducing more work for the user when the tank is empty must be weighed against each other. Judging from reports, as a result of the slow pumping rate combined with exaggerated claims for the number of people it can supply, the *PlayPump*’s tanks are empty most of the time: so the benefits of this compromise too seem to be outweighed by the hindrance to the user.

The negative impact of the water tower might have been lessened had Roundabout Outdoor made another kind of compromise: reduced the height of the 7-metre tower. Some reviews of the *PlayPump* suggest that the tower is higher than it needs to be to maintain water pressure at the standpipe. A visitor to Owen’s blog commented “That tank looks pretty high... It makes me wonder if they need that much pressure to fill a bucket” (Owen 2009b). Erpf’s report from Mozambique suggests that “costs could be reduced by using a 3 m water tower (enough for feeding water taps nearby)” (Obiols & Erpf 2008, p.48). This, the report says, should be

possible if the billboards are used for public health messages only, where the people using the system for water could read them easily – the implication being that the tower is as high as it is because of its purpose for commercial advertising, presumably in order to make the billboards visible over a larger area, increasing the audience for the billboards beyond the users of the pump. This is another example of how a compromise that might have been justified, had the system worked exactly as intended – using income from advertising to fund maintenance, which could benefit the user – ends up outweighed by its negative effects: commercial advertisers did not rent many *PlayPump*'s billboards, so little benefit was gained by making the tower higher. The *PlayPump*, unlike the Zimbabwe Bush Pump, seems not to have incorporated the possibility of its own breakdown (de Laet and Mol 2000).

The roundabout and water tower have disadvantages that would seem to outweigh their benefits to the user. But there is a gain the *PlayPump* seems to have made that is potentially of benefit to its working order. Though the evidence is somewhat conflicted, both UNICEF and SKAT's reports say that the *PlayPump* is robust, and may break down less than other pumps as a result – the high incidence of faults in Zambia and Mozambique being perhaps more to do with poor siting and installation than the mechanics of the pump itself. “The PlayPump® has a low breakdown record due to its robustness, compared to commonly used handpumps in rural communities (Afridev, India Mark II etc.)” (UNICEF 2007, p.8). Erpf records the “remarkable” comment of one user, who told him “We like the pump for its reliability with less repair interventions, but please replace the play wheel with a handle to draw water” (Obiols & Erpf 2008, p.25). But what compromises in the working order of the pump were made in order to achieve this robustness? And would it be possible to fulfill this user's request?

Part of the reason the pump may be more robust, I argue, is that the pump is more protected from the user than are other handpumps. The pump is robust because of the roundabout, whose resistance acts to limit the force of the user, and replacing the roundabout with a handpump would negate this ‘benefit’. The strong and heavy roundabout wheel, with the working parts of the pump sealed within it, acts as a buffer between the pump and the user, which makes it harder to break, but also makes it more difficult to operate. If the wheel was replaced by a handpump, it would make it easier to use, but also more vulnerable. The Zimbabwe Bush Pump's open configuration makes it potentially more vulnerable to use and to the environment, but the gain identified in this by de Laet and Mol is that it enables user modification and repair. If we consider that the *PlayPump*'s concrete foundations needs to be destroyed to access the down-hole parts, we could well imagine that it is stronger and hardier

than other pumps – but as pumps inevitably do break down, how easy they are to repair is as important as how strong they are. Finding a point on the spectrum between hardness and openness seems to be key to an appropriate technology's success.

ii) The Zimbabwe Bush Pump can survive the loss of some parts and still keep working, and its parts can be replaced by nonstandard objects – Erpf admired the use of rebar rods used instead of bolts in one Bush Pump he observed. Because of the *PlayPump's* sealed headworks, users cannot modify it, and so the fluidity of its working order is reduced. When it does break down, the fault is more mysterious to users than the Bush Pump's, as all working parts of the pump are hidden from them. But when parts are taken away or connections broken in the *removed* parts of the *PlayPump* system, they are replaced or rerouted to keep the whole operation going. In examining the *PlayPump's* boundaries, this network was identified as fluid because it shifted and changed over time, and because it had some of the qualities of fluidity discussed here: the ability to keep on working in the face of breakdown. As we located fluidity over time more in its removed parts than in the mechanical configuration of the *PlayPump*, so too we find more fluidity of its working order in this distant network of bodies.

When PlayPumps International Africa broke off their relationship with Roundabout Outdoor in 2008, citing their dissatisfaction with the maintenance of *PlayPumps* (Obiols & Erpf 2008), and with Roundabout Outdoor complaining that PPI Africa was failing to secure Memoranda of Understanding from governments for the installation of *PlayPumps* (Melman & Morris 2010), Roundabout Outdoor immediately formed another nonprofit entity, Roundabout Water Solutions, to replace it (Obiols & Erpf 2008). When PlayPumps International (US) ended their support of the project, taking away a major source of funding, Roundabout Outdoor kept on functioning. It was able to do this because of the robustness built into the network: Roundabout Outdoor has always maintained its own connections to state and NGO funding via its billboard rentals (from which it profits) even after it transferred fund-raising to a non-profit entity in 2003; and because it established its relationship directly to One in 2005 (One CEO Duncan Goose and Field are friends), it remains a major source of international funding, and a route to a first world audience, after the dissolution of PlayPumps International. Or further back, in 2003, when Roundabout Outdoor established Outdoor Fabrication and Steel (OFS) to manufacture the system, it both retained 60% shares in the company (Obiols & Erpf 2008), and had OFS offer a year's guarantee on the *PlayPump*, distributing the financial responsibility for its maintenance.

The system is also robust in the way that it protects parts of the system from failure in other parts. The system for funding maintenance of an installation through the rental of its

billboards is referred to by UNICEF's chief of water, sanitation and hygiene Clarissa Brocklehurst as “a closed loop, where the pump itself would be a source of income in order to support O and M [Operation and Maintenance]”, and UNICEF was interested in it for this reason (Costello 2010a). As it turned out, this was not an effective mechanism for making the *PlayPump* on the ground sustainable; but this ‘closed loop’ in the *PlayPump* system could equally be seen as of benefit to removed bodies, as it protects them from the demands of the pump on the ground, limiting the amount of funds it can draw from the overall system.

As in our inspection of the ‘boundaries’ of the *PlayPump*, we find flexibility in the working order of the *PlayPump* more in its removed networks than in the physical object – which may be robust, as described earlier, but cannot cope as well with breakdown in its parts.

iii) A feature of the Zimbabwe Bush Pump that helps to turn “‘being broken’ from a final state into an intermediate stage”, contributing to the fluidity of its working order, is that because it is locally produced in Zimbabwe, and a national standard, spare parts are easily available (de Laet & Mol 2000, p.240). The *PlayPump* may be ‘locally made’ when installed in South Africa, but when it travels outside of South Africa it is no longer local. All components for the pumps are transported from South Africa to countries such as Mozambique and Malawi, and as a new pump, there is no existing support base for parts. The *PlayPump* outside of South Africa does not have the benefits of a local pump with easily available spare parts, or the existing supply chain that longer-established pumps – such as the AfriDev in Mozambique – would have. According to Field:

...every part of the machine is put together at our factory, and every nut and bolt is counted and double-counted and checked into a nylon sack that's got all the little bits and pieces in it. You don't want an installer to be 300 or 400 kilometres from Dar es Salaam in the bush trying to install this thing, and then he finds in his sack that he's missing two bolts. That makes it a tad of an operational problem, you know. We have to send up spare units and spare parts for the installers. The model we use is basically the same in every country as it is in South Africa (Greene & Stellman 2009, p.173).

Field's description emphasizes how specific the configuration of the *PlayPump* is, how little is done to tailor the *PlayPump* to different national contexts, and how small the material support base is for the *PlayPump* in the field. SKAT's report from Mozambique argued that the project would benefit from “identifying the characteristics of the product and repair service from the perspective of the pump users and policy requirements in Mozambique” (Obiols & Erpf 2008,

p.28). UNICEF too urged Roundabout Outdoor and PlayPumps International to consider allowing local manufacturer of pumps, and establishing a local support base for their maintenance (2007). The *PlayPump* in its newness, and the way control is so centralized with Roundabout Outdoor in Johannesburg, suffers from the lack of a material support base for it, especially outside of South Africa – and so ‘being broken’ is likely to be a longer state for it than the Zimbabwe Bush Pump.

iv) The Bush Pump “requires a community to maintain it if it is to work” (de Laet and Mol 2000, p. 245). The strength of its relationship with its community around it will affect how well it is sited, installed and maintained – the degree of success of the pump is dependent on it being ‘attractive’ enough to be a centre; on creating the community it needs. The impact of the *PlayPump*’s ‘attractiveness’ on its ‘working order’ is largely limited to its ability to attract children to play on it. It seems to do this fairly well, but as noted, no matter how well it accomplishes this part of its operation, other limits in the system prevent users from being satisfied by the output of the pump. Because it does not rely on the community for installation or maintenance, the need to ‘attract’ them is less for the PlayPump. But the community does need to contact Roundabout Outdoor or their agents for repairs when the pump breaks down; and even here the *PlayPump* has problems, especially if outside South Africa. While ‘making a community’ around itself may not have as much impact on the performance of the *PlayPump* as the Bush Pump, as users do not install or maintain it, it is worth noting that the PlayPump does not make for satisfied user communities. Perhaps if its successful operation was dependent on doing so, as de Laet and Mol say it is for the Zimbabwe Bush Pump, the *PlayPump* would engage user communities more, and perform better.

v) De Laet and Mol draw attention to the question of ‘hygienics’ in assessing the working order of the Zimbabwe Bush Pump, contrasting the standards formulated in first-world laboratories for measuring water quality to experiences of water supply in the field in Zimbabwe. A pump installation’s water quality may vary by time of year; the safety of the water’s *E coli* levels will be influenced by the number of users of the installation; and they note that alternatives available to users, rather than absolute standards, should be taken into account in evaluating a pump’s performance.

The context for the individual *PlayPump* does influence how well it works – here there is fluidity of a kind in its working order. It works better when it is only used to supply school children with water for drinking and washing their hands – less than 5 litres a day each. When the *PlayPump*’s water is shared between a school and a community, or is for the general use of

a community, its performance suffers. This is partly a matter of standards – it ‘works better’ because the standard for minimum water supply is dropped for the school context, from 20 or 25 litres per person to 5 litres per child while at school. Roundabout Outdoor’s inflated claims for how many people the *PlayPump* can serve can be partly explained by the ‘flexibility’ of their standards for water supply, which ignore recognized standards; when questioned by SKAT about their non-compliance with water standards in Mozambique, they replied: “This is the theoretical wish of WHO; we aim to provide drinking water less than 5 litres per person” (ibid).

Emphasizing the *PlayPump*’s suitability for schools over communities seems to be a recent tactic for Roundabout Outdoor, in retreat from negative publicity; the system was clearly marketed as suitable for shared use by schools and communities in the past. *One Water*, for example, has repeatedly emphasized since the withdrawal of PlayPumps International from the project that the problem with their administration was that they didn’t restrict *PlayPumps* just to schools. *One Water*, they say, only installs them in schools. Yet in April 2010, *One Water* announced on their Facebook page that “the site that has been chosen for your Facebook PlayPump is Chikumba F.P. School in the district of Thyolo, Malawi... The school has 1103 girls, 993 boys and 13 teachers and the pump will serve a community of 7300 people” (One 2010c). Erpf clearly identified *PlayPumps* shared between schools and communities as a bad idea, which could at the most supply water to 940 school children, and only an additional 235 people from the community; and only then if the *PlayPump* is in operation for 12 hours a day. The inconsistency – perhaps the nonchalance – with which the *PlayPump*’s makers and partners continue to express the capabilities of the system could be described as not ‘fluid’, but ‘slippery’.

Regarding the comparison between laboratory standards and standards ‘in the field’, we can observe that PlayPumps International, Roundabout Outdoor, and their partners all relied on and reproduced figures for the *PlayPump*’s performance that seem to have little relationship to the actual performance of the *PlayPump* in the field. The discrepancy in the pumping rate advertised for the system cannot be explained simply by the difference between a laboratory standard and a measurement in the field, however: Erpf performed an idealized, math based analysis of the pump’s capabilities which still fell short of the manufacturer’s claims. It is not clear where Roundabout Outdoor derived its single figure (1,400 litres per hour) for the *PlayPump*’s performance from, or how it is possible that it is so *far* wrong.

In examining the *PlayPump* earlier in terms of what compromises it makes in its performance, and what the results of these were, we were engaging in the type of complex evaluation

advised by de Laet and Mol. They also suggest taking into account what alternatives are available to users, when making an evaluation. And the satisfaction of users with the *PlayPump* does vary according to what alternatives are available: users who have never had a borehole pump before, or whose previous pump broke down often, may like it; the majority of those who have experienced other hand-pumps generally do not. For instance, in Mozambique:

There was only one case, in which communities showed satisfaction for the free maintenance and repair service of the PlayPump. This community had an Afridev Pump before, which had frequent breakdowns and the costs for repair was above their capacity to pay (Obiols & Erpf 2008 , p.39).

Here on an individual level, we have confirmation of de Laet and Mol's hypothesis about comparisons – though this is an isolated example that demonstrates only that the *PlayPump* is acceptable to users who have had particularly bad experiences of other technologies. In terms of general standards of evaluation, being as charitable as we can be, the *PlayPump* is still a severely compromised technology. And as for the shifting claims it makes about the number of people it can supply, which rely on no recognized standards for water provision, and its exaggerated performance claims which have no apparent evidential basis: we might describe these, as suggested earlier, as 'slippery' rather than fluid.

7.5.3 ...and of its maker.

De Laet and Mol attribute part of the fluidity, and so the success of the Bush Pump, to its maker, Peter Morgan. They refer to "The Place of the Maker" as "The Centre of the Zimbabwe Bush Pump Distributed" – Morgan does not hold on to the pump, asserting his authorship and central role, but dissolves into his surroundings, attending to but not controlling the pump (2000, p.248). In contrast, Trevor Field, Executive Director and founder of Roundabout Outdoor, discoverer-inventor and 'centre' of the *PlayPump*, very much asserts his ownership, and retains centralised control of 'his' invention. Below, the account of Field as 'maker', and what influence this has had on the *PlayPump*, is divided into 6 sections: i) the classical hero; ii) patents and pricing; iii) 'a government thing'; iv) users' insights; v) technology transfer; and vi) a man of action.

i) Whereas Morgan, who "never stresses the possible brilliance of his insights or the ingenious character of what he has created" (de Laet & Mol 2000, p.249), disavows his ownership, the narratives produced by Roundabout Outdoor and PlayPumps International emphasize Field's individual role as someone who saw what no-one else saw, who "suddenly... turned this

simple pump into an innovative, sustainable, child-friendly answer to one of the region’s most pressing problems” (PlayPumps International 2009a). Field’s online name for his Twitter account and personal ads is ‘mrfixitafrika’, elevating his personal role in addressing Africa’s problems. Other forums are happy to collude in this narrative of the classical hero, identified by De Laet and Mol as typical of “conventional technology studies” – and, we might assume, broader Western narrative tropes – “for all too easily marshalling the heroic agent as a bottom-line mover in... innovation and socio-technical change” (2000, p.256). The international design conference *Design Indaba* produced a depiction of Field in a promotional video for their 2006 conference in Cape Town, South Africa, which literalised this vision of invention. Illustrating PlayPumps International’s description of how Field first “spun the idea around in his head” (PlayPumps International 2009a), *Design Indaba*’s commercial looks into Field’s brain to show the *PlayPump* originating there, from where it is translated through his hand into the external object (see fig 7.10 below).



Fig 7.10 *Design Indaba* video (2006) depicting the *PlayPump* as springing from Field’s brain.

ii) Morgan and Field’s respective attitudes to patents on their pumps is a straightforward indication of a practical consequence of this difference in attitudes. Where Morgan “refuses to take out a patent on the pump” even though the B-type might have been eligible for his “exclusive property rights” (De Laet and Mol 2000, p.249), Field vigorously protects his patent on the *PlayPump*. “We have trademarks in every country where we believe it will be used in the world” said Fields. “We’ve had an outfit copy our system completely in South Africa. And we informed them they were infringing on our intellectual property via our patent attorney” (Eastman 2008). This despite UNICEF’s scepticism, as noted earlier, as to the patentability of the *PlayPump*. Their skepticism derives from their impression that Field, like Morgan, is in fact building on existing work by others.

A benefit that De Laet and Mol identify in Morgan’s refusal to patent the Bush Pump is its resultant affordability: users – “be it actual users, donors or governments” – pay only for the materials and production costs; they do not pay for the rights to use it, “for a name, for legal and maintenance fees, for the overhead of patent institutions, or for the investor’s retirement

pension” (2000, p.249). As a result, the Bush Pump is cheap, costing in 1997, according to Erpf, in the range of US\$390 – 460, depending on the gauge of the pump (1998). By 2010, this cost had risen to approximately US\$1,200 (Morgan 2010). These costs are for the above ground and below ground components of the Bush Pump, and do not include transport and labour.

Evaluating the cost of the *PlayPump* has not been easy for partners to the project, because PlayPumps International and Roundabout Outdoor have been reluctant to supply a breakdown of costs to their partners (UNICEF 2007). But Erpf’s unreleased report from 2008 does include a table of costs that make up the figure of US\$14,000 asked from sponsors, using figures supplied by PlayPumps International Africa. US\$2,800 was allocated to site selection and borehole identification; US\$5,600 to storage, transport and installation; and the *PlayPump* itself “with supplement[al] equipment” was priced at US\$5,600. We can compare this last figure of US\$5,600 directly to the Zimbabwe Bush Pump, and the AfriDev, both of which cost US\$1,200 for hardware. The *PlayPump*’s above and below ground hardware costs 4 to 5 times as much as the Zimbabwe Bush Pump or AfriDev, bearing out WaterAid’s assertion that four conventional handpumps could be bought for a single *PlayPump*. De Laet and Mol’s prediction that a patented pump will cost more to users than unpatented seems to hold true – and so the high price of the *PlayPump* would seem to be in part a consequence of Field’s assertion of ownership of the pump. In addition, Erpf comments that the installation cost, including transport, for the AfriDev pump is normally US\$500 – 1000, compared to US\$5,600 for the *PlayPump* (2008).

Costing	PlayPump	AfriDev	ZBP B-type
Hardware only	US\$5,600	US\$1,200	US\$1,200

Fig 7.11: Comparison of the cost of the *PlayPump*, AfriDev and Zimbabwe Bush Pump B-type, hardware only.

iii) Morgan attributes the capabilities of the pump to it being a ‘government thing’, developed on government time, rather than belonging to an individual. The *PlayPump* may often be funded by governments, but it is not ‘a government thing’ in Morgan’s terms. It is a product of private business that enters into public-private partnerships, while control of the project resides with Roundabout Outdoor. Governments are unable to make it conform to their standards, and they cannot reproduce it themselves or effectively influence its development. The language used by Roundabout Outdoor is the language of private enterprise: Field conceives of local contractors as ‘franchises’ (Gingerich 2008); and the responsibility of

Roundabout Outdoor to maintain pumps is expressed on their website as a commitment to their advertising customers, rather than to users: their commitment to maintain the pumps is assured because of “a contractual obligation to our advertisers”, for whom “Roundabout services the sites at regular intervals for general maintenance on the signage” (Roundabout Outdoor n.d.).

iv) Where Morgan, when travelling through Zimbabwe inspecting pump sites, is interested in seeing how users have modified his pump installations, ceding some control to them, operation and maintenance of the *PlayPump* is “dictated by Roundabout Outdoor in South Africa” (UNICEF 2007, p.11). Keeping central control of maintenance rather than designing ways to devolve this to users has had negative consequences for the *PlayPump*, as reported by UNICEF and SKAT. This could be seen as an extension of Field’s ‘holding the centre’ rather than distributing it. Where other bodies are allowed to maintain the pumps, these are commercial arrangements with vendors in other countries, between themselves and Roundabout Outdoor, not between Roundabout Outdoor and the users of the pumps, or the users of the pumps and the contractors. Because of this arrangement, users are dependent on outside parties to a greater extent than for the Zimbabwe Bush Pump, and there is no feedback from users to the pump designers, as there is for the Bush Pump. The consequence is that the *PlayPump* has never responded to the difficulties users have with it, or learnt from the way they might have adapted it to cope with these difficulties. “Implementation... requires room for [the users’] methods and insights”; otherwise, like the *PlayPump*, “it is all too common that the new and the foreign does not work, and that ‘all that glitters ... ends up as a rusty heap of useless technology” (de Laet & Mol 2000 p.77).

v) The increasing failure of the *PlayPump* as it spread further from where it started testifies to De Laet and Mol’s recognition that the “submissive” inventor “may help spread technologies just as well – or even better” than the inventor who, like Field, holds on tight, asserting his authorship (2000, p.256). Field has a fundamental misunderstanding of the problems involved in transporting technologies to other areas, problems by now well-established in studies of technology diffusion (De Laet and Mol 2000; Akrich 1997). He describes part of the value of the *PlayPump* system as “the replicability of the system” (Eastman 2008).

You know, we can take this system we’ve got here in our factory in Johannesburg, put it in a 747 and fly it into your backyard, so to speak. Actually, if we find a borehole that has a sufficient quantity of water and quality of water, even I could bop this thing together and it would work exactly the same in your backyard as it works in South Africa, or it would do the same in

India or China or anywhere else. Obviously, it won't work in the Arctic Circle or in the desert it would be so hot, you know, you wouldn't be able to touch it. But in fairly temperate climates it'll work anywhere (ibid).

Field's ignorance of the problems technologies encounter when moved from place to place, is a factor of his training – a “veteran advertising executive” (PlayPumps International 2009a), rather than in water and sanitation – and an indication of how the role of the user in determining whether a technology will ‘work’ is ignored in the considerations of the *PlayPump's* producers.

vi) Finally, an aspect of Field's approach which is in marked contrast to Morgan's, and which helps to explain why the *PlayPump's* failures were not detected earlier, before they began to be rolled out on a massive scale. Morgan is cautious about releasing technologies into the field, and will do so only when they have been thoroughly tested. The B-type Bush Pump was only recognised as the new national standard and passed for rollout when it had been rigorously tested by a number of separate government departments. When I interviewed Morgan in Harare in 2010, he described his work on the latest variant of the Bush Pump, the ‘C-type’. He had developed this pump in response to a request from government to reduce the cost of the Zimbabwe Bush Pump further, and he had come up with some new innovations. One of these required using a length of rope as a connection in the headworks of the pump; and though this accomplished part of his objectives, it worried him because it made the pump vulnerable. As a result, he was still, even after monitoring a prototype of the C-type pump installed in a local school for the past three years, reluctant to pass it as a new standard handpump. The C-type has been on trial for much longer than the B-type, because he was certain about the B-type, and is still not certain about the C-type. It is “working magnificently in the school environment” he told me, “but out in the wilds, you don't know what would happen” (Morgan 2010).

Field, in contrast, rejects caution. When asked what his advice would be to other entrepreneurs who might want to follow in his steps, he said “Action; just got to do it... action is the best map; you can make the most detailed map... and it won't take the traveller anywhere... The person who's not made any mistakes has made nothing” (London 2007). “How anybody gets anywhere is that you just have to adopt the Nike slogan: just do it. You just go do it, and that's what I did” (Greene & Stellman 2009, p.177). When Costello asked him in 2010 if he had any misgivings about the way things had gone with the project, Field replied “It may have been a bit ambitious... but hey, you got to dream big!” (Costello 2010c). Morgan told me that it would be “immoral” for him to release a technology before it was

ready (2010). He might agree with Field about learning through mistakes – except Morgan would make and correct his mistakes *before* rolling out the technology to users; and he is also at hand to learn from how technologies are used in the field. Field is cavalier in rolling out a vital technology for other people to use in extreme circumstances, before thoroughly testing it, and in not monitoring or responding to how it is used.

Field as maker portrays himself, and other forums collude in it, as the heroic maker who individually innovates, rather than acknowledging the work of others. He asserts his patent to the pump, despite there being some doubt as to its patentability, which is likely to have contributed to the cost of the technology as de Laet and Mol predict. He benefits from government support of the project, but the project is not owned by the government, and so profit for himself and his company are added to the price, and governments cannot make it conform to their standards. He has not implemented any means for the users insights into the technology to feedback to the centre at Roundabout Outdoor, and he is ignorant of the problems that arise when technologies are transferred from one place to another. And he is, lastly, a ‘man of action’, who believes in action before planning, and rejects caution when rolling out his technology – leaving users to suffer his mistakes¹⁰.

7.6 Summary

This chapter’s analysis started with suspicions about the *PlayPump*’s claims. The *PlayPump*’s claims are first of all suspicious for three reasons:

1. The large degree of unexplained variation in the number of people the system is capable of supplying, as reported by partners to the project.
2. The *lack* of variation in the reported pumping rate of the system – there should be more variation reported for different well-depths and sizes of cylinder.
3. The fact that there is no evidence produced for any claims, and that there had been apparently no evaluation of the system by Roundabout Outdoor.

¹⁰ An additional frame through which to interpret Field’s and Morgan’s character is through observing the patronage (or, loosely speaking, funding) systems they inhabit: as mentioned in Chapter 3, Morgan’s self-effacing character is appropriate to the state-managed production system of the Zimbabwe Bush Pump; and Field’s flamboyant, self-aggrandising character is useful to gathering the high-level contacts needed to fund the *PlayPump* – as will be described in greater detail in Chapter 8: Reanalysing the *PlayPump* 2: critical lenses.

From these suspicions, comparison with the Zimbabwe Bush Pump's performance, which is validated by extensive testing, and comparison with standards for water provision in South Africa, revealed more specific grounds for suspecting the *PlayPump*'s claims:

1. It seemed strange that the pumping rate reported for the *PlayPump* should be so much higher than the Zimbabwe Bush Pump's, as it uses a conventional borehole pump, and amongst borehole pumps the Bush Pump is meant to be exceptionally high performing.
2. Through comparing how many people each pump is rated to supply, it is clear that the *PlayPump*, even at its reported pumping rate, would supply each person it is intended to serve with much less water than the Zimbabwe Bush Pump, if operated for the same length of time – even though both pumps are intended for similar contexts.
3. Even if operated for 10 hours a day, which seems a long time for children to consistently play on the roundabout, the pump would give each person it is rated to supply less than a fifth of the 25 litre daily minimum the South African government aims to supply under their 'free basic services' policy; and even the adequacy of this amount is questioned by activist groups such as the APF.

These suspicions could be arrived at through comparison with known data, without access to evidence about the *PlayPump*'s real performance in the field. This shows that there were grounds to question the *PlayPump*'s claims before such evidence became available. Once previously unreleased reports became available, these suspicions were confirmed, and more major faults identified in the system. These 10 major faults were extracted from studies and reports on the *PlayPump*:

1. The pump does not perform at the rate advertised.
2. It fails to meet recognised standards for minimum water supply.
3. Children's play is not the main source of input to the pump.
4. The roundabout is painful and undignified for adults to use.
5. The water tank is a hindrance to users.
6. Advertising on the billboards is not a secure source of revenue.
7. The maintenance system for the pumps is unsatisfactory.

8. Users were not properly consulted before installation.
9. *PlayPumps* often replace handpumps on existing boreholes.
10. The system is much more expensive than the alternatives.

As result of these faults, and the failure of the pump to supply sufficient water to users, many of the same effects that were noted for the introduction of the prepaid meter in Chapter 6 were observed: food-growing was curtailed; the work of women and children increased, with some needing to walk further to reach water sources; social tension and humiliation for users was engendered; and the old, pregnant and less physically able were particularly affected.

This new evidence was drawn into a comparison between the *PlayPump* and the Zimbabwe Bush Pump, through the lens of ‘fluidity’ – which according to de Laet and Mol’s formulation is a measure of the Bush Pump’s appropriateness. This detailed analysis showed us:

1. The fluidity of the *PlayPump*’s boundaries:
 - i) The *PlayPump* as a technology on the ground has not developed much over time, though its removed networks have, responding not to events on the ground, but to events and opportunities away from the physical object.
 - ii) Its novel configuration, which sets it apart from other pumps, had unintended negative consequences, reducing the performance of the pump. It does not partake in the stream of expertise that has been developing around water pumps operating in similar circumstances, repeating faults other pumps have addressed.
 - iii) As it does not rely on the user community to help install it, or choose where it is to be sited, it misses opportunities to bond the community to it. Without the support of the community, as De Laet and Mol predict, it has a greater chance of failure. Roundabout Outdoor failed to make their local contractors accountable to users either, and gave them neither enough autonomy nor a stable long-term relationship. This too contributed to the failure of the technology.
 - iv) The *PlayPump* has an ambiguous role in South Africa as a ‘national pump’: it has been supported by the government, but remains a creature of private enterprise. Certainly outside of South Africa it has failed to bond the people to the state, as it has overridden local government policies, and caused

complaints from users to their local authorities. Unlike the Bush Pump, its boundaries cannot be expanded to the size of the nation – or perhaps it knows no national boundaries.

2. The fluidity of the *PlayPump*'s 'working order':

- i) The *PlayPump* made compromises in its performance to achieve other ends; but where the Bush Pump gives up some aspects of performance to become more flexible, the *PlayPump*'s compromises had negative consequences outweighing their positive. The decision to house the pump in the roundabout had knock-on effects, making it more likely adults would have to use it, and that the tank would be empty. Its robustness came at the expense of repairability and ease of use.
- ii) Where the object on the ground lacked fluidity in its working order, the removed networks of the *PlayPump* had some of the characteristics of fluidity identified in the Bush Pump: when parts broke they could be replaced by other parts, and the system could keep working when parts were removed or connections broken. The network was robust, and had structures, such as a 'closed loop' for maintenance, to limit damage to it.
- iii) The *PlayPump* in its novelty, and as a consequence of how centralized the system is with Roundabout Outdoor in Johannesburg, suffers from the lack of a material support base for it, especially outside of South Africa: there are no networks for spare parts and repair, as there are for longer-established pumps. This reduces the possibility that the pump can be repaired quickly, restricting the fluidity of its working order, and making 'being broken' more long-term.
- iv) As noted under the 'boundaries' of the *PlayPump*, it fails to engage with the user community, and so they have no role to play in maintaining or repairing the pump when it breaks down, and this too reduces the spectrum between working and not working for the pump. If it did embrace the community, perhaps it would 'work better'.
- v) The standards used for the evaluation of the *PlayPump* are perhaps 'slippery' rather than fluid: the elasticity in the number of people it is rated to supply, for example, is largely a consequence of Roundabout Outdoor and *One Water* ignoring recognized standards for minimum water supply. A minority of users prefer it,

only when comparing it to particularly unsatisfactory past experience of handpumps.

3. The fluidity of the *PlayPump*'s 'maker', Trevor Field, in contrast to Peter Morgan:
 - i) Where Morgan refuses to take the role of heroic actor at the centre of technological change, Field is classically heroic, assuming sole authorship and control – a narrative that other forums are happy to collude in.
 - ii) Field's insistence on the pump as a patented invention, and the other overheads identified by de Laet and Mol as a likely result of this, must contribute to the high price of the pump.
 - iii) While the *PlayPump* has been sponsored by governments, and Roundabout Outdoor would like government to support the project through renting its billboards (Melman & Morris 2010), it is not 'a government thing' in the way the Bush Pump is: it is a product of private enterprise, and is more expensive as a result.
 - iv) Field does not learn from the way the *PlayPump* is used in the field, and so does not respond to users' insights to improve the pump.
 - v) He is ignorant of the problems involved in technology transfer, including the role of users in determining the success of a technology, believing the *PlayPump* will work the same anywhere in the world.
 - vi) Field is, lastly, a 'man of action', who in contrast to the caution Morgan shows in approving any technology for use in the field, believes in acting without a plan, thinking big, and making mistakes live in the field.

From this analysis of the *PlayPump*'s fluidity, we can say that the *PlayPump* on the ground, if fluidity is to be a measure of appropriateness, is not an 'appropriate technology'. To revisit the statement with which de Laet and Mol introduce their analysis of the Zimbabwe Bush Pump:

We find that in travelling to intractable places, an object that isn't too rigorously bounded, that doesn't impose itself but tries to serve, that is adaptable, flexible and responsive - in short, a fluid object - may well prove to be stronger than one which is firm (2000, p.225).

The *PlayPump* on the ground has imposed itself on communities, who were seldom, or adequately, consulted about its installation. It has not changed in response to the problems reported with the system. By design, it is not adaptable: working parts are sealed away from the user, in contrast to the Bush Pump's 'open configuration'. By holding on to control of the project, Roundabout Outdoor has reduced the response time for maintenance of its installations, and the possibility for a wider material support base for it. The *PlayPump*'s 'firmness', which makes it perhaps less vulnerable to breakdown, does not compensate for its lack of fluidity, which might have made it stronger.

But the systems that fund, manage and campaign for the *PlayPump*; these have some of the characteristics of fluidity: they are adaptable, flexible, responsive – and strong. If fluidity is a measure of appropriateness, then what are these removed parts of the *PlayPump* system 'appropriate' for, or to?

This question will be revisited in the conclusion to this thesis in Chapter 9, after the second half of our analysis of the *PlayPump*, in Chapter 8. This next chapter uses the perspectives of interventionist art, critical design, and developing world activism, as explored over Chapters 4, 5 and 6, as a series of 'critical lenses' for analysing the *PlayPump*.

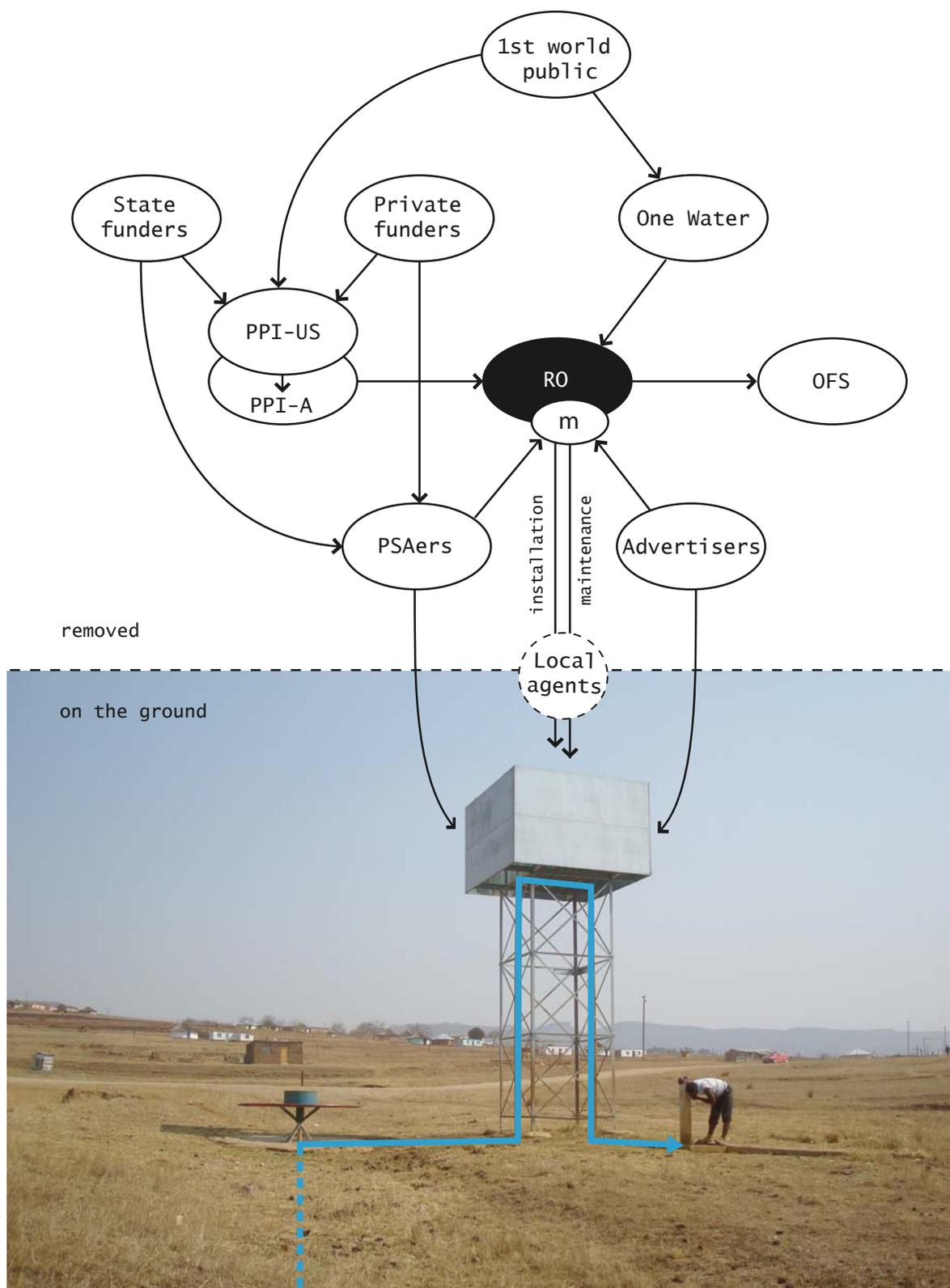


Fig 8.1: The *PlayPump* system, top-half circa 2006 (arrows indicate movement of money), lower-half 2010, KwaZulu Natal, South Africa (photograph by the author).

Chapter 8

Reanalysing the *PlayPump* 2: critical lenses

“I used to sell dreams, hopes, and goals for the future”.

Trevor Field, “The Making of a “Philanthropreneur””, *Journal of Values Based Leadership*, Summer 2008

8.1 Introduction

This chapter is the second half of the reanalysis of the *PlayPump*. Where the first part of this reanalysis looked mainly at the performance of the *PlayPump* in the field, interrogating its claims to be an appropriate technology, this second part uses the perspectives generated in previous chapters through the examination of interventionist artwork and critical design projects, and of the struggle of the APF against the prepaid water meter in South Africa, as ‘critical lenses’ through which to examine the *PlayPump*.

The interpretations of the *PlayPump* generated through the application of each of these three critical lenses are listed together at the end of this chapter, following a similar format to the end of Chapter 7. The perspectives gathered in Chapter 7 and Chapter 8, together with the first account of the *PlayPump* in Chapter 2, are used in the conclusion to the thesis, in Chapter 9, to construct an overall picture of the *PlayPump* which connects these observations. The implications of this are used to reflect on the broader field of design for development.

8.2 Critical lenses

In Chapters 4 through 6, perspectives on objects (and actors) that equip users while communicating to audiences were gathered from examples of interventionist art, critical design and activist practice. These form a set of ‘critical lenses’ through which we can examine the *PlayPump*. These critical lenses draw mainly from the descriptions and analyses of selected examples in the second half of each of these chapters; the first halves of each chapter, which contextualise the examples chosen, are drawn on more in reflecting on design for development in Chapter 9.

In Chapter 4: Art intervenes, Cildo Meirele's work 'Insertions into Ideological Circuits', and Krzysztof Wodiczko's conception of 'Critical vehicles', were used to examine Michael Rakowitz's *paraSITE* and Judi Werthein's *Brinco*. The perspectives arrived at there are applied to the *PlayPump*, to observe in what ways, and for what purposes it enters into or redirects circuits in society, and how it equips users while communicating to audiences.

In Chapter 5: Critical design, Anthony Dunne and Fiona Raby's works *Placebo project* and *Energy Futures* were examined, using concepts from their writing around a 'critical design' practice. These concepts are applied to the *PlayPump* to ask in what ways it could be characterised as a 'para-functional object', and what kinds of narratives it presents: what kind of 'material tale' it is.

In Chapter 6: Antiprograms, the struggle of the APF against the imposition of prepaid water meters in poor areas of Johannesburg was interpreted through Bruno Latour's idea of 'programs' and 'antiprograms', and their actions were portrayed as combining 'protest and participation', drawing on Isaac Davids' identification of 'provided' and 'popular' spaces of participation. The *PlayPump*'s relationship to both the APF and the prepaid meter is examined through these perspectives.

While continuing the work of Chapter 7 in examining the *PlayPump*'s performance, this chapter pays particular attention to the way the *PlayPump* can be 'read'. This type of characterisation of the *PlayPump* began in Chapter 2: Design for development, where several representations of the *PlayPump* – the *PlayPump* as symbol or image – were noted. These readings were described under four headings; the *PlayPump* as: i) a creator of 'positive narratives'; ii) an innovative object; iii) as evoking the metaphor of 'child's play'; and iv) as 'the magic roundabout', accomplishing work without discernible labour. These representations will be revisited in this chapter.

The application of the lenses in this chapter results in writing which is more 'essayistic' than the more contained analysis of the *PlayPump*'s performance in Chapter 7, which uses as its 'lens' an example which is close to the *PlayPump*: another water pump operating in the same region, analysed as an appropriate technology, which the *PlayPump* claims to be. By essayistic I mean both the style of the writing, which uses at points a more active, personal voice than the largely passive voice used so far; and I refer to the origin of the word essay as 'to try', to attempt – the work here is more speculative, questioning, attempting to read the *PlayPump* in imaginative ways (though always connected to evidence).

The diagram of the *PlayPump* system at the start of this chapter, fig 8.1, is for reference throughout the analysis. It combines the diagrams of the ‘removed’ networks of the *PlayPump* and the *PlayPump* ‘on the ground’ from the previous chapter, producing a diagram to which we can refer in investigating the ‘circuits’ in which the *PlayPump* partakes, and the *PlayPump* as physical object in the field. The state of the *PlayPump*’s removed networks shown here is circa 2006, at the height of its visibility and influence. The arrows between bodies indicate how funds are passed around the system. In continuing to pay attention to the relationship of the *PlayPump* to distant bodies connected to it, we are building on the suggestion that analysing objects as having ‘fluid boundaries’, that include other bodies, adds to our understanding of them. *One Water*, donor to and campaigner for the *PlayPump*, and *loveLife*, as an example of an NGO renting the *PlayPump*’s billboards for ‘public service’ messages, come under particular scrutiny as part of this analysis.

8.3 Art intervenes

Chapter 4: Art intervenes noted the interest of some contemporary artists in design for development and appropriate technology, as part of a wider 20th century movement into the appropriation and production of functional objects by artists. These objects produced by artists do not abandon representation and communication, but continue to seek audiences as they equip users. Two art projects were examined in detail: Michael Rakowitz’s *paraSITE*, a series of inflatable homeless shelters, and Judi Werthein’s *Brinco*, a limited run of factory-made custom sneakers for Mexican border-jumpers. Their work with systems or ‘circuits’ was framed as part of a wider focus in interventionist art, using Cildo Meirele’s work ‘Insertions into Ideological Circuits’ (1970), which describes techniques for getting messages into public circulation; and through Krzysztof Wodiczko’s proposal for ‘critical vehicles’, functional objects for equipping the marginalised while communicating the circumstances of their vulnerability to the wider public.

In this section, the perspectives established in Chapter 4 are applied to the *PlayPump*, particularly to the way in which the *PlayPump* has been represented to audiences, as described in Chapter 2, and in light of what we now know about its performance in the field. These perspectives lend themselves too to investigating how the *PlayPump* object relates to users, and how the *PlayPump*’s relationship to other bodies (the ‘circuits’ in which it takes part) might inform our analysis of it.

8.3.1 ‘Insertions into circuits’

Cildo Meireles’ series of works ‘Insertions into Ideological Circuits’, which saw him place messages into public circulation by inscribing them on everyday objects such as Coke bottles and money, informed our analysis of Rakowitz’s and Werthein’s work with systems and flows. ‘Insertions into Ideological Circuits’ began with a text Meireles wrote in 1970 in which he identified ‘circuits’, or ‘mechanisms of circulation’ in society into which, if one wanted to reach the public, one could insert one’s own messages, which might conflict with the ideology of the circuit, but could travel in them if they escaped detection. Such circuits could be used in this way by people who do not have central control of them, “to achieve an increase in equality of access to mass communication” (Herkenhoff et al. 1999).

In Chapter 4 we established a series of perspectives on *paraSITE* and *Brinco* using Meireles’ ideas as a starting point. We observed: i) techniques for making insertions into circuits, such as camouflaging messages and imitating common objects to enable their circulation in society, noting Werthein’s use of ubiquitous commodities or ‘vernacular objects’ in her work, as sites on which messages can be written and circulated; ii) the type of messages to be circulated, as proposed by Meireles, which may conflict with the characteristics of the circuit, or which, as in Werthein’s work, may reveal aspects of it; iii) the way circuits can be identified, connected and redirected in order to redistribute their benefits, as in Rakowitz’s work; and iv) circuits’ strange play with value, particularly the acquisitive nature of some circuits, which leech from or distort the value of goods moving through them. We will move through each of these perspectives in turn, applying them to the *PlayPump*.

8.3.1.1 Making insertions

Meireles chose particular mass-produced objects in circulation in society on which to write messages intended to reach the public: bottles of Coke, for example, a ubiquitous commodity whose contents were consumed across a range of society. Bank notes pass from hand-to-hand across all sectors of society, and he wrote messages on these too. In analysing Werthein’s work *Brinco*, we saw that she chose as a medium for her messages a ubiquitous commodity consumed across different sectors of society: the sneaker. We identified this as a technique she has used in other projects: identifying ‘vernacular forms’ through which to communicate beyond the art world to a broader public. Bought commodities are one such vernacular form; and we can see them used to address the public in design for development too, through the BOGO campaign model.

An avenue by which the *PlayPump* reaches the public is through messages written on a ubiquitous commodity in circulation in the first world: bottled water. *One Water* bottles carry photographs and text depicting the *PlayPump*. *One Water's* messages about the *PlayPump* are not literally written onto objects belonging to someone else's circuit, as in Meireles' original work. Instead, like *Brinco*, *One* introduces its own circulation of objects into a wider market of similar objects. *Brinco* was designed as an imitation of a designer sneaker, the product of an imaginary corporation; she gave them away and sold them through sneaker stores; and when Wertheim exhibited the project, she placed the shoes amongst 'real' shoe brands in a mock-up of a shoe store. *One* too represents itself as infiltrating supermarket shelves with their product; they emphasize their product as a substitution rather than an addition to the market, with their intention not to sell water as such, but to raise money for projects in the developing world: "IF you are going to buy bottled water, then buy *One Water*" (*One* 2010a). As Meireles intended with his work, *Brinco* sneakers and *One Water* are meant to infiltrate a larger circuit by masquerading as an object already circulating within it – but in Wertheim's and *One's* case, rather than writing on someone else's product, they produce their own version of the product, but one with a different 'message'.



Fig 8.2: *One Water* bottle label, featuring an image of the *PlayPump* and text describing it.

As well as using *One Water* to distribute messages to the public, as an insertion into the bottled-water market, we could perhaps identify the *PlayPump* itself as an insertion into another circuit: the development arena. The *PlayPump* is promoted as an appropriate technology, but from the evidence established earlier in this chapter about the numerous faults in the system, and by applying de Laet and Mol's definition of appropriateness as fluidity to it, this thesis argues that it is not an appropriate technology. We could see the *PlayPump* then as masquerading as an appropriate technology, promoting itself as one in order to receive funding and support directed towards appropriate technologies. This impression is reinforced by how Field tells the story of their rise to prominence in the development arena.

Before the *PlayPump* became well known, “we were running a fully commercial operation called Roundabout Outdoor, which we still run today. We were selling the advertising on all four sides of those water towers for commercial gain”, said Field (Greene & Stellman 2009, p.176). That changed in 1999, as described in Chapter 2, when the attendance of Nelson Mandela at the opening ceremony of a school with a *PlayPump* system attracted players from the development sector: “a whole lot of different people were there, from the World Bank, from UNICEF and CARE and Planet International, all sorts of different people” (ibid). A World Bank representative, Dr Paul Ross, suggested Field enter the *PlayPump* in the World Bank Marketplace Competition, and helped him with the application. After winning that competition, “people started giving us money out of the blue”, leading to Field establishing a non-profit, and “instead of us amortizing¹¹ the advertising against the cost of the equipment” – the system had been completely funded by advertising – it could now be funded by donations *and* advertising (ibid). The *PlayPump* moved in this way into the donor-funded development arena through accepting the opportunities that came its way, rather than through design.

8.3.1.2 Types of messages

Meireles characterised the types of messages he was concerned to propagate through circuits as those which conflicted with the ideology of the circuit itself: contrasting “awareness (a result of the insertion) with anaesthesia (the property of the existing circuit)” (Herkenhoff et al. 1999). *Brinco* does this work: the label on the shoe revealed the circumstances in which the sneaker was made, so showing the potential for labour exploitation in the production of other commodities of the same type. *Brinco* was intended to direct attention to the inequity that arises within global flows of labour and capital, and to disrupt the ‘anaesthesia’ in the unthinking consumption of the commodities they produce. Like Meireles’ project *Eppur si Muove* (1990) it was intended as ‘a type of inquest’ into the nature of the circuits it was within, casting a critical light on their workings.

The *PlayPump* is claimed as awareness-raising too. Gary Edson, when CEO of PlayPumps International, described how “the powerful appeal of the “play and pump” idea, together with compelling images of children at play on our equipment, has contributed greatly to increased awareness of the water crisis” (Edson 2009). The Case Foundation sought a sustainable water solution for Africa that would “inspire other donors to get engaged” (Case Foundation n.d.).

¹¹ Paying off the cost of the equipment over time (using the advertising income from the billboards).

But while claimed as ‘awareness raising’ about the ‘water crisis’ in Africa, the *PlayPump* does not shed any particularly critical light on the issue, rather it suggests simply that it can solve the problem, given enough funding. It doesn’t reveal anything about the ‘circuit’ of which it is a part, the wider field of water in development, with a variety of technologies and approaches; and it certainly doesn’t reveal any of its own failings.

The message on *One Water* bottles is similarly uncritical. It reproduces the *PlayPump*’s claims, and focuses the consumer’s attention broadly on the need for water in Africa, but also on itself, and on the *PlayPump*, as a means of addressing this problem. *One Water* reveals nothing, either, about the problems in the circuit of which it is an immediate part: bottled water. Some visitors to the Facebook page for *One Water*’s campaign to register 250,000 supporters for the installation of a *PlayPump* in Malawi, commented on this. “Drinking bottled water is a very poor way of helping those without water. The carbon footprint of bottled water is very high and the resultant climate change will do more harm than good to those you are purporting to support. You will do more to help those without clean water supplies by not buying bottled water but drinking it out of the tap!” comments one person. “It is far more responsible to encourage people to either buy reusable water bottles or wait until they can get to a municipal source of water than it is to encourage them to buy bottled water. It’s too bad that the welfare of others is so closely tied through this campaign to people having to buy a product that produces so much waste each year, and is utterly unnecessary” writes another (One 2010a).

One replied that they are aware of this criticism of bottled water, and know that many people share those views; as explored in more detail in the next section of this analysis, their excuse is that their reason for selling bottled water is merely to divert the funds from this market towards charitable causes. They resist the more fundamental criticism that bottled water is itself harmful, regardless of where the profits go. The appearance in the last decade of ‘ethical’ bottled water brands like One are a tacit acknowledgement of the sustained criticism the market has come under, as a ‘manufactured demand’ with negative environmental and social effects¹², unnecessary in first-world countries which are already well-provided with municipal

¹² Particularly in the developing world: on the island of Fiji, for example, where one of the world’s top bottled water brands, *Fiji Water*, is produced, “a state-of-the-art factory spins out more than a million bottles a day of the hippest bottled water on the U.S. market today, while more than half the people in Fiji do not have safe, reliable drinking water. Which means it is easier for the typical American in Beverly Hills or Baltimore to get a drink of safe, pure, refreshing Fiji water than it is for most people in Fiji” (Fishman 2007). The bottled water industry has been identified as a part of the global corporatization of water, with multinational corporations

supplies of clean water. Starbucks Corp and Pepsi-Co have distributed the *Ethos* brand of bottled water, with the tagline ‘Helping children get clean water’, since 2005, the same year *One* was launched; 5c on each bottle of *Ethos* is donated to water projects in the developing world. Volvic, a long-established bottled-water producer, has been running the ‘Drink 1, Give 10’ campaign, also since 2005, in which 4c on every litre it sells goes to UNICEF to fund the provision of 10 litres of water in the developing world.

Bottled water brands like *Ethos* or *One Water* which associate themselves with water projects in the developing world could be seen as simultaneously trying to negate criticism of bottled water as a product, and to distinguish *their* product from others by making it more attractive to consumers who can ‘do good’ while consuming. Rather than Meireles’ notion that one can introduce messages into a circuit which rupture the ‘anaesthesia’ of the circuit, *One Water* contributes with its message to the consumer’s complacency: it aims to make people feel better about buying bottled water. “You can also rest assured” reads the label of the ‘Relax’ brand of *One Water* (which contains “a blend of yummy blueberry and pomegranate juices, plus a powerful combo of vitamins... to help you chill out”), “that you are helping communities in Africa reduce the stress in their lives, with better access to clean water and nutrition” (see fig 8.2 on p.210). As Field said, it’s “a really clever way to get a lot of people to donate money to a charity without really thinking about it... All you do is buy a bottle of water and you know you’re doing the right thing” (Fry 2007).

8.3.1.3 Redirecting benefits

In Chapter 4 we extended Meireles’ ideas for how to make use of circuits, to Rakowitz’s work in piercing the connections between circuits and redirecting their ‘goods’ to benefit the marginalised. On a pragmatic level *paraSITE*, for example, makes use of the otherwise wasted hot air from buildings’ heating and ventilation systems to support it; and in *Rise*, where Rakowitz connected the vent from a Chinese bakery to a new gallery space in the same building, he was interested not just in revealing aspects of the system the artwork was operating in – artists and galleries as vanguards in the gentrification of poorer industrial districts – but in directing more customers to the Fei Dar bakery. The artist collective Superflex conceive of their role as to redirect grants and monetary awards circulating in the

“stepping in to purchase groundwater and distribution rights wherever they can... the bottled water industry is an important component in their drive to commoditize what many feel is a basic human right” (Baskind 2008).

artworld towards marginalised groups outside the system of art, such as farmers in the developing world.

One Water too describes their mission in accessing the bottled water market as to “displace those profits into causes that address the imbalance in our world” (One 2010a). As “a not-for-profit business, operating in the corporate world”, they present themselves as infiltrating the bottled water market, “worth over a billion pounds in the UK”, in order to redirect its benefits to the “5000 children [who] die a DAY from water borne disease” (ibid). Their association with the *PlayPump* has certainly helped them to enter this market: a professor from Cardiff University observed that One CEO Duncan Goose had “successfully broke into a market dominated by big players”, and that one might call him the “Richard Branson of social entrepreneurship” (Fry 2007). Field presents the *PlayPump* as a means of similarly diverting benefits to those who need them. As he said in an interview at the University of Michigan in 2007, he doesn’t want to sound like “Robin Hood”, but with their system for using advertising rental to pay for the maintenance of the *PlayPump* “that’s what we try and do, we try to take from the rich and give to the poor” (London 2007). He described the system in the same way to Architecture for Humanity, as “a bit of a Robin Hood exercise” (2006). Field presents the rental of the billboards then as diverting funds from advertising to pay for social projects, for ‘public benefits’¹³.

But is offering opportunities for companies to advertise to potential consumers of their product or message really ‘taking from the rich to give to the poor’, or is something of value being offered to advertisers, or taken from audiences? How far have users of the pump benefited from advertising on its billboards? These are tricky questions, and they involve working between the *PlayPump*’s advertising-funded maintenance system as it has been presented through its public campaigns and to donors; and how it is has actually performed, judging both from observations in the field, and from what Roundabout Outdoor says about it in more restricted forums.

On the one hand, the system for funding the maintenance of the *PlayPump* through advertising has been touted as the means of the pump’s ‘sustainability’ in the field; which, with maintenance being probably the most vexed issue in appropriate technology, is a major selling

¹³ Roundabout Outdoor’s first non-profit offshoot – Roundabout PlayPumps – was incorporated as a ‘Public Benefit Organisation’ (PBO), a new category of non-profit introduced by the South African government in 2003 for companies which do work normally undertaken by the state (Gingerich 2008).

point. As Clarissa Brocklehurst explained UNICEF's initial interest in the *PlayPump*: “if anything is going to catch my attention, it's something that's going to come with a new paradigm for O and M [Operation and Maintenance]” (Costello 2010a). Field, when asked what made the *PlayPump* different to more traditional solutions for supplying water, replied “one word: sustainability” (London 2007). The advertising-funded maintenance program, Field said, “guarantees the sustainability of the system” (ibid). Government would be attracted to renting the billboards for their messages, as “an infrastructure for a governmental communication tool”, and commercial advertisers would be attracted by access to “a precise target market. The women, who collect the water, are the ones making the purchasing decisions” (Bloom 2004). He claimed that the number of people exposed to the *PlayPump*'s billboards, both commercial and public service, would be around 5,000 people per installation, as noted in Chapter 2.

This, then, is a part of the *PlayPump* system which is taken very seriously, and regarded as a major advantage of the technology. Making this part of the *PlayPump* system has been of benefit to the project's advancement, certainly. If the scheme had worked then it might have been of benefit to users too (disregarding for the moment the other problems the *PlayPump* has experienced with maintenance, besides its source of funding). But the system didn't work to generate funds because advertisers failed to take up advertising on most *PlayPumps*. No benefit was gained by users, and because the water tower was designed at the right height for advertising billboards, rather than the minimum for maintaining water pressure, pumping water was in fact made harder for users by the advertising component of the system.

The *PlayPump*'s major backers have demonstrated that they are uncomfortable with the fact that it incorporates commercial advertising. The Case Foundation described the *PlayPump* on their website as a child's merry-go-round that “provides safe water and educational messages to... African schools and communities”, making no mention of its commercial advertising (Case Foundation n.d.). A document by USAID, the next largest funder of the *PlayPump*, says only that “the water tower near each PlayPump system has billboards that highlight education and health messages... The billboards provide an alternative way to inform rural families with urgent health messages” (USAID c. 2006). Neither USAID nor the Case Foundation mentions that only half of the billboards are for ‘education and health messages’, with the other half for commercial advertising. Their omission of this fact indicates that they are aware that the inclusion of commercial advertising in the *PlayPump* system might jar with its role as an object to supply a basic need to poor communities; that including commercial advertising on a technology intended for poor people might be perceived of as exploitative.

Roundabout Outdoor confirmed that they have had problems convincing advertisers of the merits of advertising to poor rural locations, because businesses don't see value in that market (Melman & Morris 2010). This is to be expected – companies pay for advertising in order to gain benefit for themselves. In not paying for advertising space on the *PlayPump*, they undermine Field's claim that the advertising-funded model of the system is 'taking from the rich to give to the poor': when 'the rich' – companies with products to sell – don't get something back in return, they are reluctant to give. But Field is keen to persuade companies that even if they don't sell more of their product to the people in the area of the pump, they still stand to benefit: "we can make a really big organisation look fantastically well by being associated with PlayPumps. They might not sell any more tubes of toothpaste in the area where they're advertising... they will sell a few, naturally... but if they turn around to the European or the American markets and say hey look, when you use our product not only does it give you white teeth but you're helping these people [in Africa], that's cause marketed, and that is so powerful" (London 2007). As Field said in the same interview: "Everybody wants to have something in return" (ibid).

The benefits of the *PlayPump*'s advertising system, we can observe, are restricted to the removed parts of the system: advertisers have the potential to extract value from consumers around the *PlayPump* – though there are few sites where they believe the returns justify the investment; companies and organisations involved with the project get to look 'fantastically well' through being associated with it; Roundabout Outdoor gets support for the project by offering a uniquely 'sustainable' maintenance model, and has a potential revenue stream from billboard rentals. But the pump's maintenance is undermined by the lack of uptake of advertising rental, and the people on the ground, using the system, have to work harder to pump water to the height of the (empty) billboards.

8.3.1.4 Strange play with value

Meireles work *Eppur si Muove* (1991) identified the acquisitive nature of some circuits, which leech value from goods moving through them. "Instead of accumulation, the participant's capital undergoes dissipation" (Herkenhoff et al. 1999, p.50), revealing "the devouring tendency of capital" (ibid, p.152). Werthein with *Brinco* exploited one circuit to produce cheap goods, and another to sell them at high prices, satirising other products that perform the same trick. She highlighted the immaterial value of 'the brand', and the shifts in value made possible by her privileged access, by giving her sneakers away in Mexico, and selling them at high prices just a few miles away across the border.

The *PlayPump* also performs some strange play with value. Following the idea of the *PlayPump* as an insertion into development-funding circuits, we can picture it drawing funding to itself at four times the rate of other handpumps. But the effect of this on the ground is not to provide four times the value to the user, but actually to diminish value: most communities preferred the less expensive and more productive handpumps they had before. So four times the money spent provides less than the value of an ordinary handpump to the user; there must be more than a four-fold loss of value in funding *PlayPumps* over ordinary handpumps. Owen in Malawi argues out this issue, starting with the observation that “for the same amount of money, you can get four times *fewer* pumps into the ground using *Playpumps* than using conventional pumps. All else being equal, this means you can achieve a four times smaller reduction in waterborne disease burden, or, if you want to be dramatic about it, extend the lives of four times fewer children” (Owen 2010b).

But he goes further: because *PlayPumps* are less efficient at pumping water than conventional pumps, we need to subtract that value too. He assumes, conservatively, that they are half as productive as a conventional pump, so “taking water output as a proxy for impact, you’d need to be able to fundraise 8x more money using *Playpumps* than conventional pumps before you break even on impact” (ibid). As water output is not a perfect proxy for impact, and distribution matters too – “installing more pumps for the same amount of money has a impact-multiplication effect over and above the increase in water output” – the true cost of a *PlayPump* is more than 10 times a conventional handpump (ibid). The *PlayPump* has the strange capacity to reduce the value of money spent in the development circuit, in comparison to alternatives, by more than ten-fold by the time it reaches the user. Through our work in Chapter 7, we know the *PlayPump* to be much less than half as productive as other handpumps, but a greater than ten-fold reduction will suffice for our argument.

What happens to this dissipated capital? The *PlayPump* system does have more material components to it, raising its cost – this was the reason why Stuver thought it would be difficult to realise, and why Field’s main contribution to the design was to devise income for it. From the start, the *PlayPump* was designed to make money. The fact that Field’s first scheme for it was funded solely through advertising indicates how much excess there might be when donors pay for all initial costs. Our analysis of the system’s ‘maker’ in Chapter 7 identifies other places where funding might go, for “the right to use it... for a name, for legal and maintenance fees, for the overhead of patent institutions, or for the inventor’s retirement pension” (de Laet & Mol 2000, p.249). The expansion of the *PlayPump*’s extended network over time must mean more money is extracted by it. We can observe that other bodies in the

PlayPump's network have the property of absorbing large amounts of funding too: particularly *loveLife*, the organisation Roundabout Outdoor partnered with to win the WorldBank Marketplace Award.

loveLife, like the *PlayPump*, has been criticised for the way it absorbs large amounts of funding for little tangible impact on the ground. In 2002 *loveLife* was receiving R50 million (approx. €5 million) a year from a range of large South African companies (Isaacson 2002), in addition to R75 million rand (earmarked over three years) from the South African government, and international governmental and NGO funding (Noseweek 2003). Its largest funder was Global Fund, who had committed US\$80 million to the organisation. But in 2005 Global Fund stopped this funding halfway through, because “*loveLife* is extremely costly”, as a spokesman told a UN news agency in 2005 (PlusNews 2005). “There are programmes that have been very effective, which cost a fraction of what *loveLife* costs. It would be irresponsible of the Global Fund to spend almost \$40 million [more] without seeing results” (ibid). Like the *PlayPump*, *loveLife* had made high claims for its impact, launching in 1999 with a five-year campaign which had “the stated purpose of halving HIV infection among South African youth”; but by 2003 no fall in infection rates had been detected (Noseweek 2003). Nevertheless, *loveLife* continues to receive large amounts of international and local funding in South Africa.

As to where the money goes in *loveLife*: its board in 2003 included many heads of media outlets, such as the director of public broadcasting at the South African Broadcasting Corporation (SABC); the CEO of independent television channel e.TV; and the editor of The Star newspaper (Noseweek 2003). Such media partners “take a good cut of *loveLife*'s R60m annual communication budget”, as they were paid from *loveLife*'s funds to produce supplements in newspapers, and host advertisements on television (ibid). 20% of *loveLife*'s promised US\$80m budget from the aid agency Global Fund was committed to paying Independent Newspapers and the Sunday Times to publish two printed supplements for teenagers in two of South Africa's main newspapers. These publications included advertising of products alongside anti-HIV/AIDS messages. The goods advertised were quite likely unaffordable to the poor majority to whom *loveLife*'s campaign was meant to be directed, but because they were inserted into every newspaper distributed, would have served to advertise to middle-class readers as well (ibid). *loveLife*'s communication budget paid too for the rental of 2000 billboards countrywide, including the *PlayPump*'s, “singlehandedly keeping the outdoor media industry alive” (Noseweek 2003).

loveLife, like the *PlayPump*, is a platform for commercial messages as well as public-service messages (of questionable impact), and they are both examples of companies that perform

development or social work on the one hand, attracting large amounts of funding, but which are involved in mutually beneficial activities with a range of partner organizations at the same time. Their way of working diminishes the value moving between donor and recipient, by dissipating capital throughout the circuits they are a part of.

8.3.2 ‘Critical vehicles’

In Chapter 4, we interpreted *paraSITE* and *Brinco* through Krzysztof Wodiczko’s concept of ‘critical vehicles’: functional objects that equip the vulnerable while acting as carriers or mediums for critical messages. He described the critical vehicle as “an “ambitious” and “responsible” medium—a person or piece of equipment—that attempts to convey ideas and emotions in the hope of transporting to each human terrain a vital judgment toward a vital change” (Wodiczko 1999, p.xii). In applying what we observed about critical vehicles in that chapter, to the *PlayPump*, we can use the three perspectives established there to examine: i) how the *PlayPump* conveys issues to audiences; ii) how impact on social problems is claimed for equipment like the *PlayPump*, relative to *paraSITE* and *Brinco*; and iii) the relationship of the *PlayPump* to its users – what does it allow them, or compel them, to express?

8.3.2.1 Conveying issues

Wodiczko described critical vehicles as “a medium; a person or a thing acting as a carrier for displaying or transporting vital ingredients and agents” (1999, p.xii). *paraSITE* and *Brinco* share Wodiczko’s objective of using functional objects as mediums, displacing attention from their instrumental use to their capacity to communicate issues. Both projects place objects in public space, reaching some audiences this way, but also aim to get them into the mass media, reaching much wider audiences.

Field too sees the *PlayPump* as a “medium” (Field 2009). PlayPumps International describes it as an “inspirational machine” (PlayPumps International 2009a). While the *PlayPump* as a message-carrier travels much further through representations of itself, as image, the object itself travels too for this purpose – it has been installed in Terminal 5 at Heathrow airport, and in amusement parks in Britain. It functions there not as a tool for the user to pump water, but as a tool for advocacy to first world audiences. It is used as a vehicle for ‘issues’, raising awareness about ‘the water crisis’, as Edson described it; though we identified under ‘Insertions into Circuits’ the limits to the awareness the *PlayPump* raises. Like *paraSITE*, which was characterised as having the potential to overcome ‘empathy fatigue’ around the issue of homelessness, the *PlayPump* as an object which addresses the problem, rather than a text

which just refers to it, shares this potential. In an age where “preaching is suspect” (Thompson & Sholette 2004, p.14), the *PlayPump* instead shows that the problem is being solved, and that you can be involved in the solution: climb aboard.

paraSITE, we noted in Chapter 4, has the odd characteristic of communicating aspects of the problem it is designed to address, through its form. Its use of ephemeral materials (air, and transparent plastic) and the way it is used, connected onto buildings through its umbilical cord, imply the vulnerability and dependence of the homeless. In this Rakowitz is following the approach Wodiczko set out in advocating an ‘interrogative design’ practice, in which he imagines apparatus “that will communicate, interrogate, and articulate the circumstances and the experiences of the injury” (1999, p.9).

Does the *PlayPump* do any of this type of work? Not so much in its form; but in the way it is presented to audiences it could be described as ‘incorporating the problem’ – the messages that accompany it make reference to the general problem of water need in the developing world. As we noted in Chapter 2, the *PlayPump*, along with other design for development objects, conflates the scale of the problem with its own scale of impact, inviting audiences to associate the urgency of the problem with the capabilities of a particular technological fix for it. In this sense, many design for development objects communicate the problem along with the ‘solution’, in a broad sense. But this is a general approach, not specific to the form of the *PlayPump* object; if we were to read the *PlayPump* as if it were an artwork, a critical vehicle, what would it communicate? We will do some of this imaginative, interpretative work through the lens of ‘critical design’, the next set of perspectives used in this chapter – but we can do some interpretation here.

Rather than communicating the problem, as *paraSITE* does, the *PlayPump* communicates more about the solution, and the reception the project is supposed to receive from communities. The *PlayPump*’s incorporation of a brightly-coloured piece of playground equipment, the roundabout, and the mode of use it implies – children’s play – is meant to communicate fun, enjoyment, entertainment, celebration, and the lack of effort needed to produce water. The Centre for Design Innovation interprets the *PlayPump* in this way: the pump is “seen as something to be celebrated” by communities that receive it, and so “designing a pump which incorporates the play of children, takes this emotional element into account. Its design combines the function of the pump with the celebration of its installment and use” (Centre for Design Innovation 2009). This ‘celebration’ of the *PlayPump* is not just a celebration of its supposed benefits, but a celebration of gratitude for the ‘gift’ the community has been given. The scheme that Crealy Adventure Park in Britain had for their *PlayPump* installations makes

this reading clear: they planned to install a cash machine next to each roundabout “where children can make donations. As people insert money or swipe a credit card, a screen above will show children in Africa riding on the roundabout and shouting, “Thank you!” The money raised will go to install more roundabout pumps in Africa” (Lamb 2005).

This way of attracting attention to a social problem, through emphasizing the gratitude of the recipients, saw some expression in the press reaction to the distribution of *Brinco* shoes, noted in Chapter 4, for example. The manufacturers of the South African *Hippo Water Roller* refer too to the way the press is attracted by such stories, increasing their uptake into the mass media: they advertise the “Public Relations” benefits to sponsors of associating themselves with their product, which “touches the heart of many in the media and has a strong emotional appeal because it addresses such a basic human need” (The Hippo Water Roller Project n.d.). This approach is in contrast to Wodiczko’s aim to jar audiences into the realisation of their own complicity in social problems, or of generating friction, putting a little sand into the machine of democracy. He suggests his vehicles could be understood as “a negative metaphor” (1999, p.xvii). Both *Brinco* and *paraSITE* attracted attention from the media and the public through creating controversy, and condoning illegal actions. There is little in the *PlayPump* to implicate the viewer, beyond asking them to help fund it. The *PlayPump* demonstrates instead only the first technique for getting a project into the media – not controversy, but entertainment, and positive narratives, stories to make audiences feel good.

8.3.2.2 Acknowledging limits

A feature of how both Rakowitz and Werthein frame their work in equipping users is the way they downplay the direct impact of their work on the social problems they address. They direct attention instead to their work as a means to generate discussion, and to pressure policy makers to act on the issue, both directly and through the public. Wodiczko promoted this idea of the object as a bandage, serving to attract attention to an issue.

The *PlayPump* in contrast, as we know from Chapter 2, rather than acknowledging limits to its impact, emphasizes itself as a solution with wide-ranging capabilities. “Children’s roundabout solves the water problem in remote areas”, read the Roundabout Outdoor website (Roundabout Outdoor n.d.). Where the *PlayPump* puts pressure on policy makers, it is to pressure them into specifying the *PlayPump* as the preferred source of water provision, or to sign Memorandum of Understanding to exempt them from import duties. It also pressed UNICEF and the Mozambiquan government to suppress the critical reports they had produced.

It also stimulates some publics to make negative demands of policy makers: it drove communities in Mozambique to complain to their district administrators about the failures of the technology; some of these communities had their *PlayPumps* replaced as a result. In the *PlayPump's* communication to the first world public, either through its limited appearances as an object, or mainly through its image, it does not impart a particular message for the public to present to policy makers. In looking for support from the public directly, as in the *PlayPumps* International fund-raising campaigns, the *PlayPump* could actually be interpreted as *bypassing* policy makers, suggesting that individual members of the public can 'make a difference' themselves: though this also has the potential to add first world public support for the installation of more *PlayPumps* to the other pressures the *PlayPump's* producers exert on policy makers. The fact that the *PlayPump* is attractive to the first world public may make associating with the project attractive to politicians and development organisations.

One Water does ask the public to pressure 'institutions'. It has been building a public support base on Facebook, where it started a campaign to get 250,000 people to 'like' *One Water*. "One of our trustees is going to fund a Facebook *PlayPump*, worth \$10,000 and give clean fresh water to an average community of 2,000 in Africa!" read their announcement. "To do this we need 250,000 fans" (One 2010b). This confused some early visitors to the site, who posted comments asking why One needed a certain number of 'fans' if the pump had already been paid for. One's response framed the campaign as a way of putting public pressure on retail outlets: "we stock our products, including One Water, in a number of UK retail and food outlets, but we'd like to get on the shelves in the leading supermarkets in the UK. Believe it or not, they need to be convinced that there will be demand for our products. Simply by having a big supporter base you'll be helping us to get these listings. Again no cost to you" (One 2010a).

One hopes that having evidence of 250,000 supporters, who are also potential consumers of their product, will allow them to expand their operations, getting their product into more stores. By June 2010, the campaign had 232,000 fans. The true size of the network they will gain through their Facebook campaign is no doubt much higher, as each of these supporters have their own personal networks, which, depending on their privacy settings, would also become known to One as individuals potentially interested in supporting their product. An outlay of US\$10,000 for the single *PlayPump* installation at the centre of the campaign seems a low price to pay for access to hundreds of thousands of supporters. From our work under 'Redirection of benefits', this seems like another example of benefits accruing to the already powerful, within systems whose supposed intent is to help the less powerful.

Early on in their campaign, a supporter suggested that One put this information about putting pressure on retailers to stock their product, posted only in response to a query, on the front page of the campaign to help explain how it worked, as so many people were asking that same question. But One did not do so: it appears that they did not want to foreground the commercial benefit to themselves that motivated their campaign strategy. While One aims to motivate a public to put pressure on other institutions, it does so to expand its market share – though of course, they represent this as being the same thing as raising awareness about a social issue, and helping people in the developing world.

8.3.2.3 A vehicle for the user

The vehicles proposed by Wodiczko are both equipment for the user, which is sometimes literally a transportation device, and also more metaphorically a ‘vehicle’ for their voice, a mouthpiece for their communication to the public. *Brinco* shoes assisted users in their border-crossing, and were designed with elements meant to communicate their cultural identity and pride. *paraSITE* shelters both equipped users to stay on the streets, and were taken up by their occupants as a means of expressing resistance to the city’s plans to relocate them – as a vehicle for their defiance.

What kind of vehicle does the *PlayPump* provide the user? It is designed to perform a ‘critical function’ for the user, to supply them with water, as *paraSITE* and *Brinco* are intended to provide shelter and transport. But where *paraSITE* and *Brinco* aim to facilitate the user’s own intended action, as a continuation of their existing practice – to stay homeless in public space rather than a shelter, or to cross the border looking for work rather than work in a *maquiladora*, the *PlayPump* imposes a mode of action foreign to the user. “One should not forget that for the last 20 to 25 years, most adults were used to operate a handpump by moving up and down a pump handle” noted Erpf about the *PlayPump*. “This is in most cases the reason why the communities are not very happy” (Obiols & Erpf 2008, p.36).

Adult users do not turn the roundabout by sitting it on it and turning it with their feet, a “strange operation technique that has so far not been accepted by African women” (Obiols & Erpf 2008, p.24). Because they turn it by hand, it is difficult to use, and some adults feel embarrassed to be seen using it. In this circumstance, the *PlayPump*’s roundabout as a mode of ‘celebration’ becomes a mockery of the hard work and the indignity it imposes on them. Rather than acting as a means for the user to express their defiance or recover their sense of dignity, as *paraSITE* and *Brinco* do, the *PlayPump* locks the user into a performance of celebration and gratitude where there is none – the user would in most cases prefer a simple

handpump. The *PlayPump* as a ‘gratitude machine’, rather than facilitating the users desires or defiance, locks them into a grim dance with it, distorting the bodies of adults who must operate children’s play equipment to access a critical resource.

Critical vehicles are given to users as a means for them to puncture the complacency or ‘numbness’ of the mainstream of society, “inserting the voice, experiences, and presence of those others who have been silenced, alienated and marginalized” (Wodiczko 1999, p.xiii). The *PlayPump* does not enable communication from users to funders in the first world. The *PlayPump* is a vehicle for ideas decided by its makers and promoters, not users, rather than the combination of the two, as in *Brinco* and *paraSITE*. Through its design, it allows little variance to the message it wants to send. Users are props for the story it wants to tell, and have little way to express their frustration or disempowerment by the system. Rather than puncturing the complacency of the first world ‘unaffected’, the *PlayPump* perpetuates it, through concealing this reality. A challenge presented by the *PlayPump* is how to bridge the gap between its users and its audiences in the first world who support it: how to give a voice to the silenced.

8.4 Critical design

Chapter 5: Critical design examined the work of industrial design academics Anthony Dunne and Fiona Raby, who have defined a ‘critical design’ practice that draws from the arts to produce part-fictional functional artifacts, intended to catalyse debate on social issues. Critical design and design for development were described in Chapter 5 as on either end of a spectrum of response to mainstream design practice – where design for development aims to supply the needs of a different set of ‘clients’, critical design more fundamentally questions the productive drive of design. We have described contemporary design for development objects, such as the *PlayPump*, as objects also used to communicate issues to audiences, and so critical design presents another perspective on this mode. Both fields use ‘industrial design’ as a popular medium for communication to publics. But unlike design for development, critical design objects are not intended to have a large-scale impact on social issues through their immediate use.

Chapter 5 focused on Dunne & Raby’s work *Placebo Project* and *Is this your future?* as examples of their practice. Through describing and discussing these projects we drew out their ideas and terminology to describe facets of a critical design practice, and ways in which objects might have extra-instrumental functions: these were grouped under the headings ‘Para-functionality’, which describes how function can be a form of criticism, and ‘Material Tales’, which explores their use of objects as characters that evoke narratives.

8.4.1 ‘Para-functionality’

Dunne used the term ‘para-functionality’ in *Hertzian Tales* to describe the functions an object might take on besides its instrumental use – especially the way it might interrogate the social sphere around it, provoking questions around laws, ethics, or the direction of technological development. Such objects might take on ‘critical’ functions by revealing aspects of the systems with which it interacts. Dunne’s description of the ‘post-optimal’ object is loosely grouped here under the heading of para-functionality, along with ‘the gadget’ as a form of para-functional object.

While Dunne & Raby design objects which exploit this capacity for para-functionality, Dunne also identifies objects in the ‘real world’ that have para-functional qualities. Jack Kevorkian’s *Thanatron*, for example, is a machine designed to facilitate suicide. Because its design challenges legal and social mores, Dunne describes it as materializing “complex issues of law, ethics, and self-determination”, showing how “an industrial invention can be a form of criticism” (2005, p.43). In our interview, Dunne identified too how design for development objects could be read as having para-functional qualities; indeed, design for development in presenting itself as ‘a revolution in design’ frames its designed objects as ‘a form of social criticism’: of design as catering only to first world desires.

Some design for development projects draw attention “to the narrowness of our obsessions as designers in the Western world”, Dunne said, by presenting examples of other real-world roles design could play, implicitly critiquing commercial first world industrial design (2008). “I think that when I see something like the *LifeStraw*, whether it’s effective or not, it certainly makes me reflect on my own practice and its value and so it has this kind of... maybe it’s not critical design, but if it was published and presented, exhibited in a certain way back in the Western world, developed world, it could take on a critical role” (Dunne 2008). The *One Laptop Per Child* too could function like critical design. “Just by its existence it creates fantastic debate around the role of the Western world [in the developing world]... It takes on a critical function without ever intending to”, Dunne surmises (2008). Perhaps “thinking into” the context of the developing world, Dunne muses, “creates a friction that is quite interesting”, “amplifying these issues that you get a glimpse of when something like [the *OLPC*] gets done” (ibid).

The *PlayPump* could be described as sharing this broad quality of ‘para-functionality’, in proposing that design innovation be directed towards helping the poor in the developing world. More specifically, as ‘an industrial invention as a form of criticism’, the *PlayPump* could

be read as a challenge to the existing appropriate technology and water development sector, which promotes user-led maintenance and management of water supply. The *PlayPump* instead proposes a service-based model, where a centralized for-profit organization maintains and manages pumps for users, challenging the orthodoxy that decentralizing control to users is the route to sustainability. The *PlayPump* serves as a critique of this notion, suggesting that rural developing world citizens should be treated more like first-world consumers, who can be offered as a market for advertisers, and who like first world consumers, shouldn't be expected to understand or be able to repair their own technologies. This chimes with the trajectory in design for development identified in Chapter 4: Fluid technology.

As Dunne said about the *LifeStraw*, if the *PlayPump* was presented in a certain way in the first world, it could take on a critical role. This is in part the intention of this thesis – to read and present the *PlayPump* in such a way that it reveals the risks in contemporary trends in designing for development. We could see the para-functionality of the *PlayPump* too in the way it introduces an 'extra' function for the developing world user: 'celebrating', or 'showing gratitude' whenever they need to access water: a 'gratitude machine' as early described in this chapter. It is not hard to imagine this as a function a critical design object might have – though it would be more likely presented as a satire of aid and the relationship of developing world and first world donor countries, perhaps.

In further conversation, Dunne pointed out the tension between the 'productive' mode of design for development's response to the failings in mainstream design, and a critical design response. "Designing things that are too realistic or too close to reality", said Dunne, can prevent people from fully grappling with the complexities of the problems they address (2008). Such objects "quickly get absorbed and people think the problem is solved" (Dunne 2008). This, Dunne thought, might apply to some of the design for development objects I showed him, including the *PlayPump*. This is the problem with the type of 'awareness raising' the *PlayPump* accomplishes, as touted by its backers – because it makes exaggerated claims for its capabilities, presenting itself as the answer to the problem of water provision in the developing world, audiences think that the solution has been found. The *PlayPump* acts in this way as a panacea, perpetuating rather than disrupting the 'anaesthesia' or 'numbness' of the first world public described by Meireles and Wodicsko. Rather than producing reflection (or even anxiety) in their user-audience, as *Placebo project* did by making users more aware of electro-magnetic waves, the *PlayPump* is instead 'absorbed' without difficulty.

Where some of the objects in *Placebo project* acted as a placebo for their users, such as the *Electricity drain*, whose user "certainly found it to have a beneficial effect, even if it was very

slight” (Dunne & Raby 2001, n.p.), the *PlayPump* acts as a placebo to first-world supporters and donors to the project. By buying One Water they can “rest assured that they are helping people in the developing world” (One Water c.2008), or by putting money into a machine in an amusement park, people can receive the thanks of children in the developing world. The Facebook pages for *One Water’s* campaign to install more *PlayPumps* overflows with their supporters’ emotional self-congratulation about the good they are accomplishing for people in the developing world by supporting the project. But as the work in Chapter 7 shows, *PlayPumps* are retrogressive in developments in water supply technology, cost far more and accomplish far less. Like the objects in *Placebo project* which do not really perform their supposed function, but reassure their users nonetheless, the *PlayPump* is a sugar pill for first world supporters.

8.4.1.1 The post-optimal object

Other objects in *Placebo Project*, as noted above, elicited anxiety in their users rather than reassuring them. The temporary owner of *Electrodraught excluder* told Dunne & Raby how she “found it quite emotionally and intellectually tiring and wearing to use after a while” (Dunne & Raby 2001, n.p.). In making the users of their objects in *Placebo project* uncomfortable, and in being interested in how the ‘faultiness’ and unpredictability of some of their objects caused particular reactions in their users, Dunne & Raby were working with the qualities of what they call the ‘post-optimal’ object. With a high degree of efficiency now quite easily attainable in (electronic) objects, the designer’s role, Dunne posits, could now be to explore more interesting interactions between users and technology: including “user-unfriendliness... a form of gentle provocation” (Dunne 2005). While the *PlayPump* and its partners’ campaigns avoid making their audiences and supporters uncomfortable, with One Water promising to “never employ tactics that make you feel pressured, put you on a guilt trip or make you feel bad” (‘Mark’ 2010), the *PlayPump* does act like a ‘post-optimal object’ in making its users in the developing world uncomfortable: Chapter 7 recorded the back pain, the increased physical labour and the indignity caused to the pump’s adult users.

The *PlayPump* could be described as a post-optimal object: there are already many technically efficient handpumps, and while the difficulties with water-supply in rural Africa are many, “the up-and-down arm motion required to operate a standard pump is not one of them” as Owen noted dryly on his blog (Owen 2009a). This is the main mechanical modification the *PlayPump* makes to a standard water-pump; it has made more of a contribution in ‘poeticising’ interaction with the pump (to use Dunne’s term), creating an ‘experience’ for the user, than it

has in advancing the technical efficiency of the water-pump. But whereas the users in *Placebo project* had volunteered for a temporary experience with a non-essential device, the users of the *PlayPump* did not volunteer to use it, and the device is intended as a long-term means of providing a vital resource. In contrast to Dunne imagining "...the user as a protagonist and co-producer of narrative experience rather than a passive consumer of a product's meaning" the user is entirely subject to the product (2005, p.69). Here Dunne's reservations about extending critical design beyond the first world are validated: critical design objects for actual use need to be temporary and non-essential. The *PlayPump* acts as a 'post-optimal' object, inducing a performance in its users, though the context for its operation is inappropriate to post-optimalism.

8.4.1.2 The gadget

In *Hertzian Tales*, Dunne writes about the attraction of the 'gadget', as an example of a type of para-functional object which produces that "psycho-behavioural factor: wonder" (Dunne 2005, p.50). The *PlayPump* has the quality of the gadget, eliciting instant wonder at the narratives it communicates so effectively to audiences, as described in Chapter 2 – its positivity and promise of joy, its self-evident cleverness and innovation, its magic, and child-like ease of use. In its 'multifunctionality' too, with its claims to entertain children, pump water, redress gender imbalances, send children to school, and so on, the *PlayPump* is also reminiscent of similarly multifunctional '10-in-1' gadgets from the 'netherworld' of home-shopping catalogues. Most audiences do not encounter the *PlayPump* in the flesh, or in its real setting, but like the viewer of home-shopping catalogues or late-night television, through moving and still images in idealised scenarios of use.

In Chapter 5, we referred too to a particular type of gadget, the Japanese hobby-form, *chindogu*. The *PlayPump*, this thesis argues, is a type of *chindogu*, though it has been taken seriously in a way no *chindogu* is intended to be, or should be. Like some *chindogu*, its 'innovation' relies on harnessing an apparently free source of energy – the energy of children playing. The president of the International Chindogu Society, Dan Papia's, description of the *chindogu* 'design process' sounds very much like the *PlayPump*, now that we know more about its failures:

Suppose you wanted to, say, create a tool that would prevent you from losing your keys all the time. You might wonder about how to do it and one idea you might stumble upon is that you lose your keys because they're small and if you had a REALLY BIG key holder, say the size of a baseball bat, you'd never lose your keys because all you'd have to do is check around the room looking for

the baseball bat. Then it might occur to you that it's going to be hard to carry a baseball bat with you at all times and it might invite various types of trouble when unlocking doors... the first idea wasn't quite useless – it would have worked – but it's usefulness was undone by something that created a new problem. So it was unuseless. But now that you think back upon the first idea, you realize it was funny in a sad kind of way. And you decide that, now that you have some time, you can build it and it could be a sort of three-dimensional joke to show to people. Only where did you put the keys to the work shed? This is what a *chindogu* is. A tool that doesn't quite improve our lives but is fun to look at because it's really weird (Papia n.d.).

The *PlayPump*'s innovations, to add the roundabout, the water tank and its billboard tower, were first-level ideas that offered a theoretical advantage to the system, but because they didn't work in the way intended, they became a hindrance. To paraphrase Papia, these first ideas weren't quite useless – they could have worked – but their usefulness was undone by some things that created new problems. These problems were created for the user; the *PlayPump* as image still did its job fine. *Chindogu* function just fine as images too, as ideas in the form of objects – but their humour relies on the absurdity that their real use would engender. That the *PlayPump* could be taken seriously indicates the imbalance of power between users of the system, who experience its failure, and its viewers in the first world, who do not, as will be argued in the conclusion in Chapter 9.

8.4.2 'Material tales'

Placebo project and *Is this your future?* are examples of 'material tales', using Dunne and Raby's term. In *Placebo project*, functional objects are inserted into volunteers' homes to create 'real fiction' through their interaction with users; the objects act as something between a prop and an actor, introducing a narrative into 'real life'. *Is this your future?* was less an intervention into real life, more the creation of fictional photographic tableaux composed of supposedly functional objects from the future, in interaction with human actors. The tableaux conjured the possible social implications of new developments in technology. Real-fiction "discusses systems of presentation and consumption for ideas that, unlikely to be mass-produced or even prototyped, exploit the conceptual status of objects as ideas" (Dunne 2005, p.xviii).

It is possible to read the *PlayPump* as a 'material tale' that shares the properties of both projects. On the one hand it is a prop introduced into the world, which interacts with real-life users, like the objects in *Placebo project*. On the other, it is presented through tableaux that,

considering how little relationship they bear to the way *PlayPumps* are used the majority of the time, may as well be fictional. Promotional photographs for the *PlayPump* share similarities with the photographs from *Is this your future?:* a novel object harnesses an alternative energy source to produce a new way of living, in which water is supplied to communities in need through effortless children's play. The project's aims have been ambitious, utopian in their scale: meeting all of South Africa's water needs, or supplying water to 10 million Africans by 2010. Where the objects in *Placebo project* are intended as one-off designs, specifically not intended to be brought to mass-production, and those in *Is this your future?* only suggest real-life functions, *PlayPumps* are intended for mass production.

Where the scenarios in *Is this your future?* are constructed so as to invite questioning of the ethical and social implications of this new technology, to undermine simplistic notions of utopia – combining optimism with misgiving – the *PlayPump's* scenarios do not. They present only a positive image of their use. More than that, they conceal the real consequences that the installation of *PlayPumps* has had for communities. Like *Is this your future?*, the depictions of the *PlayPump* presented by its supporters are fictional constructions; in the case of the *PlayPump* because they do not represent the way the device is really used. Their intention is not to have viewer's question what possible negative consequences the use of children as source of energy might have, for example, as *Hydrogen future* does. Nevertheless, these are questions that are raised by spectators to the project, such as WaterAid and UNICEF, who are concerned about the *PlayPump's* use of 'child labour'.

Dunne identified the way in which design for development projects could be read as critical design scenarios – for their social and ethical implications – whether they invited this or not, as discussed under 'Para-functionality'. As part of my interview with Dunne, I showed him a series of slides of design for development projects. Dunne reacted to a slide depicting the *Lapdesk* project, a South African scheme for supplying children with portable school desks. Following a similar plan to the *PlayPump*, the private enterprise producing this 'public benefit' gives away the desks for free, but makes their profits by offering the desks as a medium for commercial and public-service advertising.

Like the *PlayPump*, the *Lapdesk* company promotes their product as enabling businesses to target "hard-to-reach emerging market communities" (The Lapdesk Company n.d.). Where the *PlayPump* has been described as 'billboards that pump water', the *Lapdesk* company describes their product as "a walking billboard", which because it is given to the child and not the school, "interacts with the youth, community and family environments every day. Its size, shape, longevity, and portability ensure that your logo, brand or message receives sustained

exposure to multiple audiences over an extended period of time” (The Lapdesk Company n.d.). I constructed the slide I showed to Dunne, in fig 8.3 below, from photographs and text from the *Lapdesk* company website.

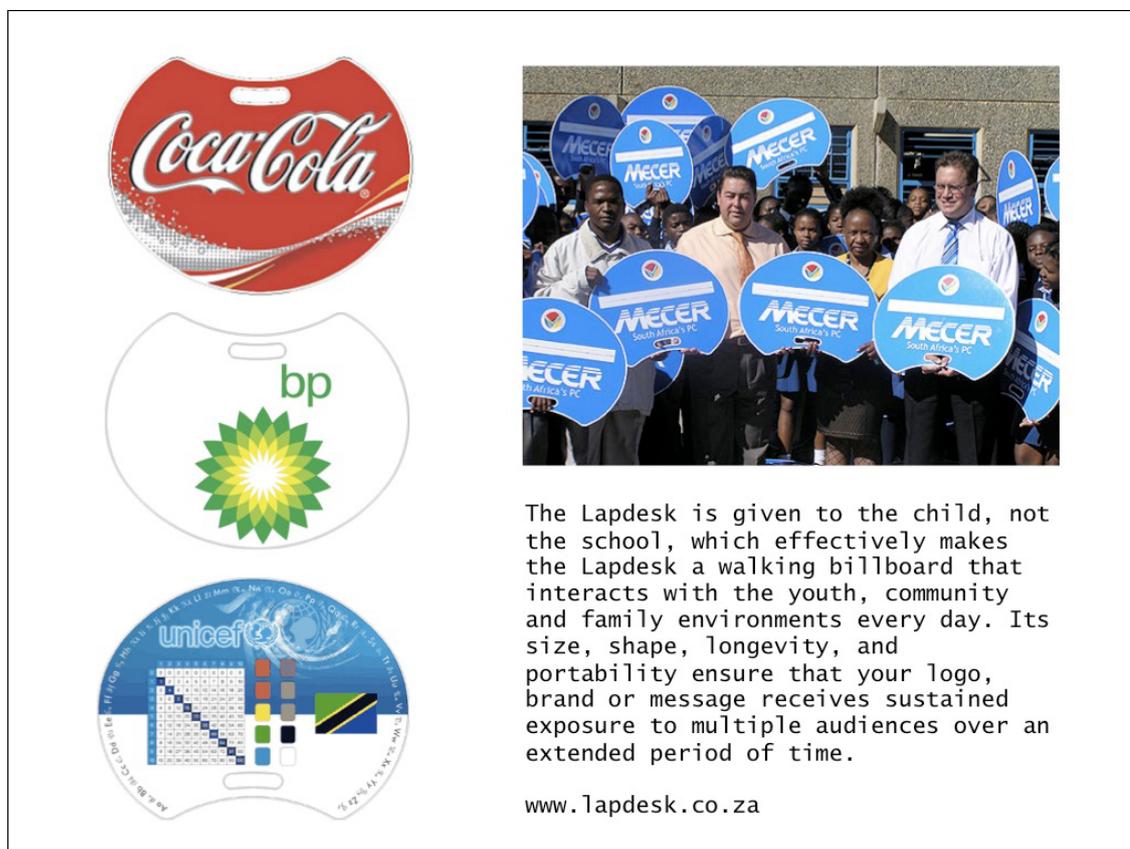


Fig 8.3: A slide from my presentation to Anthony Dunne in the course of our interview, 2008

“If you had just shown me that slide” Dunne said, “I would think it’s maybe a project you’ve done, or a designer’s done to make a point... it seems like a parody” (2008). “They *are* critical designs”, Dunne laughed, “that’s what someone might do to highlight how cynical companies are in trying to promote their brands... they would do a project like that with innocent school children in the third world and say ‘Look, this is what would happen if companies got involved’ and everyone would go ‘Oh my god, that’s disgusting, why can’t they just give them these things’. And [yet] that is real, it’s worse than critical design and more effective” (ibid).

It is possible to construct a relationship between a photograph of the *Lapdesk* project and a photograph from *Is this your future?* to illustrate Dunne’s observation, as show in fig 8.4 on the next page – though this twinning does rely on other superficial factors such as the colours common to each photograph.



Fig 8.4: Critical design or design for development? *Is this your future?* (2004) and *Lapdesks*.

The photograph of a *PlayPump* installation in the diagram at the start of this chapter (fig. 8.1), taken in KwaZulu Natal, South Africa in 2010, shows a boy drinking from the faucet. Before he could drink from the tap, he had to turn the roundabout wheel to pump a little water to the tank (I helped him, as I was there). How could we read this scene, if like Dunne we were to treat it as a critical design scenario, a ‘material tale’? We would need to know a little about it: that these are billboards, with no advertisements, and that to get water to the faucet the roundabout needs to be turned, to pump water up to a tank hidden behind the billboards; and that this is one of many such installations scattered around rural southern Africa. Then perhaps we could perform a small imaginative exercise, and read this ‘real fiction’:

The billboard tower is the most prominent part of the scene. The blankness of the billboards makes this installation seem mysterious, and abandoned – what messages were on them? From the position that this photograph was taken, I could see two other identically blank towers in the landscape. With nothing else much like them in the vicinity, and few people around them, they seemed like strange totems in the landscape, of function unknown. Seeing them en masse in the wider area was a strange experience, blank tower after blank tower, almost a post-apocalyptic scene – ‘desolation’ was the word I wrote in my

notebook to describe the feeling it gave me. The roundabout is odd too – a piece of playground equipment, out where one least expects it, isolated from anything else like it; like a fragment of an abandoned funfair. And how strange that turning the roundabout produces water from the faucet! But almost as if one has to offer the billboards a libation, water must be pumped through them before one can walk over to the faucet and drink it.

What could such an imaginative writing/reading reveal? It strikes me as a potent metaphor that water must be pumped to the height of the billboards before it can be accessed by the user. This is a very literal, physical way in which the billboards are prioritized – ‘elevated’ – in the physical system. This does reflect the priorities of the makers, to produce ‘billboards that pump water’. If the installations seem abandoned, that reflects the lack of maintenance reported by studies in the field. And if alien forms dropped into the landscape, that too – they weren’t built on existing practices for acquiring water, or placed there through the requests of the community. And thinking that a children’s roundabout, or children’s play, would be a reliable way of accessing a vital, daily resource has been demonstrated to be at best a naïve utopianism. At worst, it conjures a ‘design noir’ story in which poor communities are forced to perform a parody of play (as explored earlier in this chapter), forcing users to ‘celebrate’ the generosity of their benefactors every time they need water, genuflecting beneath blank advertising billboards. It might suggest some strange science-fiction (or ‘social-fiction’) scene, a dystopian vision of the future, in which a corporation only supplies water points on the condition that advertising billboards accompany them. But, continuing this story, the scheme was since abandoned as the users around the water point didn’t offer any commercial value to advertisers after all – and so here they still are to this day, semi-functional, used by the occasional person who needs a drink of water.

This reading bears a strong relationship to the real history of the *PlayPump*, in which users really are provided water on the condition that they become audiences to advertising and other messages, and that they conform to the vision of use decided by its makers and supporters. This reading is not an accident of course, as I know the history of the *PlayPump* – but perhaps it suggests the possibility for other interpretations of the *PlayPump*, which it has somehow, largely, evaded. And there is some support for the idea that one can ‘see’ the failure of the pump in images such as these; the director of a water development company who is critical of the *PlayPump* sent me a similar photograph he had taken, in fig 8.5, next page, and although he was reluctant to speak on the record because of the influential people involved in

the *PlayPump* project, he asked me to just look at the photograph and to know that “what you see is what you get!” (Anonymous 2010).



Fig 8.5: A photograph of the *PlayPump*, sent to me by the director of a water NGO.

8.5 Antiprograms

Chapter 6: Antiprograms examined the direct actions of the Anti Privatisation Forum (APF) in securing access to water and electricity for poor South Africans, while conducting protests and taking part in legal actions against state policies around privatisation of services. In acting immediately while communicating to audiences, the APF was seen in parallel with the other examples of similarly multifunctional objects in this thesis, including the *PlayPump*. The APF’s actions, especially the removal of prepaid water meters, were contextualised within the resistance to some measures for development visible in the developing world.

Langdon Winner’s identification of some apparatus as having ‘political properties’, that may be used to settle issues in society, was extended to the prepaid water meter. The APF’s removal of prepaid water meters was seen through Bruno Latour’s formulation of ‘programs’ and ‘antiprograms’, as a means of attempting to return ‘steel to words’, to return social issues to debate. In this way the APF’s actions can be seen as both ‘protest and participation’, drawing on Isaac Davids’ depiction of ‘provided’ and ‘popular’ spaces for participation. We can examine the *PlayPump* using these perspectives.

8.5.1 Programs and antiprograms

The state in South Africa installed prepaid meters to advance its program for water privatisation and cost-recovery. What is the ‘program’ that the *PlayPump* helps to reinforce, if we think of it in a similar way, working back from the object? We could think of a few interpretations through this lens: the *PlayPump* as part of a program to propagate itself; a scheme to provide income for an outdoor-advertising company; a program to supply water through play; or to introduce a new model for maintenance of ‘appropriate technologies’, based on service rather than self-help.

A large-frame interpretation is perhaps that the ‘program’ is to have the private sector take care of development, with profit for itself as the incentive – this is the direction for design for development advocated by Polak, as noted in Chapter 3: Fluid technology, and by Field: “It’s my opinion that if you want something done, use the private sector. You are on the line to pay the salaries and meet expenses. If you want to get things done you go with a for-profit organization because that way you have the incentive” (Gingerich 2008). The *PlayPump* is the mechanism for this program, moving the script along: a device for attracting charitable donations to pay for it, at no cost to the for-profit business that manufactures and installs it, and then continues to make money from its billboards for the lifespan of the pump. Other apparatus performs a similar function for the same program: the *Lapdesk* for example. From this perspective, the *PlayPump* is one example of a technology called in to advance a more general program.

There is also evidence that in order to keep advancing this program (moving along the ‘association’ axis, according to Latour’s diagram in Chapter 6, fig 6.5), the *PlayPump* may have to be altered in response to mounting criticism of the clear faults in the apparatus (moving down the ‘substitution’ axis). Roundabout Outdoor representatives told me in 2010 that they are planning to separate the elements of the *PlayPump* from one another: to have billboards in the city that fund *PlayPumps* in the countryside, to have roundabouts just as roundabouts, not drivers for the pumps, and to use solar water pumps to pump water to the tanks (Melman & Morris 2010). In exploding the elements of the *PlayPump*, if they do so, they will be changing the ‘sociotechnical assemblage’ with the intention of still moving the script in the same direction – managing development for profit. With the withdrawal of major support, the progress of their particular script has slowed down, though *One Water* and Roundabout Outdoor are doing their best to advance it.

An advantage of the prepaid meter in advancing the interests of for-profit water suppliers, as noted in Chapter 6, is that ‘providers’ and ‘consumers’ do not have to interact directly – so avoiding administration, unpaid bills, and confrontation over water cut-offs. In the case of the *PlayPump*, Roundabout Outdoor is insulated from users of the pumps in that maintenance crews are not present in the community. Outside South Africa, contractors will service a wide area, with 100 pumps per installation crew the model aimed at. In South Africa, Roundabout Outdoor in Johannesburg services the whole country. Once installed, sometimes as many as 9 pumps in an area in one day, according to One’s records, Roundabout Outdoor retreats back to the city, and are contactable only via SMS. Their record of responding to maintenance requests is poor, and there is no one locally accountable. But another relationship in which interaction does not have to take place directly is between individual supporters in the first world, and users of the pumps. The image of users and their interaction with the pump transmitted to supporters does not reflect the critical reports studied in Chapter 7: supporters need not know of the failure of the pumps. There are some supporters, including individuals from the first world public, who make the journey out to *PlayPump* installations in the developing world – and still encounter scenes that correspond well to the project’s publicity. Why this is will be discussed in Chapter 9: Conclusion.

While left with the *PlayPump*, with Roundabout Outdoor or their contractors far away, users grapple with an obstinate machine; as Latour writes, machines ‘cannot be argued with’. Introducing artefacts to the script results in ‘steel and silence’. The *PlayPump*, as a nonhuman object, does not care if the user does not want to play – they must use the roundabout all the same. It is as implacable as the prepaid meter: hard day at work in the fields? Try playing on the roundabout. Following Latour’s dictum to imagine what a human would have to do if the machine was not present, or to characterise the *PlayPump* as a person, we might imagine it as a facile creature that wants to play, no matter what mood you’re in. A child, perhaps more charitably, that doesn’t understand that an adult does not want to play? A stubborn clown, that won’t admit its audience is tired of it? If a human, its behaviour would most definitely be ‘inappropriate’.

The prepaid meter, it was observed in Chapter 6, worked to allow the Constitutional Court to argue that its suspension of water supply to the user was not in fact a cut-off, so requiring a court hearing, but a ‘temporary suspension’. This ‘little man’, borrowing Latour’s formulation, performed the work required of it, to detach responsibility from the state. How might this apply to the *PlayPump*? The *PlayPump*’s roundabout performs some of this type of work: as an iconic piece of playground equipment, it seems to have rendered audiences to the project

incapable of imagining it used in any way but for play. The roundabout's presence signifies fun; it is almost an argument in itself – the *PlayPump* is operated by a roundabout, therefore it must be fun to use. It has a self-evident logic to it that has made for a near-universal interpretation, from a distance, that the *PlayPump* works the way it is supposed to. To picture adults pushing the roundabout around by hand as a repetitive chore requires a leap of imagination; the more potent image is the one the *PlayPump*'s producers are glad to reinforce, of children playing. Here too, the roundabout serves its purpose well, as an argument in an object, evidence for the validity of the *PlayPump*'s premise.

Latour describes objects as having 'prescriptions': "values, ethics and duties" which are delegated to the apparatus (Latour 1992, p.234). A 'duty' which the *PlayPump* takes on, and takes away from the user, is maintenance. Where the Zimbabwe Bush Pump seeks to involve the user in its installation and maintenance, giving them certain responsibilities, the *PlayPump* operates on a service model, prescribing a passive user. The kind of user the *PlayPump* makes is disempowered. They do not know how the machinery works, and they are not able to modify it, or fix it when it breaks. The user has no role to play, but 'play' – they are infantilised by the *PlayPump*; which is of course quite literally an infantilising machine, as children are the user group physically inscribed into the apparatus. Adult bodies are distorted by using it. In that sense too the *PlayPump* demands that they be children.

What other kinds of behaviour does the *PlayPump* prescribe in its users? The prepaid meter's reduction of supply and commercialisation of water brought discord to communities, with families arguing over water, and generosity to strangers diminished. Similar social ill effects were observed for the *PlayPump*, as noted in Chapter 7: causing tension in communities whose neighbours drew on their resources because their *PlayPump* didn't work, for example. Erpf noted a particular social ill-effect as a result of the *PlayPump*'s configuration:

The mission experienced a new phenomenon in the local communities, in which daily work like collecting water is mostly done together. With pumps that discharge the water directly it's common practice helping each other. In all communities visited, the mission found that women are pumping now alone without supporting one another. This leaves pregnant women, elderly, disable and sick people without water because they are not able to join in operating the pump (too heavy, provoking back pain). When water is pumped into a tank it is not possible to access how much water is pumped. Thus women pump alone just as much to fill their own jerry-can (Obiols & Erpf 2008, p.41).

By Erpf's analysis, people's generosity is diminished because they have to pump water to the tank, and this means that they cannot accurately measure how much they are pumping. This is exacerbated by how hard the roundabout is to use as a pump for adults, and the fact that children's play does not fill the tank as intended in the design. People were formerly willing to help each other when they had a tangible measure of how their labour and water was distributed. An unanticipated consequence of the water tank is that it obscures this, and so makes people less willing to help each other. The tank prescribes this behaviour; and the old, pregnant, sick and disabled are the hardest hit by this diminishment in the 'values, ethics and duties' of the community.



Fig 8.6 A 'hacked' *PlayPump* photographed by the author in KwaZulu Natal, 2010.

What possibility is there for 'antiprograms' to the *PlayPump*? The APF responded to the government's program by removing the apparatus that reinforced it. Removing the prepaid meter allowed people access to the mains supply they had before, or removed the obstacle in a new connection to the water system. An antiprogram against the *PlayPump* is a trickier proposition. Communities don't know how it works, and spare parts are not available, making modification difficult. Just removing it would not give them water, as it is not a mains supply, but a borehole. They could replace the *PlayPump* with a handpump, and perhaps there is a call for 'radical plumbers' to undertake the task of removing roundabouts and replacing them with

handpumps. In South Africa, I came across one example of what appeared to be direct action against a *PlayPump*, to improve users' access to water. The photograph in fig 8.6, previous page, shows an untagged *PlayPump* installation in KwaZulu Natal in which the concrete standpipe was knocked down, and the pipes running up the water tower were broken. The pipes leading from the roundabout to the water tank had been dug up, and cut open, so that users no longer needed to pump water up to the level of the billboards before they could access it. Perhaps tellingly, this was the only *PlayPump* installation, apart from where I saw the boy drinking, that I saw in use – two adults were there washing their belongings, though they couldn't tell me about the history of this installation.

If the roundabout was replaced by users with a handpump, it would still need a maintenance system to support it, if it was not to lead to another abandoned installation when it broke. I took it as telling that the Roundabout Outdoor tag, which identifies the pump for requests for maintenance, had been removed in the 'hacked' *PlayPump* above – it appeared that this installation had been taken out of the maintenance system, possibly in retaliation by Roundabout Outdoor for this user modification. Or perhaps it was hacked because they would no longer repair it. A program of education in pump maintenance could be a possible component in a campaign to replace roundabouts with handpumps. But buy-in from local authorities would seem to be a likely necessity. In Mozambique, user complaints did lead to *PlayPumps* being replaced by handpumps, restoring government programs. The co-operation of the state or development organisations would seem to be desirable for acting against the *PlayPump* object, if the aim is to improve access to water – though as the APF's actions in South Africa show, their direct actions against the prepaid meter to restore access to water were accompanied by public protest and other civil campaigns, and antiprograms against the *PlayPump* could engage in this terrain without the co-operation of government.

8.5.2 Protest and participation

While the City of Johannesburg claimed that prepaid meters 'empowered' residents by allowing them to 'take ownership' of their water use, the actual experience of poor water users, who preferred the previous unmetered standpipes, was of disempowerment and dissatisfaction with the meter. The *PlayPump* is likewise presented as empowering communities, especially women and girls, and it is presented as 'belonging to' the community. Again, we know the real result of the *PlayPump* is to increase the work of women, and to frustrate communities who largely preferred the handpumps they had before.

In both cases, the lack of consultation prior to installing these new technologies contributed to user dissatisfaction. Chapter 6 describes the combination of incentives to install prepaid meters – residents would receive flush-toilets for example – and threats: water charges would be raised, or their water cut-off entirely if they did not comply. For the *PlayPump*, where representatives were consulted, they were sold on the idea that the *PlayPump* would not require repair like existing handpumps, and that the *PlayPump* would solve the problem of maintenance. Where existing handpumps on boreholes were broken or faulty, they were replaced with *PlayPumps* rather than being repaired as the communities, in retrospect, would have preferred – so taking advantage of the community's need.

The installation of *PlayPumps* in Mozambique and Malawi was agreed at a governmental level, and with varying degrees at lower levels of representation, but clearly not at the level of users. Davids in Chapter 6 identifies the problems in relying on 'structured participation', dealing only with set representatives of communities: citizens should not be "straitjacketed into provided spaces such as ward committees and development planning forums" (Davids 2006, p.13). Approval from ward committees in Orange Farm was, according to the APF, corrupted through representatives being awarded tender contracts in implementing the prepaid meter. In Mozambique, local contractors were similarly incentivised to find a desired number of sites for the installation of *PlayPumps* within an area, sometimes replacing working pumps as a result, against the interests of the community, leading to Erpf to remark, as noted earlier: "that several local partners, only driven by the ambition of easy money, had taken advantage of presenting poor quality work. The consequences are high costs for the frequent repairs and complaints from pump users due to the lack of their involvement on the process" (Obiols & Erpf 2008, p.28).

Roundabout Outdoor and PlayPumps International claims to have engaged in consultation and participation with communities. Field described how communities only get a *PlayPump* "if they want it; they don't have to have it... We have community liason officers who go out and see if people want it... so they can understand exactly what they're going to receive...it's not something that we foist on people" (London 2007). A partial explanation for the difference between the *PlayPump's* claims for participation, and they reality for users on the ground, is the problem Davids identifies with some types of structured participation. In Orange Farm, speaking to ward committees was not sufficient to consult communities. SKAT in Mozambique noted that it was important for the *PlayPump's* representatives to "recognize that explaining only to the school director will never ensure passing the knowledge of the

communication system to others and it might be lost by the frequent fluctuations of school personnel” (Obiols & Erpf 2008, p.29).

Owen interviewed three teachers at a school in Malawi about their experience with a *PlayPump* that had been installed at the school a year before. A video and transcript of the interview are posted on his site. The teachers described how “all of a sudden, they came, a certain organization, to replace that borehole with the *Playpump*... they didn’t ask us... they said the government invited these Playpumps from South Africa, so we want to try these here in Malawi” (Owen 2010a). The school was not happy with the *PlayPump*: they had to stop their food gardening, because the water it provided was less than the handpump they had before, and the *PlayPump* was difficult to use – they said they’d prefer their old handpump back. “We had no problems with the borehole. Everything was alright. [The PlayPump was installed] because they said “we want to try this technology” and our school was picked as a pilot project” (ibid).

A visitor to Owen’s site, ‘Tony Breaker’, who seems to work with *PlayPumps* in some capacity, posted a comment contradicting the teachers’ account: “we do work with the Malawian Government on this project”, he wrote, and “the school heads signed consent forms prior to the PlayPump being installed, it was well described to them (video on a laptop)... we have two letters one from each school ... signed by the school heads that say they are very happy and grateful for the Playpump installations” (ibid). One response to this claim is that we know the documentation and publicity produced around the *PlayPump* to be deceiving: the video they would have been shown was a ‘material tale’, not an accurate depiction, and the claims for the pump’s performance they would have been offered were false – so this would not have been informed consent.

Another visitor’s reply points to a more general caveat: after 40 years of receiving development aid, people in Malawi may “feel an obligation to accept aid on whatever terms it is given”, and that “what we as outsiders fail to recognize many times is that our mere suggestion of a “solution” is often not accepted based on its merits or feasibility, but rather due to our position and many, many years of disempowerment” (ibid). Their comment highlights the difficulty of securing meaningful ‘consent’ within highly unequal power relationships. In addition, the teachers’ own account, and Tony Breaker’s comment, indicates the structure of the ‘participation’: the government decided, the school was ‘selected’, and the teachers acquiesced. The decision to implement *PlayPumps* takes place at a higher level, through ‘representatives’, with the consequences that Davids and Erpf point out.

Dauids points out that some structured participation is necessary in development processes; “effective municipal governance is essential”, for example (Dauids 2006, p.13). Wafer also points to the rise of social movements and protest in the developing world as a result of the inability of the post-colonial state to occupy a central organising role in society. In this light, we can see the *PlayPump*'s relationship to structures of local governance as ambiguous. While identifying its over-reliance on higher levels of representation, with negative results for users, we can also see its capacity to undermine local structures of governance. We noted in Chapter 7, in contrast to the Zimbabwe Bush Pump as a ‘national standard’, that the *PlayPump* overrides national standards in the countries in which it is installed, “circumventing Government policies and planning frameworks” (UNICEF p.14), leading to complaints from users to their representatives.

And where a task of past water projects has been to work out ways for communities to manage water, through water point committees for example, the *PlayPump* washes its hands of this: when asked how water from the *PlayPump* is allocated (as this is a classical problem in water supply), Field replied “That’s something we leave up to the people” (London 2010). PlayPumps International Africa replied similarly to Erpf’s query about meeting minimum standards for water supply: “We do not police how the water is used or distributed as the school/community is the rightful owner of the pump” (Obiols & Erpf 2008, p.40). Not only do they fail to recognise the need for water allocation schemes, they undermine existing user-led structures for water management:

Some PlayPumps have been installed in communities with functioning water user committees. Existing pumps (Afridev) were replaced by PlayPumps and the water user committees were stripped of their task to organize and maintain the water point with pump and to collect money for maintenance and repair interventions (Obiols & Erpf 2008, p.19).

Erpf notes that a major problem in *PlayPumps* shared between communities and schools is water allocation; and that a result of the technical configuration of the *PlayPump*, whose tank obscures the results of people’s labour and ability to measure water distribution, is social discord, as earlier described. Water allocation and management cannot be left unstructured, and it is all too convenient for the *PlayPump*'s producers that this is where they leave things up to the users.

Field’s account of the history of the *PlayPump* project makes it very clear that the project was not advanced through needs derived from the ground, but from opportunities offered and

decided from the top, at the level of governments and higher: by powerful transnational bodies. As he describes it in a couple of garrulous interviews, personal encounters and high-level connections played the major part in each step of the *PlayPump*'s success, first within South Africa through the connections with corporations he had established while working in advertising, and through relationships with the South African government, and then internationally, starting with his encounter with World Bank representative Dr. Ross Paul at the *PlayPump* school launch in 2009, who helped Field apply for the World Bank Development Marketplace Award by personally typing up the online application on his computer for Field (Greene & Stellman 2009, p.176). Field went back every year to the awards ceremonies, which is where he met a representative of the Case Foundation in 2005, and after he personally showed the Cases around South Africa, "they were sold on the project", leading to the project's major funding in 2006 (Melman & Morris 2010).

But even before meeting the Cases, soon after winning the World Bank award, Field recounts, "my cell phone goes off and guy on the other end says, "Hi Trevor, this is Dr. Michael Sinclair from the Kaiser Family Foundation in D.C. We've seen what you've done with the PlayPump® and like it a lot. We want to give you \$5 million at your discretion" (Gingerich 2008). Sinclair wanted Field to partner with someone he could trust, which is where Field's relationship with Ronnie Kasrils, then Minister for the Department of Water Affairs and Forestry, came in useful, who entered into a public-private partnership with Roundabout Outdoor to facilitate the Kaiser Family Foundation donation. When Field wanted to establish an "incentive" for more charitable donations to the project, he again called on Kasrils, to ask "could you give a tax break or something?" (ibid). Kasrils called back and "said that he had spoken to Trevor Manuel, the Minister of Finance, and that Mr. Manuel had indicated that the law was about to change in November to allow companies like ours to be able to apply for PBO status" (ibid). The tax department called Field, and expedited his application: where it would have normally taken 2 years to process, Field asked "How do I jump in [sic] the queue?" (ibid). They replied "the minister wants this to happen so we'll see what we can do" (ibid). Field got it in 2 weeks.

These high-level deals advanced the project, with very little validation on the ground, very fast. And while the Cases, for example, may be very influential, "with a small, highly experienced and very well networked team at high political levels internationally and with excellent resource mobilization skills" (UNICEF 2007, p.13), their people didn't know very much about water supply themselves. "There are few staff in PlayPumps International who have on-the-ground (country level community-based) water sector experience" writes UNICEF, "hence

the implementation strategy misses out on compliance with national water policy requirements” (2007, p.14).

The result was to override local policies by placing pressure on governments to accept *PlayPumps*, because of the powerful partners to the project: “governments in some countries such as Zambia and Malawi were subjected to considerable pressure from non-traditional water sector donors to sign a Memorandum of Understanding with PlayPumps International” (UNICEF 2007, p.14). WaterAid’s letter explaining why they do not support the use of *PlayPumps* also describes the *PlayPump* as “assertively marketed in certain African countries”, and they felt it necessary to issue the letter because it had “been approached on a number of occasions and asked why it does not use PlayPumps in its projects” (Martin 2009).

Roundabout Outdoor sought to take full advantage of this pressure, making the explicit request that their partners help to motivate for the installation of *PlayPumps* over other technologies: “We urge government departments, International Donor Agencies, NGO’s and all stakeholders to motivate, *and where appropriate, specify* the installation of the Play-Pump at new and existing sites adjacent to schools, clinics and community centres, for the benefit of all concerned” (my emphasis) (Roundabout Outdoor n.d.).

With such powerful groups involved in the project, overriding the governments of recipient countries, users have little chance of making their objections to the project known. Both UNICEF’s and SKAT’s reports, which relayed some of the dissatisfaction of users, were quashed. The APF’s protests, in Chapter 6, were interpreted in part as a demand for greater participation in development processes. That there is a need for protest from the *PlayPump*’s users is evident, but how can it be accomplished? The restrictions on ‘antiprograms’ to the *PlayPump* were identified earlier. Users in Mozambique had some success in complaining to their district representatives about the installation of *PlayPumps*, and Costello concludes *Troubled Water* by noting that some communities whose *PlayPumps* had been out of action for several months finally had them replaced by handpumps. I note that Roundabout Outdoor on their new website at <http://www.playpumps.co.za/> claims to have agreements with the governments of Malawi, Lesotho and Swaziland, no longer Mozambique, so it seems likely that the government there has now rejected the *PlayPump* programme. Perhaps a target for protest from the users of *PlayPumps*, where their governments are failing to resist pressure from outside bodies, could be their funders in the first world, especially the public who buy *One Water* and raise money for *PlayPumps* in the belief that they are helping people in the developing world. The possibility for creating the means for them to do so is discussed in ‘Further work’ in the conclusion to this thesis, Chapter 9.

8.6 Summary

This section summarises and lists the perspectives arrived at through the application of each of the ‘critical lenses’ in this chapter, following a similar format to the summary of the first half of the reanalysis of the *PlayPump*, in Chapter 7.

8.6.1 ‘Art intervenes’ lens

Through the ‘lens’ of interventionist art, as analysed in Chapter 4, the *PlayPump* was read under two main headings, a) ‘Insertions into Circuits’, and b) ‘Critical vehicles’. The points made through this chapter lens are distributed under these two main headings, as well as their subheadings, but numbered continuously. The other lenses in this summary follow the same format.

a) Insertions into Circuits.

Making insertions:

1. *One Water* was identified as a good site for the *PlayPump*’s insertion into a commodity, consumer circuit, reaching a first world public.
2. The *PlayPump* itself could be seen as an insertion into the development circuit, ‘masquerading’ as an appropriate technology to attract funding.

Types of messages:

3. While presented as ‘awareness-raising’, the *PlayPump* sheds no critical light on the development sector, the variety of approaches in water supply, or on its own failings – its main ‘message’ is to promote itself as a solution.
4. *One Water*’s main message, similarly, is to promote the *PlayPump*, and itself, as a solution to the ‘water crisis’. It doesn’t reveal the negative qualities of the market it is a part of, bottled water, which might exacerbate water problems in the developing world.
5. As such, both the *PlayPump* and *One Water* contribute to the ‘anaesthesia’ or ‘numbness’ of the first world consumer, playing to their complacency rather than implicating or disturbing them.

Redirecting benefits:

6. *One Water* represents itself as diverting benefits from the commercial bottled water market to good causes, to ‘address the imbalance in the world’.
7. Field represents the *PlayPump* in this way too, with their advertising-funded model as a ‘Robin Hood’ exercise, taking from the rich to give to the poor. But our analysis of the *PlayPump*’s advertising model showed that benefits go to other bodies than the user, through these observations:
 - i) Benefit goes to the *PlayPump* project, because of how attractive a new model for Operation and Maintenance is to funders.
 - ii) But because the advertising wasn’t taken up, users suffered both because they had to pump water to the height of commercial billboards, at no benefit, and maintenance budgets must have suffered too.
 - iii) The major funders for the project indicated their awareness that the advertising-funded model could be perceived of as exploitative, by failing to mention its commercial advertising role.
 - iv) Businesses demonstrated, by not buying advertising in poor and remote areas, that they will only advertise if they benefit from it.
 - v) Those that do advertise are likely to benefit from exposure in first world markets too, through ‘the power of cause marketing’, a benefit to advertisers that Field promotes.

Strange play with value:

8. The *PlayPump* immediately diminishes funds in the development circuit four-fold, in comparison to alternatives; and through calculating the loss of impact on the ground, there is a greater than ten-times loss in effectiveness through funding *PlayPumps*.
9. The *PlayPump* was designed to make money from the start, as its material costs are higher; and money must go too to patents, profits for Roundabout Outdoor, and to the other bodies in its removed networks.

10. *loveLife* as a partner to the project, we noted, has the same property as the *PlayPump* in dissipating the value of money put into the system, between donor and target/recipient.

b) Critical vehicles:

Conveying issues:

11. The *PlayPump* is a ‘medium’ that can travel to first world publics, usually through image but also as an object; as a functional object it helps to overcome ‘empathy fatigue’.
12. The *PlayPump*, along with other contemporary design for development objects, could be described as ‘incorporating the problem’ in the general sense that it promotes its abilities according to the scale of the problem.
13. But the *PlayPump* expresses more the ‘solution’ in its form, through its roundabout: symbolizing the gratitude and celebration of its recipients; using positive images rather than controversy to get media attention.

Limits to impact:

14. The *PlayPump* claims high impact on the ground, and asks to ‘go to scale’; its communication to policy makers is to support its distribution, specifying it over alternatives. At the same time it cuts across policies in countries it is installed in. It doesn’t pressure policy makers to address users, or direct the first world public to do so.
15. *One Water*, though, does use ‘the public’ to pressure institutions, though only to further its own markets.

Equipping users:

16. The *PlayPump* does not equip the user to continue their existing practices, but instead introduces an entirely novel form of action, replacing their past practice.
17. While presented as a way for children to express themselves, the *PlayPump* (especially for adults) is a ‘gratitude machine’ that imposes a mode of action which is like play, but because imposed induces more of a ‘grim dance’, an uncomfortable performance from the user.

18. The *PlayPump* is a vehicle for the messages of its producers, for which users are merely props – they cannot use it to express their frustration or disempowerment to audiences, but must conform to its message of ‘play’.

8.6.2 ‘Critical design’ lens

From the perspective of ‘Critical design’, as analysed in Chapter 5, the *PlayPump* was interpreted under two main headings: a) ‘Para-functionality’ and b) ‘Material Tales’.

a) Para-functionality

1. If read as ‘an industrial design as a form of criticism’, the *PlayPump* could be read as critical of existing models for user-led maintenance, a ‘critical design’ intended to represent an alternative to appropriate technology’s main approaches to ‘self-help’ and localism.
2. If imagined as a critical design object presented in a first-world exhibition, the *PlayPump* might be read as an object which satirises the relationship of first world donors and third world recipients of aid, as a faux-cynical ‘gratitude machine’.
3. But because it is presented as a solution, the *PlayPump* makes audiences think the problem is solved, obscuring and distracting attention from the complexities of the problem it is addressing.
4. The *PlayPump* functions as a placebo, a ‘sugar pill’ for first world supporters, who think the problem is being solved through their support.

The Post-optimal object:

5. While it doesn’t make audiences feel bad, the *PlayPump* does put users through an uncomfortable experience because of the mode of interaction it imposes.
6. It could be described as a ‘post-optimal object’ because it makes advances not in the mechanical aspects of water pumps, but in ‘poeticising’ the interaction of users and the pump.
7. But this is an inappropriate context for such poeticisation, as the users did not volunteer for the experience, it is not temporary but long term, and it is part of a daily action needed to access a vital resource.

The gadget:

8. The *PlayPump* could be described as a ‘gadget’, as it evokes wonder with its novelty, multiple functionality and self-evident ‘cleverness’.
9. The *PlayPump* may well have been better classified as a *chindogu* for its ‘unusefulness’: it appears to harness a free energy source, but like other *chindogu*, introducing one apparently bright idea introduced other disabling problems to the system.
10. That it was not recognized as such indicates the distance between viewers in the first world and users in the third world, and the imbalance of power between them: users experience the failure of the technology, while viewers do not, experiencing only its success as image.

b) Material Tales

11. The *PlayPump* combines attributes of a prop inserted into ‘real life’, and a prop used in fictional scenarios depicting utopian futures.
12. Unlike props inserted into real life as critical design, the *PlayPump* is intended for mass-production; and unlike the props used in critical design future scenarios, there is no misgiving in the *PlayPump*’s tableaux.
13. An imaginative reading of the *PlayPump* in the field (leading from Dunne’s reaction to the *Lapdesk*) focused attention on the *PlayPump*’s prioritizing of its billboards at the expense of users; its alien appearance as an indication of the lack of precedent for its use; its desolation because not maintained; and its semblance to a dystopian future of water funded by advertising, now abandoned, because the real-life project did turn out to offer little value to commercial advertisers.
14. The *PlayPump* has somehow evaded these readings in the first world, though critical design work shows that it is possible for audiences to perceive such messages in ‘material tales’.

8.6.3 ‘Antiprograms’ lens

Through the analysis of the APF and the prepaid meter in Chapter 6, the *PlayPump* was interpreted under two headings: a) ‘Programs and antiprograms’ and b) ‘Protest and participation’.

a) Programs and antiprograms

1. The *PlayPump* can be seen as a component in a broader program – to advance the role of private companies in the development sector, who administer services to users for a profit.
2. Through the *PlayPump*, the interaction of users and supporters of the program is minimized.
3. The *PlayPump* as a nonhuman object, which offers play no matter the needs of the user, is facile, child-like, or a clown – as such its behaviour is frequently ‘inappropriate’.
4. The roundabout is an iconic object for viewers, having a self-serving logic that persuades them play, and therefore pleasure, must characterize the user’s interaction with the pump.
5. The *PlayPump* prescribes a passive, disempowered user, taking on duties such as maintenance for itself.
6. The *PlayPump* is infantilising, both in not giving responsibilities to the user, and in literally demanding that its users be children, distorting the bodies of adults who use it.
7. It diminishes the ethics, values and duties of communities that use it, who neglect the needs of the sick, elderly, disabled and pregnant; it fosters social tension and lessens generosity.
8. While there is a need for antiprograms to the *PlayPump*, and replacing *PlayPumps* with handpumps would do some good, whatever replaces it would need a program around it to support it.
9. With limits to user-led antiprograms to the pump, users could look to protest to motivate against it.

b) Protest and participation

10. The *PlayPump* used incentives (to local contractors), and exploitation of need (replacing not repairing pumps) to advance the program.
11. The managers of the *PlayPump* claim to have engaged in consultation, but users claim not to have been properly consulted; there are some probable reasons for this discrepancy:
 - i) The project, when showed to users or administrators, was misrepresented to them, so it was not informed consent.
 - ii) There is a power imbalance between first world donors and third world recipients which makes real consent hard to achieve.
 - iii) The *PlayPump* project relied too much on upper levels of representation, such as governments.
12. The *PlayPump* has an ambiguous relationship to structures of authority, relying too heavily on them and privileging them over users, but also overriding the policies of local authorities, and ceding control to users where they need structures of administration.
13. Field's candid account of the history of the *PlayPump's* advancement shows that it was pushed forward through high-level connections who lacked relevant experience in the sector, but pressured governments to accept the project with little proof of its worth on the ground.
14. There is a need for users to protest the system. Protesting to their governments was successful for some users; in Mozambique some communities successfully petitioned for the return of their handpumps. But there is little possibility for their protests to target first world audiences and donors who support the project. A possible contribution would be to create such routes.

The observations from this chapter will be married to what was learnt about the *PlayPump's* performance and fluidity in Chapter 7, and woven with our first observations in Chapter 2 about the *PlayPump's* high visibility, claims of high impact, and the ways it is represented, to produce a conclusive set of arguments and observations about the *PlayPump*, in Chapter 9.

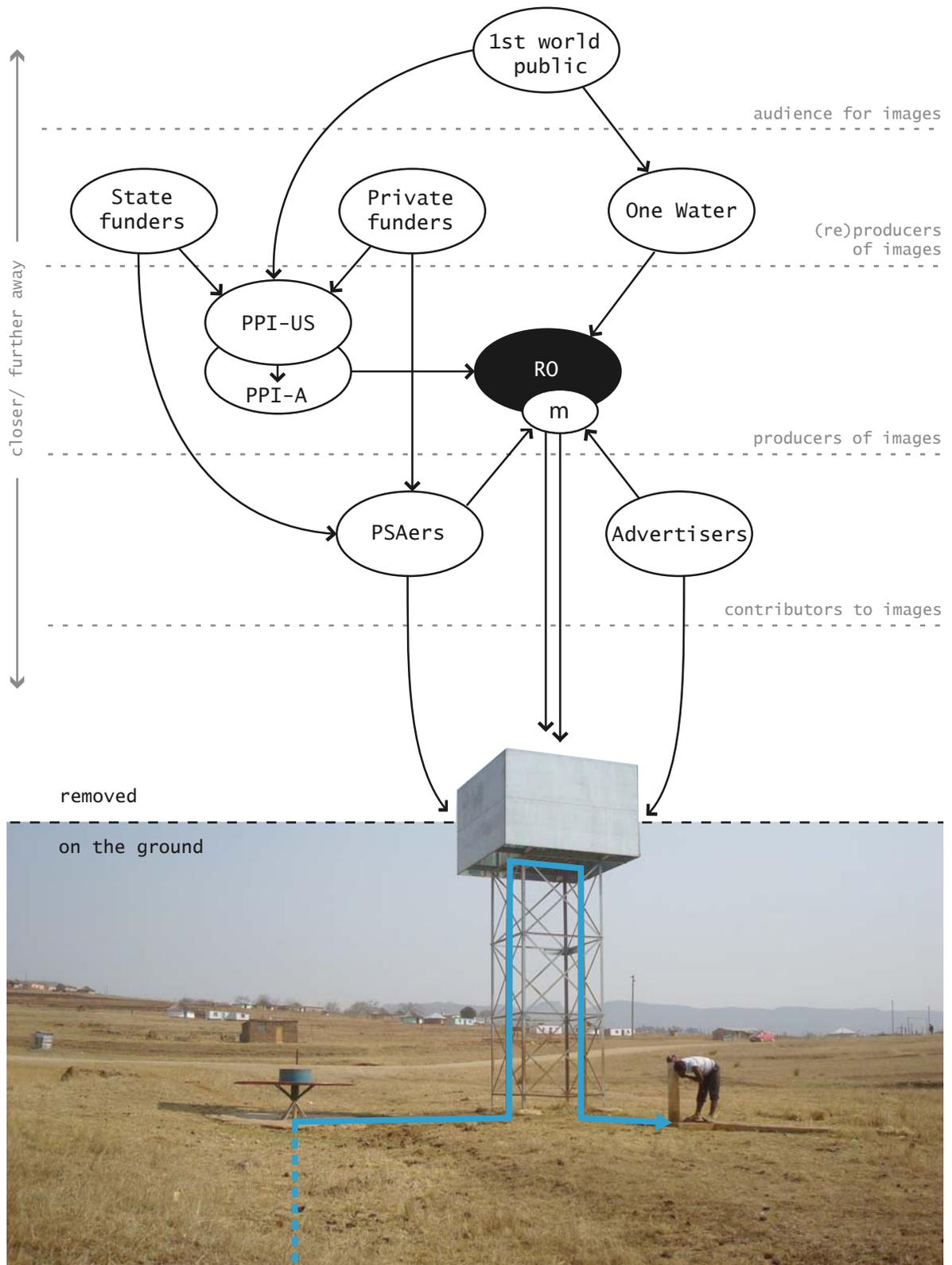


Fig 9.1: How images of the *PlayPump* are propagated, indicating how much intervenes between audiences in the first world and the *PlayPump* on the ground.

Chapter 9

Conclusion

“These stories, they go far beyond mechanics; far more than steel bits and bolts”.

Peter Morgan, interviewed in Harare, Zimbabwe in September 2010

9.1 Introduction

This chapter concludes the thesis. The *PlayPump* is first re-presented, in section 9.2 below, drawing on the extensive analyses of the project in Chapter 7 and 8, combined with the earlier account of the *PlayPump* in Chapter 2, to produce a set of unified observations about how and why it works, and fails, the way it does. Taking some liberty after the detailed structure of the previous two chapters, this section is not subdivided, though the main points it makes are summarised at the end of the section.

In the next section, 9.3, these conclusions about the *PlayPump* are used to reflect on design for development, through the framework first introduced in Chapter 2: Design for development – its high visibility, its claims of high impact, its symbolic and communicative aspects, and (especially) its claims to be ‘a revolution in design’.

The range of work investigated in the thesis, taking place across many arenas, is then discussed in the section ‘Objects in development’. What can we say about the shared interest, across different disciplines, in functional objects as vehicles for discussion and activism? What have we learnt from looking widely, and how might we apply lessons from one area of production to another? If the *PlayPump*’s tragedy is partly a result of an error in its categorisation, how could we be more careful in the future to recognise into what category a functional object which communicates should fall? And might objects which interrogate be at least as useful to ‘development’ as new objects with supposed instrumental value?

Finally, the contributions made by the thesis are recorded, and possibilities for future work are suggested. The chapter is summarised in conclusion.

9.2 The *PlayPump*

One of the first things we might notice, looking across the perspectives on the *PlayPump* established in Chapters 7 and 8, is the way the *PlayPump* inverts (or at the least relocates) several of the modes of operating observed in other arenas. In evaluating the fluidity of the *PlayPump*, in Chapter 7, we saw that where the fluidity of the Zimbabwe Bush Pump is in the mechanical object, the *PlayPump*'s fluidity is in the removed parts of the system – its networks for administration, funding and campaigns. This interpretation was verified twice: in its fluidity over time, and in its ability to keep on working in the face of breakdown. The *PlayPump* on the ground, in contrast, lacks these attributes. And whereas a successful Zimbabwe Bush Pump, de Laet and Mol write, seduces the community around it, the *PlayPump* seduces audiences and funders, having no need to seduce the community, upon whom its success does not rely.

Similar inversions were noted through the lens of critical design: where *Placebo project* offered illusory comfort to some of its users, placating their fears about electromagnetic radiation, the *PlayPump* (either through its own publicity or through *One Water*) offers illusory comfort to the first world public that supports it, assuaging their conscience about the poor in the developing world. Where Dunne & Raby 'poeticise' the interaction between users and the 'post-optimal' objects they design, this is for the 'complicated pleasure' of the users who volunteer for the experience, whom Dunne & Raby imagine renting such objects as they would a book or a movie. The *PlayPump* as a post-optimal water pump poeticizes the interaction of users with it, but this is not a voluntary, temporary experience, and the simple (rather than complicated) pleasure engendered by this interaction is for audiences to the project, not users.

In comparison to the way 'critical vehicles' are designed in interventionist art, as argued in the previous chapter, the *PlayPump* is a vehicle not for the user's expression, but for the project's producers and supporters. The *PlayPump* makes its users conform only to the message *it* wants to send – that work is now play, no matter the actual intent of the user. Whereas critical vehicles offer a mouthpiece to the user, the *PlayPump* silences them: it is a 'gratitude machine', which demands that users celebrate it. While an interventionist art object might insert itself into circuits to redirect benefits to the marginalized, the *PlayPump* disguises itself as an element of a circuit to draw value towards itself, and redirects benefits to the already powerful. And the messages written onto commodity objects that it puts into public circulation do not reveal aspects of the circuit, but conceal them; their purpose is not to draw attention to the nature of the circuit, but to increase their share of it.

We observed, through the lens of ‘antiprograms’, further inversions: the ambiguous attitude the *PlayPump* exhibits to structured participation, for example. It relies too heavily on top levels of representation, securing agreements from governments, rather than from users; yet when it comes to water management around the pump, for which it is well-acknowledged that users require structured forms of participation, the *PlayPump* derides such structures and ‘leaves it up to the users’. This could be seen as an inversion of existing practices in development, which are to consult users directly on their technology choice, and to help them set up structures to manage their use of the technology.

In tracking these inversions and relocations of function, we can observe a pattern: what the other objects and actors in this thesis aim to do for users, the *PlayPump* does for itself, its partners, and its audience – who are also its funders. The removed networks of the *PlayPump* have been fluid over time in response to opportunities for increased funding and exposure. This benefits the producers of the project, who profit from its expansion. Users do not benefit from its expansion, because the technology does not work as well as alternatives. Its removed networks are fluid in response to breakdown, able to repair themselves and replace broken parts in order to keep on working, because the ‘users’ of this network – Roundabout Outdoor – have the ability to modify it. They retain this power because it affects their own interests.

The users of the *PlayPump* on the ground are not able to modify the pump or fix it when it breaks; Roundabout Outdoor keeps this power too to itself, as managing maintenance is one of the sources of its profit – an example of the negative influence profit for businesses outside the user community can have on development projects. Users are left waiting with broken-down pumps as a result. That the advertising-funded maintenance system for the pump is a ‘closed loop’ does not benefit the users, but it does benefit the removed networks of the *PlayPump*, limiting how much funding can be drawn down to the ground from the removed parts. A kind of ‘closed loop’ more likely to benefit users would be if there was local management of billboard-rental and maintenance, as UNICEF suggested – but this would not be in Roundabout Outdoor’s interests. Where the parts of the *PlayPump* system are well designed, it is to benefit its makers and partners, not users.

Where else the *PlayPump* is well designed is in the image it presents. Chapter 2 described how successful the *PlayPump* has been at exciting the imagination of first world audiences, both amongst the general public and with funding bodies. One of the key components to this image is the apparent disconnection of children playing from water pumping; the work the *PlayPump* accomplishes must seem like a magical byproduct of children’s play. The *PlayPump*

on the ground has been carefully designed to further this image. Chapter 7 noted how well the pump mechanism is hidden within the roundabout, so that it is near invisible, the roundabout looking barely different to an ordinary piece of playground equipment. The concrete base around the roundabout is sealed, giving no hint of the pipes running beneath it; and the pipes connecting roundabout to water tower and water tower to faucet are likewise invisible, buried beneath the ground. The water tank, even, is hidden behind the billboards. The *PlayPump* on the ground is in this way very well designed, successfully concealing the connections between the parts of the installation, each of which stands separate: roundabout; faucet; and billboards.

But hiding the pump so successfully within the confined space of the roundabout had the consequence of drastically shortening the pump stroke, making it pump water much slower than equivalent handpumps. The confined mechanism also makes the roundabout hard to operate – it may look like a conventional roundabout, inviting the viewer to imagine it spinning freely, but the user has to overcome the steep curve of the internal mechanism at every turn. Sealing the connection of riser pipe to borehole seamlessly beneath the concrete surround necessitates breaking up the concrete each time a repair to these parts is necessary; and the concrete needs a week to dry after each intervention. Putting the faucet at a distance from the roundabout increases the amount of work needed to pump water to where it can be collected. This work is increased too by having to pump the water to the raised tank, which almost never has a reserve of water, because of the retarded performance of the pump.

Users are disadvantaged by the same features of the *PlayPump* that make it a successful image for audiences. The fluidity in its working order – its willingness to compromise some features while achieving other – is towards maintaining its image: not its efficiency for users. The needs of audiences are prioritized over the needs of users. That isn't quite right: the 'need' is not exactly the audience's; it is not a need audiences knew they had. It would be fairer to say that these design features answer the need of the *PlayPump's* producers to have audiences compelled by it. But first world audiences 'selected for' these features, and selected for the *PlayPump's* success, by being compelled by it; selected as in the phrase 'natural selection' to describe how plants and animals evolve. The audience are a part of the environment, which selects the *PlayPump* for advancement (or propagation, to continue the analogy) because of how successfully it excites their imagination, inspiring them to support the project. In this way the response of first world audiences also 'froze' the *PlayPump* as an object on the ground, reducing the possibility that it could be fluid in response to the needs of users – its image is too important to its success as a fund-raiser to risk modifying.

The *PlayPump* as ‘innovative’, which has helped it win awards, is also part of its attractive power to observers. But the nature of its innovation too targets audiences rather than users. The addition of roundabout and billboards to a standard pump, which made it stand out from other pumps, hampers its performance. But these additions present a spectacular image to audiences, seduced by the *PlayPump*’s novelty. Comparing PlayPumps International’s diagram showing how the *PlayPump* works, in fig 2.7 (the only diagram ever made public to describe the workings of the system) and Erpf’s diagram describing the Zimbabwe Bush Pump in fig 3.5, we can see the difference in the scale of innovation suggested. In comparison to the *PlayPump* the innovations of the Zimbabwe Bush Pump are subtle and internal, by which it slowly advances over time – but at benefit to its users. The *PlayPump*’s depiction of innovation is one of sudden, large-scale additions, a broad brush-strokes, spectacular innovation: apparently ingenious to observers, but of little use on the ground.

The prioritizing of the image of the *PlayPump* presented to audiences is a factor of the unequal power relationships within the systems in which the *PlayPump* operates, connecting first world and developing world. The *PlayPump* was more strongly selected for by its ability to excite first world audiences, than selected against by its failure for users. Users have little power to resist the installation of *PlayPumps*, as decisions to install them are made at transnational and local governmental levels, and little power to disseminate more realistic images of the *PlayPump* to dissuade supporters of the project. But first world audiences have the power to advance the project through their support, and so its design targets them rather than users.

The separation between audiences to the *PlayPump* and its users in the field allows these representations of the project to go unchallenged. There is very little way for users of the *PlayPump* on the ground to transmit their own messages to audiences: the *PlayPump* is not designed for them to do so. As a for-profit enterprise with one product to sell, the only messages that the *PlayPump*’s producers are interested in disseminating are ones that increase the expansion of the market for their product. For users of the pump, their geographical separation from audiences, and a lack of access to networks for communication and distribution of messages, means the misleading images of the *PlayPump* disseminated by its producers and partners are all that first world audiences are likely to see (an interventionist art project could be in devising ways for them to do so).

Looking back at the diagram of the *PlayPump* system at the start of Chapter 8, fig 8.1 (not the modified version that opens this chapter, which we will address shortly) we could imagine the dashed line that separates the *PlayPump* on the ground, from the *PlayPump* removed, as something like a ‘screen’ on which images of the *PlayPump* are projected by its producers and

partners. The first world audiences up at the top of the diagram, looking down at the *PlayPump* on the ground, see instead the idealized images projected there by Roundabout Outdoor and PlayPumps International, *One Water*, and the state and private bodies who advertise on the *PlayPump*'s billboards. They control representations of the *PlayPump* to audiences.

The state and private bodies which advertise on the *PlayPump*'s billboards, and then produce images of *PlayPumps* that include these advertisements, partake in the shared benefits Field promotes for the system, through which “we can make a really big organisation look fantastically well by being associated with PlayPumps” (London 2007). Advertising on the billboards, and then reproducing images of the billboards that associate their organisation with the *PlayPump*, offers a way to reach distant audiences as well as the audiences local to the *PlayPump*. This process also offers, in some instances, a crude example of how malleable images of the *PlayPump* are, and how they might be manipulated en route to audiences.



Fig 9.2: Same photo, different billboards (left to right): billboards for loveLife, from PlayPumps International; One, on the website for vee3, a UK organisation raising funds for One; Department of Health, South Africa, in Reader's Digest's '60 Best' publication.

During the course of my research for this thesis, I came across several versions of the same photographs appearing in different contexts, each altered to change the images on the billboards of the *PlayPump*, as can be seen in fig 9.2 and 9.3 (on the next page) below. This shows that not only are the billboards on the *PlayPump* not intended just for users of the pump, but also that advertisers do not even have to place their images on the billboard of a particular *PlayPump* on the ground – it can be added later to photographs for first world audiences. This emphasises the lack of power that the *PlayPump*'s users on the ground have over its image. It demonstrates control taken far out of their hands, reinforcing the extent to

which the *PlayPump* project exists as a malleable image for the benefit of bodies, or the gratification of audiences, removed from the *PlayPump* on the ground.



Fig 9.3: Same photo, different billboards (left to right): billboards for *loveLife*, on a pamphlet produced by Roundabout Outdoor, DWAF and *loveLife*; Sunlight soap, from MediaClubSouthAfrica, credited to PlayPumps International; One Water, from One's website.

Seeing how the *PlayPump*'s billboards can be displayed to distant audiences, whether real or faked, might give us cause to reassess the position of the line that divides the *PlayPump* on the ground from its removed networks: perhaps the billboards should be represented as sitting on this line, visible to both people on the ground, and distant bodies. The blank billboards on most *PlayPump* installations in the field could serve as a metaphor for the 'blank canvas' they represent to distant bodies, which can freely place their own images on them in reproduction. Fig 9.1, at the start of this chapter, makes this change to the diagram, and adds more information to it emphasizing how many bodies produce and reproduce images between the *PlayPump* in the field and first world audiences.

In investigating the *PlayPump*'s 'para-functionality' through the lens of critical design, in the previous chapter, we identified it as having the features of a gadget or *chindogu*. The fact that the *PlayPump* is not seen as a *chindogu* in the first world, when it shares some of the same features, was proposed as a feature of the power imbalance between first world audiences, who do not experience the failure of the technology, and third world users, who do. It is also a sign of another type of separation between first world audiences and the developing world contexts proposed for the use of such technologies: the developing world as a space into which first world audiences can project their fantasies, imagining technologies as 'appropriate' there in ways they would be likely to think ludicrous or ethically compromised in the first world.

Dunne's identification of the *Lapdesk* project as a seeming parody of a critical design project, as recorded in the previous chapter, and the horrified reactions he imagines might greet it in the first world, is in contrast to the fact that the project is instead celebrated, both in South Africa and in certain international forums. *Lapdesk* founder Shane Immelman won a 'Proudly South African New Business of the Year' award in 2005, and the project has the patronage of South African Nobel Prize winner Archbishop Desmond Tutu. It is supported by the US 'social enterprise' company Enterprise, and the *Lapdesk* story is "used in the orientation curriculum for first year Harvard Business School students" (NextBillion.net 2008). A proposal that might seem like a joke or a parody, especially if imagined in a first world setting, is instead hailed as an ingenious solution for developing world problems.

We might ask why something that would be likely to be resisted in the first world, where it might appear to be a type of futuristic, dystopian vision, is embraced as a socially beneficial project in the developing world. That first world audiences abandon skepticism when confronted with design for the developing world must be contributed to by the impression of overwhelming need created for this space: the needs of people for basic necessities such as water are portrayed as so acute that ethical compromises which would arouse suspicion in the first world, such as accepting advertising as a condition of assistance, are assumed to be justified in the developing world. This impression of urgency is useful to projects such as the *Lapdesk* and the *PlayPump*, and Field has contributed to this image of the developing world, to his project's advantage.

A reason Field gives for the lack of evaluation of the *PlayPump*, for example, is this urgency. "I get asked all the time, "Where's your research and evaluation about what you've done?"" he told an interviewer, "and that's a good question. But when... you see people are dying of thirst, I don't think research and evaluation is top of my list" (London 2007). This has also been useful for evading minimum standards for water supply to users: "I'm into basic water. I'm not into people bathing, washing clothes, and washing the car. I'm into people drinking water and staying alive, that's it" (Gingerich 2008).

Overwhelming urgency is a bogus reason for both Field's lack of evaluation of the technology, and the *PlayPump*'s failure to meet standards. For one thing, these are long-standing problems, on which people have been working for decades; producers of successful appropriate technologies operating in the same contexts, such as Morgan, take the time to evaluate their systems before releasing them, because they know the negative effects of rolling out a project prematurely are worse than the effect of delaying their release. The *PlayPump* has proved this case: developing world users are worse off now with *PlayPumps* than they were with

handpumps, because the project was not properly evaluated or accurately portrayed – and because it does not aim to meet the standards which other technologies adhere to.

Another way in which the level of urgency, calling for the *PlayPump*'s intervention, is exaggerated, is that the *PlayPump*, as recounted in Chapter 7, does not 'bring water where there was none before', but replaces other water sources: almost half of the handpumps which the *PlayPump* replaced in Mozambique were working or only required minor repairs. One of the things that struck me in touring *PlayPump* installations in South Africa was how many other sources of water there were right next to, or in the vicinity of *PlayPumps*. I saw children operating handpumps within sight of *PlayPumps*, and I saw faucets that had clearly been used recently also within sight of *PlayPump* installations. Schools with *PlayPumps* frequently already had water tanks and other water points. People were clearly not 'dying of thirst', as Field portrays it, for the lack of a *PlayPump*.

But Field used this impression of emergency to gain the support of funders such as the Case Foundation. When Steve and Jean Case visited South Africa and wanted to see a *PlayPump* in action, they made the "big mistake", as Field put it, of spending a couple of hours in the car with him, a veteran advertising executive, during which time he was able to use his persuasive skills to sell them the project: "I do not have a problem with talking for that amount of time" (Gingerich 2008).

We drove out to a site and I took them to a rural community where kids are literally burned to pieces, little girls have been prostituting themselves to try to get a loaf of bread, crippled kids are prevalent. It's a pretty rough place. Jean just sort of freaked and they got on a plane and went back home. I really didn't think that I had done that well when they were here. Then I received a phone call from the foundation's Senior VP saying, "Jean just loved the PlayPump®, loved the company, loved you, just loved it all and just wants to make a difference. So we would like to donate, if you would present this formally" (Gingerich 2008).

This personal encounter with developing world poverty clearly made a great impression on the Cases: they were later to describe their selection of the *PlayPump* as a result of this trip to South Africa, where they "witnessed the water crisis firsthand" (Case Foundation n.d.). How representative this location was of *PlayPump* installations in general, is doubtful; but in any case we know that the *PlayPump* is not capable of solving the problems he showed them. Shocking the Cases by showing them very poor people, while exaggerating the capabilities of the

PlayPump, compelled them to back Field's project. While creating this impression of urgency has been useful to the project, it has been detrimental to satisfying the needs of developing world users, as audiences (including major funders like the Cases) have been persuaded to support an inferior technology in the belief that the situation is so urgent it demands this otherwise fanciful solution.

The Case's experience illustrates another feature of the barrier or screen between first world audiences and the developing world – that it is not easily pierced, even when entering the developing world bodily. The discussion so far in this chapter has suggested that part of the reason audiences can maintain such a distorted vision of the *PlayPump*'s use is their separation from users, by the 'screen' that divides them and on which images are projected, and this does largely hold true. But strangely enough, this distorted image of the *PlayPump* can persist even when people from the first world come and see individual *PlayPumps* with their own eyes, though we know this image to be unrepresentative of the way *PlayPumps* are used most of the time. Both Erpf in Mozambique and Owen in Malawi write about their experience of this phenomenon. Erpf, first:

In most schools visited, children were not always moving the play wheel – they often enjoyed the PlayPump as a gathering place, just sitting on it and chatting.

However, as soon as the evaluation team (foreigners) walked towards the PlayPump, the children rushed to the pump (like they have been told), showing their ability to rotate the play wheel at an enormous speed. The children pushing the wheel with such a high speed could only keep up this pace for a few minutes before being exhausted (Obiols & Erpf 2008, p.24).

Erpf's report here highlights, in parentheses, the relevant parts of this phenomenon: the evaluation team are 'foreigners', and the children play 'like they have been told'. They spin the wheel at great speed for a short time, and then stop exhausted after a few minutes. Clearly, this is not a realistic depiction of the way the pump is used, though it happens right before the eyes of the observer. Owen describes the difficulty he had in Malawi in getting a photograph of adult women operating the roundabout by hand, though he knew from past observation that this was the way the *PlayPump*'s roundabout was mostly used.

Each time I've visited a Playpump, I've always found the same scene: a group of women and children struggling to spin it by hand so they can draw water. I've never found anyone playing on it. But, as soon as the foreigner with a camera comes out (aka me), kids get excited. And when they get excited, they

start playing. Within 5 minutes, the thing looks like a crazy success. Kids are piling on top of each other to spin around on the wheel, and women can fill their buckets without having to work (although I'll note that the buckets still fill slowly) (Owen 2009c).



Fig 9.4: Children reacting to the presence of a foreigner with a camera in Malawi, from Owen's blog.

Owen took a series of photographs to illustrate the phenomenon. When he arrived at the site pictured in fig 9.4 above, there were a few women operating the roundabout by hand, with children sitting on the ground nearby. After he started taking photographs of the *PlayPump*, children started “running from the woodworks. An azungu (foreigner) with a camera must be accommodated. Only a huge crowd of children will suffice” (ibid). The left-hand image shows the influx of children at its height, piling onto the roundabout, while women relocated to the tap to take advantage of their input. Owen took the right-hand image later, after the excitement had dispersed: in the background, adult women can be seen once more pushing the *PlayPump*'s roundabout around by hand (yellow circle added).

Owen and Erpf's very similar experiences show that the distorted view of the *PlayPump* supplied by its makers and partners to audiences in the first world might be replicated right on the site of an individual *PlayPump*, due to the desire of locals, children especially, to put on a show for a foreign visitor. Owen warns that:

If you show up in a community with a Playpump, it will look like a success. Kids will play. Water will flow. But all of this is likely only happening because you are there. And if you can't ask the right questions, or if you are travelling with a guide who has a vested interest in the technology (e.g. an NGO worker who installs Playpumps), then you will never know the difference. Same goes if you only watch the promotional videos on the Playpump website (2009c).

The ‘screen’ that we have suggested divides the *PlayPump* on the ground from audiences is not so easily pierced, and its effects may persist even to the object itself, when seen by a first world audience that does not enquire too critically into the ‘real fiction’ unfolding before them. In these instances, the screen that divides our diagram acts perhaps more like a flexible membrane, which accommodates the movement of the viewer, maintaining its integrity even when they imagine they have crossed it. The larger systems at work which divide first world viewers and developing world users, with their enormous imbalances of power, are not so easily surmounted by individual acts.

This is all the more reason why careful analysis and evaluation of the *PlayPump* needed to be conducted by disinterested parties over a period of time, not in a situation where villagers are expected to show gratitude to a donor, or to otherwise ‘celebrate’ the *PlayPump* for an audience; or else the presence of a foreigner will conjure up the images that the outsider wishes to see, as the users perform to fulfil the observer’s desires.

Such encounters demonstrate the danger of allowing the emotional reactions and perceptions of first world audiences to profoundly influence the direction of development work. The way in which the Cases were persuaded to support the *PlayPump* illustrates the especial risks in allowing the impressions of highly influential individuals, with little knowledge of the water sector, to launch a multi-million dollar programme to propagate a new technology in the developing world, and in the process override the national standards of local governments, saddling users with an inferior technology which they have little power to resist.

This section started by noting a number of ways in which the *PlayPump* inverts the modes of other functional, communicative objects described in this thesis. These inversions all tended to favour the *PlayPump*’s makers and supporters – and audiences to the project. The project is ‘well-designed’ when it comes to advancing the interests of its makers and in creating a compelling image for audiences, but not for users. That the image it presents to audiences is prioritised is in part a feature of the power relationships of first world observers and developing world users – its success with these audiences selected for the *PlayPump*’s advancement over its failure for users, and the success of this image had the effect of ‘freezing’ the *PlayPump* as an object on the ground. Maintaining this distorted image of the *PlayPump*’s performance amongst audiences in the first world is enabled by a type of ‘screen’ between them and the real *PlayPump* in the field, onto which the *PlayPump*’s producers and partners project idealised depictions of its use.

This screen also enables the projection of fantasies about the developing world, particularly the impression of overwhelming need and the urgency required to help people there. This fantasy of emergency is useful to projects such as the *PlayPump*: it allowed Field to justify the lack of evaluation and minimum standards for the system. It also served as a prop in his efforts to attract funding for the project, shocking first world donors into action without proper inspection. As a metaphor, the screen dividing first world audiences and developing world contexts might be better imagined as a flexible membrane, because it stretches to accommodate first world visitors to the developing world, allowing these fantasies to persist even there. The difficulty in piercing this barrier is a strong motivation against relying on the emotional reactions of first world audiences, seduced by attractive projects, and frightened by developing world poverty, to determine the direction of development.

The arguments and observations developed in this section are carried forward into a reflection on the broader field of design for development, framed as the causes and consequences of the *PlayPump*'s high public profile, its wide-ranging claims of impact, and the compelling ways it is represented to audiences as image – the original characteristics we defined for current trends in design for development.

9.3 Reflecting on design for development

This section reflects on design for development, in the light of what we have learned about the *PlayPump*. The *PlayPump* was described in Chapter 2 as an example of contemporary design for development, regarded throughout most of its (short) history as an icon of the field. It was discussed through the broad characteristics observed in design for development: highly visible, making claims of high impact, and valued for its symbolic and communicative aspects. Here design for development is revisited and, along with what we now know about the *PlayPump*, discussed under these same categories below. The implications of this discussion, for how we might further analyse or influence design for development, along with a note on models for 'sustainable business' in development, close this section under the heading 'Conclusions'.

9.3.1 High visibility

In Chapter 2, a number of high-profile public forums were described, to demonstrate the high visibility of design for development: in design institutions such as the Cooper-Hewitt and the New York MoMA, in competitions such as the INDEX: Awards, in the *TED* conference, and in the popular forums of television and retail, via *Dragon's Den* and IKEA. The thesis documented this visibility, Chapter 2 proposed, because the level of first world public and

institutional support for design for development is high, making a critical examination of the field urgent. It also, as argued there, makes it likely that this first world interest may motivate the production of objects of this type, or select for projects that are particularly successful in exciting this audience.

The *PlayPump* was introduced as an example of a design for development object that has had a particularly high public profile – and it does prove the proposition that projects which are particularly successful at exciting first world audiences will be advanced. The *PlayPump*'s high visibility is enabled by the seductive propositions it presents to audiences: of work achieved through children's play, of innovation and creativity solving an enormous social issue. The high public profile it has achieved through the interest of the press and the public, as a result, has accelerated the expansion of the project, despite its lack of success on the ground. In this way, as argued earlier in this chapter, the *PlayPump* has been 'selected for' by first world public interest in the project, rather than for its service to users.

In the face of the approval for the project from first world audiences, even major organizations have overlooked the lack of evidence for the value of the system on the ground, taking public approval as self-evident proof of its benefit. The *PlayPump*'s proven ability to appeal to first world audiences no doubt makes associating with it attractive to other bodies, from states to charities and businesses: a benefit that Field advertises to potential partners to the project. The history of the *PlayPump* project is one of snowballing interest in the project, with powerful partners offering their support to the project the more publicity it achieves. These powerful partners have helped to advance the project over the standards of local governments, and the negative experiences of users of the system.

The cost of the high visibility of the project has been to bypass experts and authorities on development through appealing on a broad, emotional level to the general public and to non-expert organisations in the first world. Organisations such as the Kaiser Family Foundation and the Case Foundation's expertise is not so much in development as in high-level fundraising and campaigning, in the arts of high visibility. The *PlayPump* is perfectly suited to them, though to the detriment of users.

Because many contemporary objects designed for use in the developing world rely on first world audiences to fund them, the requirement to sustain interest from these first world audiences becomes an important function of the object. The cost of attaining high visibility threatens to supersede the needs of the intended users of such objects in the developing

world. It should cause us to examine the costs, as well as the benefits, of involving first world audiences in development on the terms that they are currently.

As it is, the price of achieving high visibility with first world audiences could well be the complexity of the messages it offers them, especially with the low risk approach that the mass media takes in communicating issues to the public. Writing about disaster relief, as an example of the first world designing for developing world need, James Murlis writes that “the press has, of necessity, a very simplified view of disaster and needs to hold the interest of readers, and so it gives emphasis to the dramatic, rather than to the commonplace acts which are sensible but uninteresting” (1977, p.54). The Zimbabwe Bush Pump, along with other everyday appropriate technologies, may be little known to general audiences in the first world, but are very effective for developing world users. The true allies of users in the developing world so far have been not the general public in the first world, but committed experts in appropriate technology who work on the ground in response to needs there.

This is not to argue that it is impossible to convey the complexity of developing world issues to first world audiences, but to note that it has been a less risky proposition to supply them with easily-assimilated images. A challenge, and a possibility for further work resulting from this thesis, is to devise ways to communicate the more complex issues clearly to the public.

9.3.2 Claims of high impact

The notion that simple, small-scale designed objects can have a high impact on large-scale problems in the developing world, as Chapter 2 noted, is promoted by producers of design for development objects and conveyed largely uncritically to the public by design institutions and the press. Projects that were as yet untested, or only tested in limited contexts, such as the *Q-drum* or the *ROSS*, were associated with spectacular statistics of lack, and celebrated for their supposed ability to redress them. Making claims for impact based mainly on the scale of the problems a design addresses, rather than its particular capabilities, seems to be typical of this arena.

The *PlayPump* is no exception, making such claims as to supply all of South Africa’s water needs by 2003 – this didn’t happen – or to supply 10 million people across Africa with water by 2010 – that didn’t happen either. Projects in the sector seem to make such claims with impunity, suggesting that they can help millions if not billions of people, only given the right backing. There seems to be an attitude in the design for development sector that making such claims is all in the service of advancing the cause, of directing attention towards the needs of

the developing world and efforts to address them. Optimism and positivity is seen as valuable, and aiming big, being ambitious, as Field is, seems to be celebrated.

But while the *PlayPump*'s claims of high impact secured the project awards and funding, they had severely negative consequences for developing world users. Because funders believed these claims, without evidence, it led to the rollout of an inferior technology, with more able technologies supplanted by the *PlayPump*. The project was propagated at a scale out of proportion to its capabilities, as its high claims indicated it could be a 'solution' to the problem of water provision.

These claims are for the large-scale impact of the overall project. The other claims the *PlayPump* made were its more specific or detailed claims for the performance of the technology on the ground, and it is here that the rot really starts. Its claims for its performance – how fast it could pump water, and what size community it could supply – elevated it above competing technologies, such as handpumps. It also offered a new 'sustainable' model for maintenance, claiming to solve one of the major issues that hampers technology designed for the developing world. The range of other benefits claimed for the system, such as addressing gender inequality, providing play facilities, or working against HIV/AIDS, added to its ability to stand out above the competition.

At the level of the individual installation, because the capabilities of the pump, and the number of people it could supply with water, were exaggerated, it is placed in communities far too large for it to supply. Users are so denied an adequate supply of water. It was always a risky proposition that companies would be interested in advertising to poor audiences, and it made the project vulnerable to the global economic climate. But the risk of this proposition was borne largely by the users of the pump: the height of its billboards, containing the tank, are a permanent hindrance to pumping water. This risk was also carried by funders: the billboard tower contributes to the higher cost of the system.

The knock-on effects claimed for the *PlayPump*, such as decreasing the amount of time women and children spend collecting water, enabling children to spend more time in school and mothers with their families, were prevented by the first, basic flaws in the water pump. The acceptance by funders and award committees that impacts can be claimed in this way demonstrates a fatal flaw in such thinking: if one thing doesn't work the way it is supposed to, everything else falls down. But claiming this multiple range of impacts allowed the project to advance.

In all these ways, the real-world impact of making high claims without evidence is shown. It shows the impact of ‘words on steel’, to recapture some of the observations about ‘delegation to objects’ from Chapter 6: the claims made by the *PlayPump*’s producers quite literally caused the technology to fail. If they had claimed it served much fewer people, then it would have been placed under much less pressure, and could have filled the users’ demands. But without making these exaggerated claims, the project would never have been backed in the first place, as it is so much more expensive and so much less efficient than comparative technologies.

There is a cost to exaggerating benefits, both to the user and to the long-term success of a project. Unfortunately, the cost to projects of making such claims is often low. *loveLife*, for example, as noted in the previous chapter, may have lost its funding from Global Fund, but it continues to be funded by other organisations. The *PlayPump* may have been dropped by PlayPumps International, for reasons that are not entirely clear, but they are still supported by *One Water* and many hundreds of thousands of individuals in the first world. The project has not yet run its course.

The receptive environment created around design for development in the first world contributed to the *PlayPump*’s producers and partners exaggerating its benefits. Making huge claims without evidence is typical of the arena, as we have seen from other examples, and curators and the press are happy to collude in this. In an environment like this, where making exaggerated claims seems to be expected of any new design, there is little disincentive to stop doing so. But the case of the *PlayPump* demonstrates that this is not a harmless act, another component of the advocacy necessary to gather people around the cause of supporting design intervention in the developing world.

The uncritical reception of design for development projects creates harm for the people it is intended to help, and it is a worrying sign of the relative powerlessness of developing world users that the cost they bear for these claims has little impact on the overall system of design. To really ally themselves with the needs of the poor in the developing world, design institutions and the press need to develop ways of being more critical and complex in their evaluation and depiction of work in this field, realizing the costs to their uncriticality.

9.3.3 Symbolic and communicative aspects

As described in Chapter 2, design for development objects appear to arouse interest in ways that go beyond their efficacy in the field. That chapter directed our attention to the use of design for development objects as props for advocacy, framed for their ability to ‘tell stories’

about the problems of the developing world and the possibility of solving them through the design of innovative objects. Each of the objects selected for exhibition on *Design for the Other 90%*, for example, was described as opening “a window into a unique story”, the exhibition curator wrote, which “emphasize the variety of means by which designers around the world have attacked the ongoing bane of global poverty” (Smith, C 2007, p.13). Chapter 2 noted a concern that, in selecting and presenting design for development objects as symbolic and storytelling, institutions, the press, and the public might advance objects which are particularly effective in this way over less ‘communicative’ objects, or over objects which suggest different types of narratives. The *PlayPump*, it was proposed, is an example of just such an object.

The work in this thesis has demonstrated this case. The *PlayPump*’s powerful abilities to communicate as image have been essential to the project’s success. The ways in which the *PlayPump* is read by and represented to audiences include its presence as a character in a positive narrative, as an innovative object, as a literalisation of ‘child’s play’, and as a magical object – the ‘magic roundabout’. While appealing to audiences, each of these representations, as described in this chapter, has hidden costs.

In emphasizing itself as a positive solution, rather than communicating the complex problems involved in supplying water in the developing world, the *PlayPump* leads audiences to think that the problem will be solved through their support. Behind the *PlayPump*’s representation of gratitude and celebration in the developing world, it conceals the anger and frustration there, both of users of the *PlayPump*, and more widely, as represented by groups such as the APF who contest the role of private enterprise and multinational corporations in water supply. It allows the first world public to believe that they can challenge complex problems in the developing world simply through changing the brand of bottled water they drink, or by making donations to advance attractive yet unproven technologies.

The *PlayPump* is an innovative object only in the spectacular, broad brush-strokes way in which innovation is communicated through the press to first world audiences. Its innovations are more effective as a compelling image than they are for users. Innovation in the appropriate technology or water development sector is likely to be on a much finer level, as it has taken place over decades of work. And novelty in the appropriate technology sector is not necessarily desirable: it asks users to deviate from actions to which they are accustomed, and it increases the likelihood that there will not be a material support base for a new technology. There is a disjuncture between the role of the *PlayPump* as a means to perform a necessary daily function, and as a spectacularly innovative object. In the first world we do not expect such necessary daily functions as acquiring water to demand a creative performance.

The *PlayPump* as a technology for children to operate benefits from its association with children as popular icons in development campaigns, and from the impression of simplicity and ease – child’s play – it communicates. But in inscribing children into the object, it distorts its adult users, both in hurting their bodies as they bend down to turn the roundabout by hand, and in more psychological and metaphorical ways by humiliating and infantilizing them. As earlier expressed, the *PlayPump* insists that they be children.

The effect of the *PlayPump* as a ‘magic roundabout’, of accomplishing work without labour, relies, as argued in this chapter, on the illusion that all the parts of the *PlayPump* system operate independently. To achieve this, mechanisms by which water is pumped are concealed. Though the system does this well in creating a convincing illusion for the onlooker, the benefit to the user fails to convince: the wheel is hard to turn, the pump produces less water because of its confined movement, and the water has to be pumped further. Once more, we see image achieved at a cost to the user.

The *PlayPump* is an example of design for development with exceptionally well-developed symbolic and communicative capabilities. We may be hard-pressed to find other examples from the field that approach the level at which it creates such complex and multiple narrative images. But while it may be the most literal example of this trend, it still illustrates the dangers of framing objects in this way. Using design for development objects for advocacy gives first world audiences too much influence in determining technologies for developing world use, and displaces the emphasis from their value to the user, to their effectiveness as image. If anything, objects which produce compelling narratives should be received especially cautiously, and their performance on the ground carefully evaluated before choosing to celebrate them.

9.3.4 ‘A revolution in design’?

Chapter 2 recorded some curators’ and practitioners’ description of design for development as a ‘revolution in design’, a claim contributed to by the other characteristics noted for the field: its high visibility, its claims for high impact and its use for advocacy. These curators and practitioners also claim that its practice is increasing. The phrase ‘a revolution in design’ derives from Polak’s call for a “revolution” to extend design’s services “to reach the other ninety percent” of the world not currently served by design (2007, p.18). Bloemink, curator at the Cooper-Hewitt, which used Polak’s term ‘the other 90%’ to title their exhibition, described this revolution as a shift in the attention of designers away from “a culture with disposable income... seeking fulfilment of *desires* rather than genuine *needs*” towards “the suffering of

those lacking even the basic necessities” (2007, p.6). This formulation of developing world ‘needs’ over first world ‘desires’ is repeated across design for development forums.

The analysis of the *PlayPump* in this thesis suggests the risk that objects designed ostensibly for developing world needs may in fact cater for first world desires, to the detriment of those needs. This is caused in part by a feature of the revolution proposed by Polak: that entrepreneurs can satisfy the needs of developing world users through profiting by them. As noted in Chapter 3: Fluid technology, Polak writes that there is “money to be made” for designers who design “specifically for poor customers” (2007, p.19). The poor in the developing world, he writes, are “a huge, unexploited market, which includes billions of poor customers”, and there is only one “truly sustainable engine for driving the process of designing cheap”: “because that’s where the money is” (Polak 2007, p.25).

Roundabout Outdoor pursued profit for itself – Field is proud to call himself a capitalist and a ‘philanthpreneur’. This pursuit of profit led Roundabout Outdoor to jealousy guard maintenance of its systems, which, as it is intimately linked to the income from billboard advertising, is the source of its profits. UNICEF and SKAT identified Roundabout Outdoor’s excessive centralisation of power with itself as a cause of the poor maintenance record for *PlayPump* installations.

The pursuit of profit must also have influenced the images of the *PlayPump* allowed to reach first world audiences – with the *PlayPump* its only product, Roundabout Outdoor had no incentive to undermine the positive reception the project received in the first world, or to question its good fortune in being selected for multimillion dollar programmes for its advancement. We know that Roundabout Outdoor and/or its partners acted to suppress both UNICEF and SKAT’s critical reports: neither of these became public until the dissolution of PlayPumps International. And as a for-profit business, Roundabout Outdoor had an incentive to exaggerate the capabilities of the pump to elevate it over competitors, something it succeeded in doing.

The *PlayPump* is given ‘free’ to communities – though as Erpf noted, at least some communities “prefer paying while keeping control of their services” (Obiols and Erpf 2008, p39). Or as Joaquim George, of Mozambique’s Rural Water Authority, told Costello: “we know it is free, but it doesn’t work properly” (Costello 2010c). The *PlayPump* is instead paid for by first world donors. It has this in common with many other examples of design for development, some mentioned in this thesis: the ROSS, for example, is intended for purchase by humanitarian organisations, who will distribute it to developing world users; so too is the

Hippo Water Roller, the *LifeStraw*, the *OLPC*; the *Lifeline* radio; and the *SUNNAN* lamp. The prepaid meter is another example of an object that supplies ‘free water’, but makes a profit for multinational corporations, to the detriment of its users.

If the private businesses producing these development objects are to make a profit from them, then they need to go to where the money is – not in the developing world, as they demonstrate through their business models, and contrary to Polak’s suggestions, but to the first world. The idea that the poor in the developing world are a viable market for first world businesses, apart from its dubious morality, is undermined by the case of the *PlayPump*: its sustainable model for maintenance was premised on the idea that businesses would see the value in advertising to poor rural audiences, and businesses demonstrated that this is not an attractive proposition. And in relying on first world audiences for support, businesses will design products to appeal there, not necessarily for what works best in the developing world. This is also what the *PlayPump* has demonstrated, that the needs and desires of first world audiences are a more powerful influence on a project than the needs of developing world users, so products which rely on first world support will tend to be designed in that direction.

In relying on first world businesses to supply the needs of the poor in the developing world, developing world users are made vulnerable to forces outside of their control. This was one of the main motivations of the appropriate design movement, to increase the self-sufficiency of people in the developing world, through the critical realisation that in systems where the poor and the rich are connected, resources will tend to flow to the rich. The *PlayPump* demonstrates this case too, both in the way in which the advertising-funded model for maintenance was undermined by the global financial crisis, and in the way that most of the benefits of the *PlayPump* system flow to the already powerful, not to the poor.

The revolution proposed by Polak et al is not a revolution that will inspire the poor in the developing world – the ‘revolutions’ there, led by activist groups such as the APF, are against the encroachment of private interests into the development sector, as transnational corporations seek to supply basic services to the poor in much of the developing world. But even within the field of design, to what extent is the revolution they are proposing really a fundamental challenge to mainstream design?

For a start, we have demonstrated that in fact first world desires are still what is targeted by at least some examples of design for development, and that this is a risk throughout the contemporary sector. We have also, through the other examples described in this thesis, other models of design to which we can compare this revolution. These models, such as critical and

interrogative design, mount a challenge to the affirmative and productivist nature of mainstream design, not just who it serves.

It may seem fanciful to question ‘design as problem solving’ when it comes to designing for developing world need, and of course there is a call for design as a pragmatic, problem-solving practice in meeting developing world need. The Zimbabwe Bush Pump is an example of a successful design of this type. “It is so well-designed and parsimonious”, write de Laet and Mol, “that, according to V & W’s director, efforts to reverse-engineer and reproduce it always result in a pump that has more parts; that is more complicated, and unnecessarily so... as Morgan notes, ‘the designer knows when he has reached perfection, not when there is no longer anything to add, but when there is no longer anything to take away’ [Morgan, 160]” (2000, p.236).

But there are reasons for considering the approaches to design suggested by anti-productivist tendencies, when applied to design for development. In Bonsiepe’s address to the conference *Design for Need*, as recounted in Chapter 3, he identified the “heavy emphasis” first-world economies place on “individual consumption and privately owned artefacts”, which makes them only “accept and register needs... when these needs can satisfied by objects in the form of merchandise” (1977, p.14). He argued in the same presentation that “critical” designers “have lost the innocence that assumed one can influence social organizations through man-made objects or ‘hardware artefacts’. Revolutions are definitely not achieved through objects and even less through ‘designed’ objects” (Bonsiepe 1977, p.13).

If Bonsiepe could argue in 1977, at a conference looking at design for need, that sufficiently critical designers already know that there will be no revolution through ‘designed objects’, then how is it that exactly this call for a revolution through designed objects is made today? Have circumstances really changed that much between 1977 and 2005, or is it more that design directed at the developing world has been changed by the pressures on it, rather than itself changing the system of design?

This is what was suggested in Chapter 3, that design for development has taken on a form quite out of keeping with its original, more critical roots in the appropriate technology movement. That this might happen was predicted by another speaker at *Design for Need*, Thomas Kuby, who in his address delivered a warning about the conference’s theme:

Although occasionally and against terrific odds, alternative structures emerge, their proliferation and widespread use is blocked by strong social, political and economic forces which shape the existing technology. Hence, alternative

projects are bound to either collapse or to adapt. There is little ground for assuming that alternative technologies can grow to such strength that they indeed begin to change social conditions instead of being diluted, absorbed and disposed by them. Inevitably therefore, Design for Need is up against politics... Design for Need, I would argue, is possible only as a 'strategy of conflict' with the designers themselves acutely aware of the political implications of their work. Design for Need must politically side with the poor and the underprivileged or else it will fail (1977, p.33).

Kuby's prescient warning makes it clear that if design for need, and design for development is to succeed at its apparent aims, to help the poor in the developing world, it cannot rely on business, or on 'philanthropreneurs', but must cultivate a more political and critical attitude to design and to development, which looks to the causes and complexities of developing world need rather than emphasizing only positive, instrumental means to 'solve' them.

The 'revolution in design' advanced in design for development circles at present is not critical enough of the negative effects of profit, the imbalance within systems that connect the first to developing worlds, and the limits to technological fixes. The revolution in design may lie elsewhere, this thesis suggests, in the realms of critical and interrogative design, interventionist art, and activist responses to social problems, with those agents willing to engage in 'strategies of conflict'. Wodiczko issues a challenge to our imagination when he suggests that his proposal for critical vehicles makes "a more general call to a postprogressive, interrogative design, leading to "productivism" of a new kind. It would bring critical methods and new, perhaps difficult to accept but vital, functional programs to the design of tactical equipment" (1999, p.xvii). This is a place where we could begin to look for another type of 'revolution in design' than that presently envisaged in design for development.

9.3.5 Conclusions

This thesis has identified some risks inherent in contemporary forms of design intervention into the developing world – what this thesis calls 'design for development' – largely through its analysis of the *PlayPump*, though also through looking at the history of the sector. This section identifies some areas where positive intervention may be possible, offers the outline of a one-page analytic tool that may be used to analyse other design for development objects, and looks a little more closely at the role of 'sustainable business' in development.

While identifying the risks in ‘contemporary design for development’ in the sections above, we can go further in specifying what type of projects are most vulnerable to these risks. As Chapter 2: Design for development and Chapter 3: Fluid technology identified, design for development is a wide and varied field of activity. This thesis has described contemporary work ranging from Amy Smith’s ‘fuel from the fields’ project, setting up local industries using local materials and simple processes for the poor to generate income, to mass-produced objects marketed (either for purchase or other forms of support) to first world consumers: such as the *LifeStraw*, *Freeplay* radios, or the *PlayPump* (via *One Water*). This thesis focuses on the latter type of object – the risks noted above are a result of having significant first world audiences to a project, especially where the pursuit of that audience influences the design of the object.

Does this mean that a conclusion of the thesis is that the former type of design for development – that which stays closest to the original tenets of the appropriate technology movement – should be favoured? To some extent, this could be a reading of the thesis: especially as later work in the field, as described by Amy Smith in Chapter 3, seeks to give users more power within the design process. This is the antithesis of the closed loop that characterises projects designed by first world entrepreneurs, to appeal to first world audiences, in which good effects for the user would be a happy accident. The exclusion of the voices and needs of users is one of the problems identified in projects that rely for their success on first world public support.

But beyond this broad observation, it is not the intention of this thesis to make specific contributions to this area of contemporary appropriate technology work, user-led design or ‘co-creation’. This is after all a field of expertise decades in the making, and one that relies on actively working with users; something this thesis has not done. There are broader questions too, a wider frame around this area of research: about the role of small-scale technology in development – what is its significance to and long-term impact on development? How does it rank in impact besides the development of technology infrastructure, or against policy, politics, activism, representation, social organization, and so on – amongst the many other means for social and economic change? This again is a question this thesis might pose, but not one that is within its scope to answer.

The contribution this thesis makes is to identify an emerging phenomenon, the mainstreaming of earlier approaches to designing small-scale equipment for developing world use, and to analyse the risks that these new approaches carry. It does so to add a critical voice to a discourse which is otherwise not critical enough, and on which high expectations and large

amounts of money are reliant. It is not the specific intention of the thesis to offer advice on how to reform these recent approaches, or how to ‘do it better’ – as the previous paragraphs note, this would be both to assume the answer to the broader question of what value small-scale technological approaches offer to development, and to advocate approaches to designing for developing world users which this thesis has not done enough to validate. It would also, I feel, make me yet another person outside the intended user group for such objects – the poor in the developing world – continuing the problematic practice of designing for others across the ‘screen’, rather than supporting needs and solutions coming from these groups.

What ‘advice’ this thesis can offer is not so much to the designers of new objects, but to the bodies which are engaged in the discourse around design for development, and especially its representation to the first world public. We can identify exhibition curators and journalists amongst this group. The task for design curators is to produce more complex analyses of design for development objects, not to simply celebrate them for their intentions. To do so they might connect disparate objects to each other, as the *PlayPump* to the prepaid meter, using them to reveal aspects of each other and the systems they are part of; they might look specifically to subvert the spectacular, and to identify the negative effects that novel objects brings to development, as well as the positive. They might question how using functional objects for advocacy and story-telling may be seductive and misleading, as well as potentially activist and ‘awareness-raising’.

Journalists have played a crucial role in advancing design for development objects; Amy Costello’s depiction of the *PlayPump* was hugely influential. Journalists are now at a point where, like Costello more recently, they must lose their innocence about design for development, acknowledging that “humanitarianism is an industry”, and like other industries, as Philip Gourevitch writes in the *The New Yorker*, should be treated “the same way we treat other powerful public interests that shape our world. Too often the press represents humanitarians with unquestioning admiration. Why not seek to keep them honest?” (2010). When *The New York Times* claims in an editorial that the *PlayPump* is “more efficient, easier to use and cheaper to run than wells with hand pumps”, it is clearly not holding its sources up to the same level of scrutiny or accountability which it would demand (we would hope) from a new model of car brought out by General Motors, for example (2003). “Why should our coverage of them [humanitarian or human-rights organizations] look so much like their own self-representation in fund-raising appeals?” writes Gourevitch (2010). “To treat humanitarian or human-rights organizations with automatic deference, as if they were disinterested higher authorities rather than activists and lobbyists with political and institutional interests and

biases, and with uneven histories of reliability or success, is to do ourselves, and them, a disservice” (Gourevitch 2010).

The work of this thesis suggests that thoroughly analysing contemporary design for development objects requires a multi-disciplinary perspective. I can offer a rough outline for an ‘analytic tool’ for analysing design for development in this way. This is shown in fig 9.5 on the following page. This one-page document formalises the series of ‘critical lenses’ that have been applied throughout this thesis to the *PlayPump*, suggesting that they could be applied to other objects, particularly design for development objects. It might also be possible to use it to create other objects, especially those that combine functions for the user with communication to audiences. It may also make for a good teaching tool.

Lastly, the thesis returns at this point to a further commentary on the goods that are offered by the *PlayPump*. If we compare the *PlayPump* to the Zimbabwe Bush Pump once more, we can recognize that the *PlayPump*’s attempts to supply a ‘sustainable business’ model for the installation and maintenance of pumps is at least attempting to answer a legitimate need. The Zimbabwe Bush Pump program, as was documented in Chapter 3: Fluid technology, has suffered from diminishing funds – the *PlayPump* attempts to create a constant source of funds through advertising income. The Zimbabwe Bush Pump too is reliant on outside donors, as is the *PlayPump*.

This thesis has been critical of the role that the private sector played in the *PlayPump* system – it led to Roundabout Outdoor keeping tight control over maintenance, a lack of transparency with donors, and higher costs through profits to its producers. But this thesis cannot simply pitch public funding and administration as ‘good’ vs. private sector involvement as ‘bad’ – the Zimbabwe Bush Pump also combines public and private sector, but in a more winning combination. Originally only manufactured by the state, Morgan tells me that production of the pumps rose dramatically when the Zimbabwe government opened manufacture to the private sector (while still regulating around it) to companies such as V&W Engineering (2011). Their combination of ‘open technology’ (not patenting the pump), allowing its manufacture by competing private companies, and funding the purchase of the pumps through funds from donor groups, has led to a largely more sustainable business model than the *PlayPump*, which has many of the same components in its system, but in less successful combination. Morgan tells me that the pump program is in the process of being revitalized at present, with increased foreign interest. A subject of future work, for myself or others, would be to pursue more closely different ways of combining private and public sector involvement in development.

Objects in development: An analytic tool
<p>This chart can be used to analyse objects, particularly those which combine immediate functions for the user with communication to audiences. Apply each of the lenses below to the object you want to analyse. It could also be used to design objects.</p>
Fluidity lens
<p>‘Fluidity’, described by De Laet and Mol in their paper ‘The Zimbabwe Bush Pump - Mechanics of a Fluid Technology’ (2000), is a measure of an object’s appropriateness for use in contexts such as the developing world. It has these 3 components:</p> <p>The object’s boundaries - what does the object rely on to function well? Users? Other equipment and documentation? What does it have in common with other technologies? How widely, and how narrowly, might you draw its ‘boundaries’?</p> <p>Its working order - what compromises does this technology make in order to function well in some areas, while sacrificing in others? Does weakness in some places make for strength in others? Is it strong but brittle, or tough and flexible?</p> <p>Its maker - what kind of figure is the designer, producer or promoter of this object? Do they hold tight control? Do they claim sole credit for it? Or do they acknowledge the influence of others, and learn from how the technology is used?</p>
Interventionist art lens
<p>Interventionist art aims to intervene materially in society, addressing social issues. This can involve producing functional objects to equip vulnerable groups, that also act as commentaries on the social issues they address.</p> <p>The object’s relationship to circuits - what systems in society does it take from, contribute to, or reveal? To whom does it distribute benefits?</p> <p>The object as a ‘critical vehicle’ - for what actions does it equip the user? Does it give them a platform, or a voice? How does it carry issues to other audiences?</p>
Critical design lens
<p>The designers Dunne & Raby outline approaches to a ‘critical design’ practice, where objects and scenarios of use are designed less for their instrumental usefulness, and more to stimulate debate, revealing our relationships with present and future technology.</p> <p>The object’s ‘para-functions’ - how could the object’s functions be ‘read as criticism’? What does the object enable, and how does that relate to societal norms and ethics?</p> <p>The object as ‘material tale’ - could this object be a prop in a story? What type of stories does it tell? How could you interpret it as a character in a narrative?</p>
Antiprograms lens
<p>Objects intended for use by the poor in the developing world may not be welcomed as intended - they may instead be rejected for their ‘political properties’, especially if they enforce such agendas as privatisation of basic services.</p> <p>Programs and antiprograms - what are the political properties of the object? How might it be seen as ‘prescribing’ certain ethics or values in the user? If this object was a person, what would be their character?</p> <p>Protest and participation - what level of representation is used to gain acceptance for this technology? Is it effective? How might it become a site of protest?</p>

Fig 9.5: An analytic tool for analyzing ‘objects in development’.

9.4 Objects in development

The previous section reappraised design for development, in the light of the deep analysis of the *PlayPump*, and in comparison with activity in other fields. The *PlayPump* was analysed largely by interrogating it through a series of critical lenses, perspectives established through the examination of similarly functional, communicative objects in other arenas.

But while this is the main contribution the thesis makes, to construct a complex, multidimensional portrait of the *PlayPump*, and so also establish a critical tool that might be used for the analysis of other objects, these examples from other arenas are not in the thesis simply as props to analyse the *PlayPump*. They are discussed in this thesis for the value they offer individually, and also for the collective picture they produce of activity across disciplines and contexts – the wider use of ‘objects in development’.

‘Objects in development’, the subtitle to this thesis, is a pun: it implies both the use of objects used for development, and also that these objects are themselves in a state of development – they are not yet fully formed or understood. This is a contention of the thesis: that functional objects designed to have both instrumental value for the user, and strong communicative abilities to audiences, are an emerging phenomenon across areas of activity, and that while there is evidently an interest in such objects, and research into them underway, they are still somewhat mysterious.

Because they are mysterious, they are powerful in sometimes deceiving ways: the *PlayPump* was received by audiences, from journalists to politicians, heads of charitable foundations, and members of the public, on the terms by which it represented itself. Its powerful abilities to communicate compelling narratives to these audiences seduced them – along with the other features of the relationship between first world and developing world described in this thesis. That its appearances might be deceiving, that there might be a mismatch between its power as image, and its power as a tool for users, seems to have eluded most audiences.

This is why such objects must be the subject of more research, to map and understand their power, and to examine how they function differently in different arenas. While we look widely, and detect shared activity across areas of production and in broader social contexts, we still have to critically differentiate objects seen within this trend. Because in the end, the tragedy of the *PlayPump* is partly one of miscategorisation: a ‘category error’ which led an object with powerful story-telling abilities, that might have performed well as an artwork or a critical design object, to be imposed on developing world users as a technology for accessing a

vital, daily resource. We have a responsibility to continue investigating objects like these, in order to avoid visiting such errors on people who have little power to resist them, and if we are not too, as audiences, going to remain subject to their power instead of learning how to properly perceive and use them for the powerful capabilities they offer.

9.5 Contributions

As described in the introduction to the previous section, and in the introduction to the thesis, the main contribution to knowledge that this thesis makes is in constructing a complex, multidimensional portrait of the *PlayPump*. In doing so, it also establishes a critical tool that might be used for the analysis of other objects.

This construction of a complex image of the *PlayPump* is a creative and critical act. It required drawing broadly from a number of object-examples across a wide range of activity, in order to delve deeply into a singular example. The first step in constructing this image was selection. As noted in Chapter 1, a trend has to some extent already been observed, with exhibitions such as *SAFE* drawing together functional, communicative objects from across fields. But this thesis selected both the main example, the *PlayPump*, to be analysed in a way that it had not been so far, and it selected the series of other examples through which to analyse it, using them in ways in which they have not been used before.

This thesis first of all selected design for development as the area of production to focus on, out of the broad view across different arenas at which the research for this thesis began. It selected design for development because this was the area that seemed to have the most possible consequence: aiming to provide vital equipment to people who need it, in extreme circumstances, at a scale of production apparently far higher than activity in other areas. This is where the highest funding goes, and the most apparently realistic hopes for impact. The thesis identified a limited set of characteristics for the arena, as an original contribution. These categories of analysis proved to be effective at analysing the field.

Out of all the possible examples of design for development available, the thesis selected the *PlayPump*, and this proved to be a very rich example for analysis. It is different to other examples of design for development that might have appeared to more obviously contain contradictions with design for development's earlier history in the appropriate technology movement, such as the mass-produced consumer items also described in this thesis. The *PlayPump* offered more of a challenge in that it presented some of the characteristics of an appropriate technology, as a relatively simple mechanical object, locally produced in the

developing world. For the first three years of the four-year research and production period for this thesis, no critical information about the *PlayPump* was available. During this time, the suspicions about it that guided the arguments in this thesis were already arrived at. More recently available evidence adds significantly to the impact of the thesis, and strengthens and deepens its arguments, but it is gratifying to have the earlier analysis validated by events.

The thesis selected examples of objects from across areas. Some of these were suggested by selections already made by others. Interventionist art and critical design projects were already exhibited alongside design for development objects in *SAFE*, for example, as well as selected for design competitions such as *INDEX*. Exhibition such as *Return to Function* blurred the boundaries between functional art and design. Dunne & Raby's work was a natural choice for design looking into the territory of art, as two of the very few producers and writers about design beyond productivism. But my work in interviewing Dunne helped to extend critical design in ways not predicted by their work – as his interview suggests, he considers their work largely confined to first world contexts, but at my invitation he generously 'thought into' the space of design for development, making connections between critical design and that field.

The inclusion of the APF and the prepaid meter in the thesis as a way of isolating the characteristics of the *PlayPump* was my original contribution. This was one of the first connections I established in my research: the first part of the title of my thesis has in fact remained the same from the start – 'Radical Plumbers and PlayPumps' (the subtitle 'Objects in development' came later). These two polar response to water supply to the poor in South Africa, both combining instrumental action and communication, has fascinated me from the start. Their presence in the thesis is a small contribution towards including representations from users in the developing world, in a discourse about programs of action usually designed by and for others.

The thesis selected particular texts to use in analysing objects. While some texts naturally suggested themselves, as already connected to particular objects, such as Wodiczko's work in connection to Rakowitz's, or Dunne and Raby's texts in connection to critical design, others were more creatively combined. Cildo Meireles' 'Insertions into Ideological Circuits', for example, was an appropriate choice for analysing *paraSITE* and *Brinco*, but as far as I am aware, has not been used for that purpose before – and using his text in that way required extending its meaning to the redirection of benefits within circuits, something not contained in the original text. Bruno Latour's revealing concept of programs and antiprograms was well suited to the analysis of the APF's interaction with the prepaid meter, but in comparison to

the examples noted in his text, of everyday first world objects and appliances, the thesis took his work into more dramatic and vital territory.

De Laet and Mol's text 'The Zimbabwe Bush Pump: The Mechanics of a Fluid Technology' made a major contribution to my thesis, proving to be a very revealing way of analysing the *PlayPump*'s performance. This thesis owes the depth of this part of the analysis of the *PlayPump* to their work. But I also hope that my use of their text has extended it beyond its original boundaries. There is a close comparison between the Zimbabwe Bush Pump and the *PlayPump*: both presented as appropriate technologies, both water pumps, both operating in rural southern Africa. But in applying their text, ten years after it was published, to a new type of technology wearing the guise of appropriateness, I contribute to revealing a worrying trajectory within design for development, a deviation, in which objects become frozen, not fluid. And I transform the meaning of their text, in that where they use fluidity only as a way of positively evaluating the Zimbabwe Bush Pump, I do not simply find the *PlayPump* to be 'not fluid', but locate its fluidity in other parts than those of benefit to the user. In this way I use their framework to arrive at negative conclusions about the *PlayPump*.

A contribution the later parts of my research make is to analyse and synthesise the various reports that recently became available about the *PlayPump*'s performance. While now publicly available, these previously suppressed reports have yet to make a wide impact. In synthesising material from across reports into a coherent, evidence-based list of ten main faults in the system I have, to my knowledge, performed work which has not yet been done; and I hope that this will make some contribution to criticism of the *PlayPump*, and that it might be further refined to reach a broader public, challenging their positive image of the project.

The minimal 'field work' I have performed for this thesis was so informal that it should hardly be called by that name; within the scope and time-frame of the research for this thesis, I was not able to institute a properly codified evaluative process for performing such work. But in the context of how little first-hand observation there is of the *PlayPump* in context, my observations of ten *PlayPump* installations in the field make some small contribution to knowledge about the system, and provided visual material for analysis.

Chapter 7 and 8's extensive analysis of the *PlayPump* produced more observations about the system than I could ever hope to include within the arguments of this one thesis. In this sense, the arguments in the re-presentation of the *PlayPump* in Chapter 9 only make selective use of this material, as comprehensive within the bounds of this thesis as I hope they are. This also frames the material produced in Chapters 7 and 8 not just as steps towards the conclusions in

Chapter 9, but as significant observations in themselves about many aspects of the *PlayPump* – observations that may be picked up and used by others.

This section has described how the complex and multidimensional image of the *PlayPump* was constructed. In the process of creating an image of the *PlayPump* another object has been created: something which can be used to look at objects from many angles, something made of grids and meshes, divided up and riven through with multiple layers and perspectives, yet which is also something whole in itself: in describing it I am attempting to create a word sculpture that depicts an analytic tool. This is the other object I have made in constructing a portrait of the *PlayPump*: a tool that other people may use to analyse objects, especially those multifunctional objects that combine instrumental value for users, with communication to audiences.

9.6 Future work

The previous section describes the contributions this thesis makes, and in the process, identifies some possible directions for future work. Others may wish to use the detailed observations made about the *PlayPump*, as listed in Chapters 7 and 8, for further work, as this thesis only makes a selected set of arguments from them. The list of ten major faults in the *PlayPump* system I hope might be useful to anyone studying the *PlayPump* further, or planning to campaign against the program's continued expansion. The analytic tool constructed in the process of interrogating the *PlayPump*, of which a version is supplied in the 'Conclusions' section to 'Reflecting on design for development' in this chapter, I hope will be useful to the further study of objects.

There are some small projects I plan to undertake myself, to further the work in this thesis. As an example of academic work, I plan to submit a paper titled 'The *PlayPump*: Mechanics of a Static Technology' to *Social Studies of Science*, the journal that published De Laet and Mol's original paper, 'The Zimbabwe Bush Pump: Mechanics of a Fluid Technology' in 2000. My paper would pay homage to their formulation of fluidity as a measure of appropriateness, as it was influential in my analysis of the *PlayPump*, but would be more than simply a response to their paper. It would use their paper, from a decade ago, as a reference to the mainstreaming of appropriate technology that taken place since then, describing a modern pump that works in very different ways to the Zimbabwe Bush Pump, yet is still described as 'appropriate'.

As a wider objective, I will be aiming to make contributions to science and technology studies through documenting some of the mechanisms I have observed at work in the *PlayPump*

system, and other design for development objects: particularly my identification of the ‘flexible membrane’ which divides first world audiences from developing world users.

I have been invited to submit a proposal for post-doctoral work to the Centre for Civil Society (CCS) at the University of KwaZulu Natal in Durban, South Africa. The CCS is an activist-oriented department in development studies – they work with grass-roots social movements in South Africa, such as the APF. They are interested in the contribution my thesis work (and its continuation) can make to understanding the role of appropriate technologies in South Africa. In the South African context, as in some instances documented at the start of Chapter 6: Antiprograms, the urban poor often do not welcome appropriate technology interventions, however well intentioned, seeing them as marking out their inferiority in comparison to the convention services given to the middle-class suburbs. My research into complex ways of reading and understanding small-scale technologies can contribute to this area.

I have also been invited to co-author a paper by an academic in the Business and Economics department of Monash University, Australia, who has identified my work on the *PlayPump* as useful to his research into the possible negative effects of social-cause marketing. I look forward to contributing to this area.

Further academic work that could be pursued by others if not myself could be an investigation into the influence that magical thinking still plays in modern Western society, as evidenced by the *PlayPump*. As a magical object which creates a seductive illusion for viewers, the *PlayPump* is a modern example of a much older concept, of a ‘glamour’, an enchantment or spell; as in the phrase “*to cast the glamour over one...* a magical or fictitious beauty attaching to any person or object; a delusive or alluring charm” (The Oxford English Dictionary 2nd ed. 1989).

Alfred Gell, in his text alluded to in Chapter 2, which framed the *PlayPump*’s offer of work accomplished without labour as ‘the magic-standard’, refers to the “equivalent of the magic standard” in modern business practice: “ideal ‘costless’ production. This is actually not costless at all, but the minimization of costs to the corporation by the maximization of social costs which do not appear on the balance sheet, leading to technically generated unemployment, depletion of unrenowable resources, degradation of the environment, etc.” (1992, p.227). Gell’s identification of magical thinking in modern production connects the *PlayPump* back to Schumacher’s motivation for the production of appropriate technologies – another route back to the same material, via (as if by?) magic.

Further to academic work, my immediate concern with my thesis is to translate its findings into other media, with the intention of reaching broader audiences. My main target is

audiences in the first world, including the public as well as decision makers. This thesis notes that criticism of the *PlayPump* project has not so far had wide impact on public perception of the project, which still seems to enjoy a high level of support. My intention is to place critical information about the *PlayPump* into greater circulation in the mainstream press, possibly using the tactics of interventionist art outlined in the thesis.

To further this goal, and to attempt to address some of the harm caused by the *PlayPump*, one approach will be to create communicative routes between users of the *PlayPump* in the developing world, and audiences in the first world. My intention with such work is to perforate the screen that divides first world audiences and developing world users, addressing the unaccountability with which these audiences support the introduction of programs in the developing world – however well-intentioned this support is.

I also intend to publish a book that will include the story of the *PlayPump*, but that captures the broader ideas in my thesis. This book would seek the same readers as such design for development books as Architecture for Humanity's *Design Like You Give a Damn*, but introduce a new critical voice to this arena.

I expect 'Objects in development' to be the wider frame of research to which I will continue to contribute, and hope that my work will be useful to others in building further on this area of inquiry.

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