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*Title:* The *PlayPump*: Mechanics of a Static Technology

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*(This is the script of my presentation)*

Hi everyone at PSi16, Performing Publics, in Toronto. My name is Ralph Borland. I'm speaking from Dublin, Ireland, where I am towards the end of my PhD at Trinity College, in the department of Electronic and Electrical Engineering. I've been conducting cross-disciplinary research into contemporary objects designed for use in the developing world: think of designed objects like wind-up or 'clockwork' radios; the *LifeStraw*, which filters dirty water; the *Hippo Water Roller*, a rolling water barrel that saves women from carrying water on their heads; and the *One Laptop per Child*, or *'$100 laptop'*. Hopefully you will have heard of at least one of these objects, or can think of similar ones.

My paper today, titled 'The *PlayPump*: Mechanics of a Static Technology', draws on my PhD thesis. My thesis is titled 'Radical Plumbers and *PlayPumps*: Objects in development'. One of the central arguments in my thesis is that 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 threatens to supersede the needs of the intended users of such objects in the developing world. I will provide a brief outline of my thesis, and explain that title, further into this presentation.

The central case study in my thesis, and the focus of this paper, is an object called the *PlayPump*. The *PlayPump* is a water pump driven by a children's roundabout, intended for use in rural areas of the developing world. Most *PlayPumps* are installed in South Africa, where it was invented – there are around 1,000 of them at present. The *PlayPump* is designed so that children's play on a roundabout pumps water to an elevated water tank nearby, from which water can be drawn. The water tank carries billboards, which are rented out for both commercial advertising and public service messages – about HIV/AIDS prevention, for example. The income from renting out the billboards pays the company that produces the *PlayPump* to maintain the pumps. This is presented by the *PlayPump's* manufacturers as the means of its 'sustainability', along with the fact that it uses 'clean' energy. As the promoter of the system, Trevor Field says, "there's nothing quite like children's power as a pure energy source" (World Bank 2004).

The *PlayPump* has done extremely well in engaging the attention of publics in the first world, through stories about it in the mainstream press. The first *PlayPump* was installed in South Africa in 1993, but it didn't start to receive a great deal of attention until about 2000, when it won an award from the World Bank for "innovative solutions to development problems" (Bloom 2004, p.20). They described how the *PlayPump* "captured the attention of many" (ibid). International interest in it started to gather pace. The New York Times ran an editorial about the *PlayPump* in 2003. PBS in the United States made a short film about it in 2005, which received a huge response from individuals in the US and around the world – PBS described an "overwhelming interest from Web viewers" (Frontline/World 2005). School children in the US started fund-

raising projects for the *PlayPump*. Hiphop star Jay-Z promised to raise US$400,000 for the *PlayPump* through his 'Water for Life' concert tour. A company in Britain launched a brand of bottled water called One, whose profits go to the *PlayPump*. National Geographic and the BBC also made short movies about the *PlayPump*. And in 2006, former US President Bill Clinton called the *PlayPump* a "wonderful innovation" in an article for Time Magazine (Clinton 2006).

Clinton was prepared to put his money where his mouth is – that same year, his President's Emergency Plan for AIDS Relief announced a US$60 million public-private partnership with Playpumps International (US), which had just been established that year by the Case Foundation to raise funds for the *PlayPump*. US$10 million came directly from the US government. First-Lady Laura Bush joined Bill Clinton and Steve and Jean Chase on stage to make the award to PlayPumps International. This funding was to pay for the installation of 4,000 *PlayPumps* across Africa, which they said would provide clean water to 10 million people.

This was to prove the high point for the *PlayPump*. In 2007, a report by UNICEF drew attention to shortcomings in the *PlayPump* system (though this report did not become publicly known until late in 2009). UNICEF inspected *PlayPumps* installed in South Africa and neighbouring countries, and noted many of them without adverts or messages, meaning money was not coming in for maintenance. They reported that the capabilities of the *PlayPump* were oversold – children could not play on it for long enough in a day to supply the community's water needs, and so adults often ended up pumping water, turning the roundabout by hand. *PlayPumps* sometimes replaced existing hand-pumps, and this angered some communities who felt they had not been consulted about the change. While some *PlayPumps* installed in primary schools seemed capable of generating enough water for the immediate community, the *PlayPump* was clearly not appropriate as a general solution to the provision of water, and not at the scale advertised by its makers.

In 2009, a new CEO was appointed to PlayPumps International, Gary Edson, formerly a high-ranking official in International Economic Affairs in the Bush administration. 100 days after he took office, in September 2009, he published a report on the PlayPumps International website, which for the first time acknowledged problems with the system. He announced the suspension of further production of the *PlayPump* until an external review of the system could be completed. The charity WaterAid produced a letter a few weeks later, explaining why they do not support the use of *PlayPumps*: too expensive, not designed for local maintenance, not filling any particular technological gap, and reliant on child labour. Within months, PlayPumps International had suspended its operations, handed over the remainder of its stock to another organization to install, and took down its website. It has now, for all purposes, disappeared, though the company that originally produced the *PlayPump* in South Africa, Roundabout Outdoor, is still trying to attract funding for the system.

The release of critical information about the *PlayPump*, and the dissolution of PlayPumps International, happened three years into my research. Up until that point, there were no critical reviews of the project in the press, and very little detailed information about the project released by its producers – not just to the public, but even to their own partners. There has been no reported self-evaluation of the system in the whole time it has been run, and no evidence produced for the very broad claims made for the capabilities of the system. Given this lack of available information and critical voices for most of my research, I had to employ other methods for studying the *PlayPump*.

My method was to identify objects that shared some of the characteristics of the *PlayPump*, but that were also different to it, and that came from different areas of society. It was clear from the start that what the *PlayPump* was very good at was communicating to audiences: it is an immediately accessible, smart idea that produces appealing images of children's play 'effortlessly' producing a social good in poor environments. I gathered examples of other functional objects that communicate to audiences: examples of interventionist art, such as inflatable shelters designed for homeless people in the US, or shoes designed for Mexican border jumpers, projects that were designed as much to elicit public debate as they were to provide a good to the user; examples of 'critical design' - objects produced by industrial design academics to stimulate debate about the direction of technological innovation, or the relationship of technology and society; and I looked at the actions of grass-roots activist groups in South Africa, who help poor people to make illegal connections to water and electricity networks both as a pragmatic means of survival and as a visible protest against government policies, especially water privatization. These are the 'Radical Plumbers' referred to in my thesis title.

I also investigated the earlier history of first world design attention to the developing world, looking at the appropriate technology movement. This early history was markedly different to the most visible projects today: the appropriate technology movement was critical of mainstream economics and the exploitative relationship of the first world to the 'third world', and it aimed to give local autonomy to the poor in the developing world. The *PlayPump*, in contrast, was very much reliant on first world economies: PlayPumps International CEO Gary Edson cited the global financial crisis as a reason for the lack of uptake of advertising space on the *PlayPump*, for instance. As an example of a well-researched and highly successful appropriate technology, I focused on the Zimbabwe Bush Pump, a hand-operated water pump active in the same general Southern African region as the *PlayPump*, though it is several decades older. The *PlayPump* is often described as an appropriate technology itself, so it especially invites comparison with an object like the Zimbabwe Bush Pump.

The Zimbabwe Bush Pump was the subject of a paper by science and technology scholars Marianne de Laet and Annemarie Mol, in 2000, titled: 'The Zimbabwe Bush Pump: Mechanics of a Fluid Technology', and it is to this paper which the title of my own paper refers (de Laet & Mol 2000). In their paper, de Laet and Mol outline a number of ways in which the 'appropriateness' of the Zimbabwe Bush Pump is due to what they call its 'fluidity'. The Zimbabwe Bush Pump was first designed in 1933, in colonial Rhodesia, and has since undergone successive redesigns – its design was still being refined in 2000 at the time of de Laet and Mol's paper. This changing over time is one aspect of the pump's fluidity that contributes to its appropriateness – it is continually responsive and adaptive. It has been such a successful design in all its incarnations that it was the national standard hand-pump of both the Rhodesian and Zimbabwean governments. 18,000 of the pumps were produced just between 1987 and 1998. The pump is fluid too in its ability to be modified by users, and to continue working even when parts of it are broken or replaced by non-standard parts. One of the main aims in later design work on the pump has been to refine the hidden, 'down-hole' components of the pump so that they can be more easily retrieved and repaired by users without the use of heavy machinery.

One thing the Zimbabwe Bush Pump does not have is a large first world audience, beyond academics like de Laet and Mol, and workers in the water and sanitation sector, who very much admire the pump. This is because the main 'audience' for the pump is its immediate users: de Laet and Mol describe how the pump must 'seduce' the village

community around it into taking care of it, for without the support of the community, the pump will fail. This is another way in which the boundaries of the pump are fluid, in that they can be defined as including the people who use and must maintain it.

The *PlayPump*, in contrast, is not designed to be maintained by its users: where the Zimbabwe Bush Pump's open design invites modification, the *PlayPump's* water pump is sealed inside the roundabout, and can only be repaired by their contractors. UNICEF's report pointed out that because of this it contravenes many African countries' national policies regarding development projects; community involvement in maintenance is a well-established principle. The *PlayPump's* design has also not changed over time – all design modification happened at the very start of the project, when Trevor Field licensed the design for a prototype pump powered by a roundabout from a South African inventor, added billboards to it and somewhat modified the pump mechanism. It is my contention that the *PlayPump's* design cannot be substantially changed, because the success of the project relies not on how well it works for the user, but how well it communicates as an image to outside audiences, and it is this image that must be maintained. For this reason I refer to the *PlayPump*, in contrast to the Zimbabwe Bush Pump, not as 'fluid', but as 'frozen' or 'static'.

The *PlayPump's* success as an image relies upon the illusion it produces of goods achieved without labour, and on the inclusion of children in its operation. 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). PlayPumps International's slogan was 'Kids play. (period) Water pumps! (exclamation mark)', emphasizing the separation of these two concurrent actions. The system is presented as if children playing and water pumping are almost coincidental. As evidence of the successful uptake by audiences of this representation of the pump, we can note how frequently the *PlayPump* is referred to as 'magical' – our Minister for Water Affairs in South Africa referred to it in this way in parliament in 2003, and so have many other articles in the press. I've even read in one publication that the *PlayPump* is "known as the magic roundabout". In this way it joins a long tradition of magical objects that produce goods without human effort: salt-grinders, cooking-pots, axes and harps. Think of Mickey Mouse in *Fantasia* playing the Magician's Apprentice, with a magic broom to do his work for him. While these examples come from a European, specifically Germanic tradition, I suspect that the idea is common in other cultures too. The anthropologist Alfred Gell, in his classic text 'The technology of enchantment and the enchantment of technology', noted that "all productive activities" of the Trobriand islanders in the South Pacific, for example, "are measured against the magic-standard, the possibility that the same product might be produced effortlessly" (Gell 1992).

In its inclusion of children, the *PlayPump* brings an English-language metaphor to life: that of 'child's play': again, the evidence for this is in the abundant use of the term in press articles describing the *PlayPump*. "Why pumping water is child's play" was a headline on the *BBC News* (BBC News 2005); "Playing for real" a headline in the *Mail&Guardian* newspaper, South Africa (Bloom 2004); *The Sunday Times* in Britain described the *PlayPump* as "turning the arduous task of pumping from a well into child's play" (Lamb 2005). 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). Similar to its appearance as a magical object, it seems that the *PlayPump* as 'child's play' *plays* successfully on existing images in the Western imagination. And in depicting

children as the only intended users of the pump, the *PlayPump* makes sure that children are always part of its representation: as an uncomplicated image of need without responsibility for their circumstances, images of children are already a large part of publicity around development projects.

But what of the value of this communicative function, of the *PlayPump* as image? Part of what I've been doing with my research into similar communicative, multifunctional objects to the *PlayPump* is demonstrating an understanding of the value of attracting an audience's attention to social problems through objects such as these. 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). But what does the *PlayPump* communicate about the problem of water provision in the developing world? The design academic Anthony Dunne, who has done most to advance the idea of a 'critical design' practice, coined the term 'parafunctional object' to describe functional objects that communicate social issues. He outlines a role for design not as problem-*solving*, but as problem-*raising*. The *PlayPump,* however, is not truly a parafunctional object in these terms: it may raise awareness about the lack of clean water in the developing world, and efforts to provide it, but rather than providing insight into the problem, it only offers itself as the solution. Dunne warns against this: objects that claim to solve a problem, as the *PlayPump* frequently has done, risk communicating to audiences that the problem is already solved, and so does not require further inquiry: rather than being a critical design or parafunctional object, that interrogates and keeps *open* a social problem, objects like the *PlayPump* which exaggerate their benefits in fact *block* our view of the problem, closing down debate.

In conclusion to what has been a brief slice through some of the material in my PhD thesis, I wish to highlight the risks that objects like the *PlayPump* present when designed to solve very real and large-scale problems in the developing world. This is the larger frame of my work, which is referred to in my thesis title as 'Objects in development'. While there is a role for functional objects that are designed to communicate to distant audiences, we need to develop critical tools for understanding them, because they do not all work in the same way and are not all appropriate to the same circumstances. In inventing globalised objects for use in the developing world that rely on first-world audiences for their advancement, we risk privileging projects that excite our imaginations – and here I am talking about *us* as the relatively affluent, in whatever parts of the world – rather than projects that may not appear as sexy, but perform their work for the user more effectively. Uncritically engaging with Western audiences can mean that through a process of selection, projects that are the most effective at communicating to us will be most advanced. We need to continually touch back on the question of whose needs we are designing for. And we need to interrogate what we mean when we talk about innovation: the Zimbabwe Bush Pump is highly innovative, but it is innovation of a subtle and concealed type, which nonetheless has enormous implications for the user. We seem too hooked in the West on the broad brush-strokes, spectacular innovation of objects like the *PlayPump*.

Thank you for your time, and to my fellow panelists, and I look forward to sharing the results of my research with you soon. This presentation can be accessed on my website, at http://ralphborland.net/psi16, where you will also find my email address.

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