

Robot Reincarnation

Rubbish, Artefacts, and Mortuary Rituals¹

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Abstract

Beginning with a discussion of ingenious, and artistic, methods of disposing of 3/11 debris, I offer working definitions of rubbish, art, and artefacts, and show how refuse can be selectively recycled, recirculated, and even reborn. In Japan, funerals for computers and robots represent a new type of memorial rite. The expansion of Buddhist funerary rituals to include flesh-and-blood animals and robotic pets, among other non-human entities and artefacts, has a long historical precedent in Japan. Religion and religious organizations are, in part, a service industry: they provide services that adapt and respond to specific human needs and desires. These services can focus on fairly esoteric and spiritual needs, or provide very tangible rewards and benefits, or they can do both.

Keywords: robots, Buddhism, funerals, memorials (*kuyō*), recycling, triple disaster

¹ This chapter is an expansion of a talk I presented at the workshop 'From Garbage to Art', Leiden University, Leiden, the Netherlands, 7 November 2014, organized by Ewa Machotka and Katarzyna Cwierotka. I owe them both sincere thanks for a most stimulating event, and for shepherding this edited volume to completion. I am also grateful for the helpful comments I received from the workshop participants and members of the audience. I would also like to thank Fabio Rambelli for sharing with me a relevant new manuscript of his. Some of this material appears in my book *Robo sapiens japonicus: Robots, Gender, Family, and the Japanese Nation* (2017). Research for this chapter was supported by a John Simon Guggenheim Memorial Foundation Fellowship (2011-2012); an Abé Fellowship (Social Science Research Council, 2010-2012); and a Faculty Research Grant, Center for Japanese Studies, University of Michigan (2012).

Rubbish, art, and artefacts

How should we care for old robots? I wonder who would have ever imagined this kind of problem [with Sony's AIBO]? It's possible that the same dilemma will emerge ten or twenty years from now for Softbank's humanoid Pepper that debuted in June [2014].²

Rubbish is a human invention, a category of 'stuff' that is no longer useful. The stuff of rubbish consists of organic or inorganic substances and things that humans have made, consumed, and then discarded or destroyed in whole or in part. There are many synonyms for rubbish – trash, refuse, compost, junk, debris, litter, waste, scrap – all of which have differently inflected meanings, as well as associated actions and attached values. Thus, as an adjective, 'trash' as in 'trash talk', refers to offensive, insulting, boastful, and intimidating speech. 'Compost' suggests an ecological approach to disposing of organic matter, while 'litter' implies things that are carelessly discarded in places where they should not be. Natural forces can accelerate the production of rubbish, most recently evident in Japan in the mountains of debris following 3/11, the date notation for the 11 March 2011 trifold disaster (earthquake, tsunami, and nuclear meltdown).³ The word 'debris' thus implies the wreckage or destruction of a thing or building, the fragments of which constitute a particular kind of rubbish.

Rubbish disposal involves just as much ingenuity as the production of the stuff out of which rubbish is created. We might associate rubbish disposal with landfill or incineration, but disposed stuff can also be selectively recycled and recirculated. These processes are the livelihood of many groups of people around the world, such as the *catadores*, or rubbish-pickers, of Brazil, who are the subject of *Waste Land*, a 2010 film by Lucy Walker.⁴ Discarded

2 <http://matome.naver.jp/odai/2140655292741769801>, accessed 25 July 2015.

3 As of 2015, the data on the 11 March 2011 trifold disaster (earthquake, tsunami, meltdown) report 15,892 deaths, 6,152 injured, and 2,574 missing. Around 230,000 people have been relocated or are still living in temporary housing. See https://www.npa.go.jp/archive/keibi/biki/higaijokyo_e.pdf and <http://www.japantimes.co.jp/opinion/2015/03/10/editorials/tohoku-slowly-on-the-mend/#.VcdxZKbTHVs>, accessed 25 July 2015.

4 Filmed over a period of several years, *Waste Land* follows artist Vik Muniz as he travels from his current home in Brooklyn to his native Brazil. On the outskirts of Rio de Janeiro is Jardim Gramacho, at 321 acres the world's largest rubbish dump, where Muniz photographs an eclectic band of *catadores* at work. He then projects the images onto the floor of a cavernous warehouse and, using the enlarged photographs as templates, works with the recyclers to create portraits from assorted rubbish, which he then photographs anew (<http://www.wastelandmovie.com/>, accessed 25 July 2015).

stuff is a desirable medium for many artists. 'Rubbish or rubbish art' is regarded as a sub-genre of 'found-object art', which originated from the French *objet trouvé*, describing artwork created from objects or commodities not normally considered 'art'. In this connection, one may recall the work of avant-garde artists Marcel Duchamp (1887-1968), famous in part for signing and displaying as 'art' ready-made objects such as commodes and hat stands, and Nam June Paik (1932-2006), who refashioned ready-mades and discarded commodities into signed artworks, including robots. A recent iteration of 'rubbish art' by Japanese artists is exemplified by the late Tonoshiki Tadashi (1942-1992), who created what he called GOMI ART (sic), or 'rubbish art'. One of his largest installations of GOMI ART was included in the 2014 Yokohama Triennale. Titled *Yamaguchi-Nihonkai-Ninohama, Okonomiyaki: Complete Figure, Weight About 2 Tons* (1987), the piece is a gigantic compressed ball of generic rubbish and waste along with dirt and asphalt. Tonoshiki, who was born in Hiroshima and was indirectly exposed to radiation after the 1945 atomic bombing, sought to create art, including GOMI ART, that dealt with social issues, such as radiation disease and environmental damage.

In Japan, the removal and processing of rubbish and debris from 3/11 has proved to be especially vexing due to both legitimate and unfounded fears of contamination and toxic pollution. Even so, tsunami debris has become museum-worthy, as exemplified by the case of the Rias Ark Museum in Kesennuma, Miyagi Prefecture. Due to its elevated location the museum survived, untouched by the towering wall of black water that swallowed the neighbourhoods below; but it was damaged in the 9.0 earthquake that triggered the tsunami, and was forced to shut down for over a year. During this time the facility served as a refuge and distribution centre for suddenly homeless local residents. The museum staff set about documenting the disaster by taking hundreds of photographs and collecting found debris. A collection of these items, titled 'Records of the Great Eastern Japan Earthquake and the History of Tsunami Disaster', was added to the museum's permanent exhibition to tell the story of the disaster.⁵ Unlike Tonoshiki's balls of generic rubbish, this preserved collection of debris – newly excavated archaeological artefacts – memorializes the people and households of Kesennuma who had used these items in their everyday lives. They were things that had not been discarded by people, but that were violently wrested from them by the roiling tsunami. The Rias Ark Museum collection is thus a conjunction of the abstract and the concrete, the iconic and the indexical. In other words, each object both represents itself, and points to forces of destruction and

5 <http://rias-ark.sakura.ne.jp/2/>, accessed 25 July 2015.

to networks of family and community life that are usually invisible, in the sense of being taken for granted, until they are lost.

Tonoshiki's GOMI ART and the Rias Ark display of tsunami debris raise questions about the relationship between artefacts and art. Briefly, an artefact may be defined as an object that has been intentionally made or produced for a certain purpose. It thus follows that an artwork per se is characterized by its artefactuality – it is intentionally made for a purpose, usually its presentation and display to an art world public. Although a significant percentage of tsunami debris consists of artefacts, they were physically modified and dislocated by violent forces of nature. However, those on display were selected from among the extensive debris fields of Kesenuma and displayed by Rias Ark Museum curators who intentionally modified the tsunami artefacts, effectively turning them into objects of aesthetic appreciation that also served the purpose of memorialization.

Recently, professional and amateur artists alike have undertaken projects to utilize some of the 3/11 debris artefacts as an art medium and to create new art works. Among the former are Chim↑Pom, an artist collective of youthful social activists (one woman and five men) formed in 2005. The collective was among the 25 artists invited to participate in an exhibition on the triple disaster held from mid-October to early December 2012 at Mito Art Tower.⁶ Chim↑Pom contributed a ten-and-a-half minute video, *100 Kiai* (100 cheers), shot in Sōma, a small city in northeastern Fukushima Prefecture, about 28 miles from the nuclear reactors, that was inundated by the tsunami. The piece focused on empathic bonding and was not geared towards a critique of nuclear power, much less on the long reach of TEPCO's power and influence at all levels of Japanese society. As described by Chim↑Pom,

[w]e ad-libbed and cheered based on whatever we felt at the time, starting with 'Here we go!' to 'We're going to rebuild!', to there were things about radiation, to 'I want a girlfriend!' to 'I want a car!' Anything was OK.⁷

⁶ The collective's website is <http://chimpom.jp/>. The exhibition was titled *3/11 to aiteisuto: Shinkōkei no kiroku* (3/11 and artists: Chronicle of progressive form). I attended on 17 October 2012 and, generally speaking, found the exhibition long on expressions of sympathy for victims and short on both critical realpolitik and ethical critiques of the Tokyo Electric Power Company (TEPCO) whose corporate hubris and gross negligence was responsible for the tsunami-damage to the Fukushima Daiichi reactors and subsequent meltdown. Most recently, the Boston Museum of Fine Arts held a show (5 April–12 July 2015) titled *In the Wake: Japanese Photographers Respond to 3/11*.

⁷ <http://www.pbs.org/wgbh/pages/frontline/the-atomic-artists/art-cannot-be-powerless/>, accessed 25 July 2015.

Among the latter amateur artists is a group of children from Ishinomaki, a coastal city shredded by the tsunami, who took part in a project to create art objects out of tsunami debris (*gareki*). *Watanoha Smile* (2013), the catalogue of their work, makes an important distinction between things that are discarded by people because they are no longer needed, and things that remain very important to people but that were taken from them. The children collected household utensils, toys, tools, and equipment, and fashioned them into art objects as a way of restoring their value, meaningfulness, and agency. Two of the *gareki* art objects created by the children were identified as robots. An exercise in uplifting the hearts and minds of those whose lives were turned upside down in the fifteen minutes it took for the tsunami to turn houses into matchsticks, *Watanoha Smile* specifically avoided any mention of human culpability, much less corporate irresponsibility for the extent of the destruction.

Robots and rubbish: Consumption and disposal

Ironically, perhaps, these debris-art robots draw attention to the absence of robots at the damaged Fukushima reactors. Those robots that were later deployed inside the damaged reactors were rendered inoperable by the high levels of radiation and subsequently abandoned, or thrown away. At least one Japanese robot blog site discussed (in January 2013) the possibility of 'building a tomb where the [Fukushima] robots that could not return would be memorialized (*kuyō suru*)'. We have 'needle tombs' and 'needle *kuyō*', the blogger rationalizes, 'so I think it's a good idea to have the same for [the Fukushima] robots'.⁸

As I read this entry, I was reminded of the battlefield robot Scooby Doo, who was named after the Great Dane in an American animated TV series (1969–present) about a family and its big dog. Scooby Doo was used extensively in Iraq and Afghanistan to defuse domestic bombs and the especially lethal IEDs (improvised explosive devices). Unfortunately, the little tank-like robot was destroyed when an IED it was defusing suddenly exploded. Scooby Doo was damaged beyond repair and its human companions were left feeling bereaved. However, soldiers today often give their robots names and personalities, and 'promote them to titles such as Staff Sergeant, award them Purple Hearts, and even hold funerals for the destroyed devices that

⁸ <http://nobu-bookshelf.cocolog-nifty.com/random/2013/01/post-b916.html>, accessed 25 July 2015.

have assisted them on the frontline'.⁹ The remains of Scooby Doo are now on display at a museum in Bedford, Massachusetts, alongside a plaque dedicated to the robot.

When one googles the descriptors 'robots, trash and art', the vast majority of the vast number of links concern robots designed to serve as refuse collectors and recyclers. In this regard, the 2008 animated movie, *WALL-E*, comes to mind. The film stars a robot named WALL-E, who is one of a crew of identical robots designed to clean up an abandoned, rubbish-covered earth far in the future. The former human inhabitants long ago fled to an orbiting spaceship and their gluttonous and sedentary descendants are now morbidly obese. WALL-E, the lone remaining *catadore*-bot, has created a rubbish-art museum, where he preserves 'treasures' that bring him a little happiness amidst the ecological devastation left behind by the reckless consumerism of the former human residents.

An example of a real refuse-collecting robot is DustCart, an Italian humanoid that is a demographer, refuse collector, recycler, and pollution monitor all in one – and much quieter and cleaner than a diesel truck. This real-world, real-time WALL-E was introduced in 2010 to the hilltop Tuscan town of Peccoli, where the narrow, winding roads are difficult for refuse lorries to navigate. DustCart requests a personal ID number that identifies the user and tracks their household's rubbish as well as the type of rubbish being dumped: organic, recyclable, or waste. The *catadore*-bot can be summoned by a mobile phone or SMS to make a special pick up. Because it possesses artefactuality, in the sense described earlier, one could regard DustCart as a kind of mobile public art form with a practical purpose.¹⁰

There is a large body of literature available on fictional and actual rubbish-disposal and recycling robots and robotic equipment. Information about how robots themselves were disposed of, recycled, and transformed into art or other aesthetically endowed entities is more difficult to track down. But before I turn to an exploration of my main theme, robots and reincarnation, a short digression on the place and perception of robots in Japanese society today provides some necessary context.

Why robots, why now? The population, and labour force, of Japan is rapidly ageing and shrinking swiftly. The birth rate presently stands at about

9 <http://www.dailymail.co.uk/sciencetech/article-2081437/Soldiers-mourn-iRobot-PackBot-device-named-Scooby-Doo-defused-19-bombs.html>, accessed 25 July 2015. For detailed information on the fraternal and familial nature of soldier-robot relationships, see Carpenter 2013.

10 <http://www.treehugger.com/clean-technology/italys-trash-robot-is-a-real-life-wall-e.html>, accessed 25 July 2015.

1.3 children per married woman, and around 25 per cent of the population of roughly 127.3 million people (which includes about two million legal foreign residents) is over 65 years of age; that percentage is expected to increase by 2050 to over 40 per cent. The latest estimates produced by the Ministry of Health, Labour and Welfare (Kōsei Rōdōshō) project that the population will shrink to less than 111 million in 2035, and to less than 90 million in 2055. Briefly, women and men are postponing marriage until their late twenties and early thirties, and some are eschewing marriage – which is (still) the only socially sanctioned framework for procreation – altogether.¹¹ Even married couples are opting not to have children; today, house pets outnumber children, and companion robots sales are expected to take off. In June 2014, Son Masayoshi, founder and CEO of Softbank, the Japanese telecommunications and Internet corporation, unveiled Pepper, the 'emotional' humanoid robot in anticipation of a growing demand for personal robot companions.¹²

To cut a long story very short, the state is continuing the post-war trend of pursuing automation over replacement migration. Japan is neither an immigrant-friendly, nor an immigrant-dependent nation-state, despite an experiment in the 1980s to recruit South Americans of Japanese ancestry (Nikkeijin) into the labour force.¹³ Beginning several years ago, in connection with the economic slowdown associated with the persistent recession, Nikkei guest workers were paid to return to the continent. Ironically, the state is once again considering the recruitment of temporary guest workers, this time to assist with the considerable preparations for the 2020 Tokyo Olympics.

The corporate sector and government alike are banking on the robotics industry to reinvigorate the economy and to preserve the country's much eulogized ethnic homogeneity. Although the population of Japan arguably is more outwardly (phenotypically) homogenous than that of the United States or Brazil, there are many cultural-minority and marginalized groups,

11 The vast majority of 'single mothers' in Japan are women who are divorced or widowed.

12 See http://www.softbank.jp/en/corp/group/sbm/news/press/2014/20140605_01/, accessed 25 July 2015. Official estimates put the pet population at 22 million or more, but there are only 16.6 million children under fifteen (Evans and Buerk 2012). Softbank's Son Masayoshi has long been eager to enter the household robot market. Pepper retails for ¥198,000 (approx. €1,415). The robot is manufactured by Aldebaran Robotics, which has offices in France, China, Japan, and the US, and is 78.5 per cent owned by Softbank.

13 Brazil has the largest population of people of Japanese ancestry outside of Japan. The 1.5 million Japanese Brazilians are descendants of the mostly impoverished farm householders who immigrated to South America in the late nineteenth century with the support of the Japanese government. As of 2014, less than 2 per cent of Japan's population consists of immigrants and migrant workers (<http://www.ipsnews.net/2014/04/japan-seeks-foreign-workers-uneasily/>, accessed 25 July 2015).

from the indigenous Ainu to 'permanently residing' (*zainichi*) Koreans and Chinese. Not only are robots imagined to replace the need for immigrants and migrant workers, humanoids are being designed to fulfil many roles, including the preservation of 'unique' Japanese customs and traditional performing-art forms.¹⁴

The premium placed by the government on robotics as a techno-utopian solution to problems facing Japanese society today is clearly evident in Innovation 25, the central government's visionary blueprint for revitalizing Japanese society – and especially the household – by 2025. Since 2007, the Japanese state has actively and relentlessly promoted a robot-dependent society and lifestyle. In February 2007 then prime minister Abe Shinzō unveiled Innovation 25, a visionary blueprint for revitalizing the Japanese economy, civil society, and the 'traditional' household by 2025.¹⁵ A newly coiffed and rejuvenated Abe was re-elected prime minister in December 2012, after serving as prime minister for less than a year in his first attempt, and his plan to robotize Japan is back on the fast track.¹⁶ In June 2013, he announced that his administration is earmarking ¥2.28 billion (approx. €18 million) towards the development of urgently needed robots for nursing and care for the elderly.¹⁷ Robots are imagined to help stabilize the family and, by extension, the society, and to generate spin-off businesses that will reinvigorate the Japanese economy. Some of these emerging industries are optical and haptic devices, new synthetic and biocompatible materials, new types of batteries, software innovations, speech and face recognition technologies, telecommunications, and, very recently, weapons systems.

Thus far I have left self-evident the definition of 'robot'. The image that most people have of robots and their abilities comes from science fiction stories and movies, and the word itself first appeared in Czech littératureur

14 Randerson 2007. See also <http://rt.com/art-and-culture/art-japanese-robot-calligrapher-585/>, accessed 25 July 2015.

15 For more information on Innovation 25 and its socio-political context, see Robertson 2007. This proposal is accessible on the Cabinet Office website (<http://www.cao.go.jp/innovation/>, accessed 25 July 2015).

16 Innovation 25 was supported by Mr Abe's successors, although not as ardently. Political support for rescue and care robots has grown following the 3/11 disaster.

17 The robotic assistants will form an essential part of a plan to address the shortage of care workers in the country as well as nurturing new spin-off industries. Of course what is left unmentioned is why there is a shortage of care workers. Too few Japanese are interested in that low-paying occupation, and the government administers an unusually gruelling Japanese-language exam that has made it virtually impossible for well-trained foreign nurses and care workers (mostly from the Philippines and Indonesia) to pass and thereby find professional employment in Japan.

Karel Čapek's play '*R.U.R., Rosumovi Univerzální Roboti* (Rossum's universal robots, 1920), which premiered in Prague in 1921. The Czech word *robota* means servitude or forced labour. *R.U.R.* is about a factory in the near future where identical artificial humans are mass-produced as tireless labourers for export all over the world. To cut an even longer story shorter, newer model robots are provided with emotions, and, now able to experience anger at their exploitation, revolt en masse and kill all but one human, a traditional artisan who encourages one new-model couple to repopulate the world with their own kind! *R.U.R.* was performed in Tokyo in 1924 under the title *Jinzō ningen* (Artificial human). Čapek's graphic portrayal in *R.U.R.* of the end of bourgeois humanity at the hands of a violent robot-proletariat helped to shape Euro-American fears about robots that persist to this day. The dystopian play did not, however, compromise the largely favourable acceptance among Japanese of things mechanical, including robots, from the 1920s onwards. Since *R.U.R.*, the meaning of 'robot' has become closely associated with intelligent machines with biologically inspired shapes and functions, such as humanoids.

Actual robots are far less agile and far more fragile than their fictional counterparts. Of all the many definitions of 'robot' in circulation, I find the following one usefully comprehensive yet concise: a robot is an aggregation of different technologies – sensors, software, telecommunication tools, actuators, motors, and batteries – that make it capable of interacting with its environment with some human supervision, through teleoperation, or even completely autonomously. The different levels of robot autonomy influence the way that humans and robots interact with one another. To be called a humanoid, a robot must meet two criteria: it has to have a body that resembles a human (head, arms, torso, legs) and it has to perform in a human-like manner in environments designed for the capabilities of the human body, such as an office or a house. Some humanoids are so lifelike that they can actually pass as human beings; these are referred to as androids.¹⁸

Japan is the most robotized country in the world: not only do Japanese companies produce half of the global supply of robots, but they employ the biggest number (300,000) of the world's industrial robots.¹⁹ Over the

18 Unless noted, most of the background information on the robotization of Japanese society is drawn from Robertson 2007, 2010, and 2014.

19 According to the International Federation of Robotics (IFR) – whose secretariat is hosted by the VDMA, the German machinery association in Frankfurt, Germany – Japan was the second-largest market regarding annual sales, but it still has, by far, the highest number of industrial robots in operation: more than 300,000 units. It is the most automated country in the world. Japan is also the predominant robot-manufacturing country. In 2013, more than half of

past decade, increasingly sophisticated robotic appliances and carebots have been designed and enlisted to support the physical and social labour of Japan's shrinking nurse force, and also to help triage the care of senior citizens.

Unasked, however, is the question of what happens to ageing, damaged, defective, and inoperative robots. I came up with the topic and title of 'robot reincarnation' while contemplating what happens to defunct robots, especially personalized animaloids and humanoids, many of which today are equipped with advanced artificial intelligence. Is Scooby Doo an anomaly, or are robots on the battlefield and in Japan and elsewhere increasingly regarded as subjects of and for death rituals and memorials? In considering various methods of robot disposal, I will revisit the originary metaphor supplied by Astro Boy, arguably Japan's most famous and beloved cartoon robot.

When asked what inspired them to build robots, most Japanese roboticists cite the *Tetsuwan atomu* (Mighty atom, in English known as *Astro Boy*) manga and anime created by the late Tezuka Osamu (1928-1989). I also noticed that the roboticists I interviewed all had a picture or figurine of Astro Boy in their labs and offices. The story of Astro Boy provides several insights into my topic of robots and reincarnation, although my focus is on actual, and not fictional, robots. The boy-bot's story begins in the Ministry of Science (Kagakushō), headed by one Professor Tenma who has been trying to create a robot capable of human emotions. His son, Tobio, suggests that he build a boy robot. Ironically, Tenma's obsession with his quest keeps him from giving Tobio fatherly love. The son runs away from home and is killed in an automobile accident, whereupon the grieving professor creates a robot in Tobio's likeness. However, when Tenma realizes that the robot will never grow up, he develops an irrational aversion to him and sells the boy-bot to the cruel owner of a robot circus. Once the novelty-craving audience tires of Astro Boy, the circus owner throws the robot boy into a closet along with all the other discarded robots, where he is left to lose power and expire. Briefly, Astro Boy is rescued from the rubbish heap by another scientist, Professor Ochanomizu, who restores him to life. The professor later creates a robot family and dog for him. Astro Boy's new mission is to save Japan, the planet, the cosmos from criminals and other dangers.

the global supply of robots was produced by Japanese companies. See <http://www.ifr.org/news/ifr-press-release/global-robotics-industry-record-beats-record-621/>, accessed 25 July 2015 and <http://www.ifr.org/industrial-robots/statistics/>, accessed 25 July 2015.

Robot reincarnation

The disposal and reincarnation of Astro Boy parallels the fate of the robots created in the 1950s and 1960s by Aizawa Jirō (1903-1996), who was a close friend of Tezuka. Aizawa served as the first director of the Children's Institute for Cultural Activities (Nihon Jidō Bunka Kenkyūjo),²⁰ established in 1952 with the objective of making science fun for children. Dr Aizawa created 800 humanoid robot toys toward this end, and today, the Children's Institute sponsors various robot design competitions for young people. Aizawa's retro humanoid robots, built between 1950 and 1955, were showcased in the 1970 Osaka Expo, after which they were put into storage. They were restored to working condition by the Kanagawa Institute of Technology, Department of Robotics and Mechatronics (Kanagawa Kōka Daigaku, Robotto-Mekatoronikusugakka), and exhibited at the Japan Robot Festival (Japan Robotto Fesutibaru) 2009 in Toyama City, Toyama Prefecture. The restoration project used original parts where possible, though procuring working vacuum tubes among other dated components was a challenge. Fortunately, there are now many museums around the world that salvage, display, and sell old computers and robotic devices – again, demonstrating the overlap between artefacts and artworks. The retro-bots are now on tour, displayed in art galleries and museums around the country.²¹

In Japan, robot funerals, as a new type of memorial rite, have attracted attention. In 2014, a new web-based service was inaugurated that offers 'robot funerals' (*robottosō*). The splash page features an Aizawa-type robot. Advance notice of the service, distributed by AIBOFFICE Global Communications Partner, emphasizes that the existence today of so many pet robots regarded as family members calls for a proper funeral when their time has come.²² The case of AIBO, Sony's robot dog that was on the market between 1999 and 2006, is instructive. In 2006, AIBO was inducted into Carnegie Mellon University's Robot Hall of Fame, and praised as 'the most sophisticated product ever offered in the consumer robot marketplace'.²³ Sony stopped producing replacement parts for the robot dog in March 2014. The human companions of AIBO in Japan and elsewhere are not happy, and given the reality of their robot dogs 'dying' – that is, becoming

20 <http://www.robot-foundation.com>, accessed 25 July 2015.

21 Curiously, in Japan, the Nagoya Robot Museum (Robotto Myūjiamu), which was open for only a year between 2006 and 2007, included an exhibit called 'Dr. Aizawa's Workshop'.

22 <http://robotson.com/>, accessed 25 July 2015.

23 <http://www.robothalloffame.org/inductees/06inductees/AIBO.html>, accessed 25 July 2015.

inoperable and unfixable – A-FUN, a Japanese company specializing in the repair of defunct electronic devices, has recruited retired Sony engineers to oversee the rehabilitation of damaged or malfunctioning AIBO.²⁴ Robot dogs beyond repair are treated as ‘organ donors’; 180 ‘hospitalized’ AIBO are on the waiting list for body parts. A supervisor at the company emphasizes that ‘[f]or those who keep AIBOs, they are nothing like home appliances. It’s obvious they think their (robotic pet) is a family member’ (Suzuki 2015). In January 2015, nineteen AIBO that could not be restored to health and whose ‘organs’ would be harvested were given a funeral at Kōfuku-ji, a 450-year-old Buddhist temple in Isumi City, Chiba Prefecture.²⁵ The officiating priest explained that the AIBO *kuyō* was an occasion on which ‘the robots’ souls could pass from their bodies’. He also remarked that he ‘was thrilled over the interesting mismatch of giving cutting-edge technology a memorial service in a very conventional manner’ (Suzuki 2015). Kōfuku-ji belongs to the Nichiren denomination of Buddhism that focuses on the *Lotus Sutra*, according to which all beings, humans and animals alike, have the potential to attain Buddhahood, a topic to which I return below. The event attracted international media coverage and will likely bring much-needed revenue to the temple in the form of people seeking memorial services for their robot pets and other cherished electronic possessions. However, the AIBO funeral at Kōfuku-ji was not the first such memorial service for robots; I will discuss a much-earlier precedent in the following pages.

Meanwhile, shortly after Sony closed its repair service, the website *freakingnews.com* staged an art contest, inviting AIBO family and friends to submit photo-shopped images illustrating some of the ways in which the 150,000 remaining robot pets might spend their ‘retirement years’. The 25 winning graphics range from the dignified and profound to the ironic and downright silly.²⁶ Even decommissioned industrial robots have been reimagined and reassembled as artworks. Earlier, I noted how robots were fashioned out of tsunami debris. By 2011, mothballed assembly-line robots were being redesigned and recommissioned as decorative ornaments for homes, businesses, and parks. For example, their toxic elements removed, ‘robotic arms used for welding can be used as lamp holders or as a coat

24 <http://a-fun.biz/case.html>, accessed 25 July 2015.

25 An image of the AIBO *kuyō* at Kōfuku-ji, held in January 2015, can be found at <http://www.dailymail.co.uk/sciencetech/article-2968691/Funerals-held-ROBOTIC-dogs-Japan-owners-believe-souls.html>, accessed 25 July 2015.

26 <http://www.freakingnews.com/AIBO-Pictures--914.asp>, accessed 25 July 2015.

rest’.²⁷ In Japan, as we shall see, Buddhism has figured prominently in the disposal of robots, especially those attached to individuals and families.²⁸

The expansion of Buddhist funerary rituals to include animal pets and valued objects and artefacts has a long historical precedent in Japan. Earlier, in the context of the Fukushima disaster, I quoted a blogger proposing memorial services, or *kuyō*, for the rescue robots abandoned in the radioactive reactors. Memorial services are staged for any number of people and things in Japan, from deceased relatives to ‘inanimate objects that have been part of [people’s] lives in some especially intimate way’ (LaFleur 1992: 144), such as sewing needles, tea whisks, clocks, chopsticks, spectacles, dolls, calligraphy brushes, Buddhist household altars (*butsudan*), and even brassieres (La Fleur 1992: 145; Rambelli 2007: 212–16, 312 n3). Several decades ago, a cartoon in the *Asahi Shinbun*, one of the three largest daily newspapers, spoofed the ‘memorial-mania’ of the Japanese by showing a memorial service for lost golf balls (*bōru kuyō*) in progress at the edge of a lake (Satō 1985: 23). More profound are the memorial services for aborted or miscarried fetuses and stillborn infants (*mizuko*), characterized by a strong apologetic tone that does not necessarily translate into an anti-abortion position (Harrison and Igeta 1995: 90; LaFleur 1992: 146–50).

Since the beginning of the domestic pet boom in the 1990s, a growing number of Japanese pet owners consider their beloved pets family members during their lifetime and feel that they should hence be treated in death like a human. Increasingly, deceased pets are memorialized in Buddhist rituals. Cremation is now the preferred method of treatment and joint human-pet burials are gaining currency (Ambros 2010). Pet cemeteries, too, are becoming more visible in the urban landscape. One of the earliest and most famous pet graves in the sprawling Aoyama cemetery in central Tokyo is that of Hachikō (1923–1935), the loyal Akita. A bronze statue of Hachikō was erected in April 1934, but later melted down and recycled during the Second World War. Resculpted in 1948, the bronze dog is now a famous waiting spot in the southeast plaza of Shibuya Station.

The grouping of all of these objects and entities as worthy of ritualized memorial practices inheres in the absence, in Japanese religious traditions, of any ontological pressure to make distinctions between organic/inorganic,

27 <http://www.brighthubengineering.com/robotics/115664-dealing-with-decommissioned-industrial-robots/>, accessed 25 July 2015.

28 When industrial robots were first introduced in Japanese factories, in the late 1970s and early 1980s, Shinto priests performed ritual consecrations of the new ‘workers’ (Schodt 1990 [1988]: 210).

animate/inanimate, and human/non-human forms. On the contrary, they are all linked to form a continuous network of beings (Kaplan 2004: 6; Mori 2005 [1981]: 32). Shinto, the native animistic belief system, holds that vital energies, deities, forces, or essences called *kami* are present in both organic and inorganic, and in naturally occurring and manufactured entities alike. Whether in trees, animals, mountains, or robots, these *kami* (or forces) can be mobilized.²⁹ Similarly, as roboticist and Buddhist scholar Masahiro Mori underscores in his thought-provoking book *The Buddha in the Robot*, not only are humans and machines 'fused together in an interlocking entity' but 'robots have the Buddha-nature within them – that is, the potential for attaining Buddhahood'. Mori also invokes a Buddhist robo-ethics, arguing that engineers who recognize that a Buddha-nature pervades them as well as their robots are able to design 'good machines [...] for good and proper purposes' and thereby 'achieve harmony between humans and machines' (Mori 2005 [1981]: 13, 179-80).

As Fabio Rambelli details in his book *Buddhist Materiality: A Cultural History of Objects in Japanese Buddhism* (2007), Buddhism has developed a sophisticated philosophy of materiality, addressing the status of material objects and their role in the quest for salvation. Briefly, the realm of material desires is not simply an obstacle for spiritual pursuits; materiality also provides a space for interplay in which human beings can give shape and expression to their deepest religious and spiritual ideas (Rambelli 2007: 268). Thus, memorial services, or *kuyō*, for non-human, non-animal entities and objects offer a powerful emotional and aesthetic experience of identification and affinity with intimately familiar things that are no longer functioning or useful, but that cannot simply be thrown away. This is certainly the case where the memorial service involves the on-site cremation of burnable objects. The fire ritual pacifies, purifies, and liberates the indwelling spirit (*kami*) of a given thing and insures its repose and its human guardian's solace. However, robots and other high-tech electronic devices are manufactured from a wide array of materials that are either or both valuable in themselves and best salvaged – such as gold, silver, lead, and copper – or toxic, and would release poisonous gases if burned out in the open. Therefore, another type of memorial service is necessary for them.

In a precedent-setting move, Banshō-ji, a temple founded in the mid-sixteenth century, staged the first 'computer *kuyō*' in May 2002. The event was referred to as the *pasokon kuyō* (personal-computer memorial service)

29 An informative analysis of the relation between manufactured goods and *kami* is Swynedouw (1993:55-60).

and also as *dennō kuyō* ('electric brain' memorial service). Banshō-ji is located in the Ōsu electronics district of central Nagoya, and the media-savvy head priest is also the CEO of a software company. Significantly, one of the attractions of the temple is the daily performances of *karakuri ningyō*, or mechanical dolls, created in the Edo period (1603-1867). Described as Japan's earliest robots, the animated clockwork dolls are indicative of a historical cultural premium on technologies of 'infotainment', and, significantly, *karakuri* originally referred to wind-up devices created to delight and amaze audiences.³⁰

Banshō-ji's 2002 computer *kuyō* was televised. A diverse assortment of desktop computers, laptops, and printers had been stacked in a row across the main altar along with vases filled with tastefully arranged flowers identified by donor. A collective memorial tablet (*ihai*) stood in the middle of the altar flanked by offering trays stacked with oranges and packaged goods. Incense wafted from an urn placed in front of the altar.³¹

The 30-minute mortuary rite began at 1:00 p.m. with the priest intoning the names of all the owners whose equipment was being memorialized. Afterwards he chanted a sutra. Rambelli notes in this connection that, '[e]specially in contemporary Japan, [...] [t]he use of sutras is often considered simply as an activity defined as *arigatai*, a term meaning something valuable, blessed, edifying, uplifting – something to be appreciated and thankful for'. Like the staging of the computer *kuyō* itself, the chanting of sutras functions as a 'liturgical implement' employed to create a 'Buddhist' ambience (Rambelli 2015: 24).

Following the service, the ritually marked computers were removed by the Banshō-ji staff to a recycling centre, where their component parts were separated out. Two years earlier, Nagoya had instituted a very strict recycling programme that required homeowners to separate household waste into several categories. Computer and electronic devices were to be collected once a month, but persons wanting to dispose of them first needed to notify the city hall and obtain a certificate of permission. Many homeowners felt this to be an inconvenient system. Banshō-ji stepped in to provide discommoded residents a practical and pragmatic service in the form of mortuary rites for their electronic commodities. For a ¥1,000 (approx. €9) memorial fee, the temple staged a *kuyō*, obtained the permits, and oversaw

30 <http://www.allonrobots.com/karakuri-ningyo.html>, accessed 25 July 2015. The different functions performed by the dolls include archery and serving tea.

31 Images of the computer *kuyō* at Banshō-ji, held in May 2002, can be found at <http://pc.watch.impress.co.jp/docs/2002/0513/osu.htm>, accessed 25 July 2015.

the recycling process. Computer users were able to pay their respects to their 'electric brains', and Banshō-ji was able to underscore the resilience and relevance of Buddhist funerary rituals in a highly technologized society.³²

In a recent article, Rambelli demonstrates how Japanese Buddhism incorporates and promotes technological developments, such as the low-tech 'robot monk' of Hōtoku-ji (Kakogawa City, Hyōgo Prefecture) and the multilingual, multi-denominational 'robo-priest' at a Yokohama funeral chapel. Personal computers can also be used to register with websites, such as Netto Nōkotsudō (Internet Crypt), that provide users images of their household's ancestral memorial tablets (*ihai*) accompanied by recorded sutra chanting, and also slide shows of their deceased relatives (Rambelli 2015: 15-16). The intimate, familial, and otherworldly connections enabled by the personal computer have imbued that device – along with personal robots, most of which can access the Internet – with especially profound signification, thus warranting their own *ihai* and special funerary ritual and memorialization.

Compare Banshō-ji's and Kōfuku-ji's communitarian ceremony to the distinctly non-religious, non-aestheticized method of disposing Roomba, the vacuum cleaner robot made by iRobot, an American robotics firm. On its website, ProTech Robotics, a leading global supplier of parts and accessories for Roomba, the company posts the following instructions to individual owners:

How to 'Green' Ownership of a Roomba or a Scooba.

We all love our roombas and scoobas and would never consider going back to a[n] upright vacuum or a mop and wringer. So how do we live responsibly, green and own a robotic appliance? The average roomba/scooba uses 7-9 lbs of plastics, 1lb of various metals, holds approximately 60ft of wiring and runs on a rechargeable NiMH, NiCD or Li-ion battery cells pack. The batteries used in a roomba or scooba are usually nickel-cadmium (nicad), lithium ion, or nickel-metal-hydride (NiMH). Nicads are good batteries, but the cadmium in them is toxic. [...] Customers are welcome to ship in their old Roomba Scooba or Robotic Appliance to us for responsible disposal. We will recycle all the metals, copper and circuitry and dispose of the non-recyclable parts, components and materials in accordance with our local recycling laws and county ordinances.³³

³² <http://www.banshoji.or.jp/> and <http://pc.watch.impress.co.jp/docs/2002/0513/osu.htm>, accessed 25 July 2015.

³³ https://www.protechrobotics.com/environmentally_friendly.php, accessed 25 July 2015.

One robotics company, Innvo Labs, a privately owned Chinese company based in Hong Kong and Nevada, has pursued the possibility of the reincarnation or re-embodiment of its robots. The robot in question is PLEO (Personal Life Enhancing Organism), a robo-dinosaur designed to emulate the appearance and (imagined) behaviour of a week-old baby *Camarasaurus*. The latest iteration, the PLEO rb (for 'reborn'), was released in December 2011. Like the original PLEO, the incarnated robo-dinosaur is popular in Japan, where it is distributed by Brulé, Inc.

PLEO rb is similar to the original PLEO: 48 centimetres long, 18 centimetres tall, and 1.6 kilograms in weight. However, no two of the reborn units are exactly alike. Each PLEO rb comes with randomly selected eyeballs, eyelids, and eye-shadow colours. Their skins are slightly different hues of green, although a special line of pink and blue PLEO rb were released in late 2012, ostensibly to target girls and boys (and in the process reinforce colour-based sexism). PLEO rb has more senses than its ancestor. It is animated by artificial intelligence, which enables the robo-dinosaur to learn from its human companions and from other PLEO over a life cycle ranging from birth to adolescence. Moreover, this information is remembered, allowing a given PLEO rb to develop a personality, guiding its future behaviour and interactions with its environment.

Innvo Labs employs the theme of reincarnation. Not only does PLEO rb represent the rebirth of an early model, but a malfunctioning PLEO rb can be reincarnated. The company instituted a new programme aimed at softening the blow of the loss of a beloved robo-dinosaur called the PLEO Reincarnation Program. If PLEO rb's human companions find that their robo-pet has developed a critical hardware problem after the 90-day warranty period, they can exchange it for another one at a reduced price. The unique part of the programme is that the PLEO rb's learnings will be uploaded into the new unit, effectively transporting the old robo-pet's personality into its body reincarnate.³⁴

The computer memorial service at Banshō-ji and the AIBO funeral at Kōfuku-ji strongly underscore what scholars of Japanese Buddhism have pointed out: that religion and religious organizations are, in part, a service industry; they provide services that adapt and respond to specific human needs and desires. These services can focus on fairly esoteric and spiritual needs, or they can provide very tangible rewards and benefits, or all of the above. In the case of Banshō-ji and Kōfuku-ji, persons who entered their

³⁴ <http://xn--zcka2g9caj9i.com/articles/10>, accessed 25 July 2015; http://www.PLEOworld.com/PLEO_rb/eng/lifeform.php, accessed 25 July 2015.

personal computers and AIBO in the mass *kuyō* were able to eulogize and memorialize technological entities of profound personal significance and to take advantage of the associated recycling and, in the case of AIBO, 'organ' donation services. The temples gain income, media exposure along with an updated reputation, and a new clientele.

Another religious connection to recycling is suggested by the PLEO Reincarnation Program, although it has no explicit connection to religious practices. There is a large and complex body of literature on the concepts of rebirth and reincarnation in Japanese Buddhism, both folk and institutional, coverage of which is beyond the scope of this chapter. Many scholars point out key differences between reincarnation and rebirth. Reincarnation, which is central to Hinduism, refers to the transmigration of one's eternal self or immortal soul to another body or fleshly host. The level of reincarnation, whether as a human or non-human animal, depends on the karma accumulated over the lifetime of the deceased. Buddhists refer instead to rebirth, defined as the continuity or consolidation into different forms of one's physical and mental energies after death. The concept of reincarnation does not fit within the Buddhist Law of Impermanence, which teaches that one's current self is transient and that there is no immortal soul that can transmigrate to another body.

However, as religion scholar Horie Norichika reports, based on his ethnographic research, since the 1980s many Japanese who identify as Buddhists express a belief in reincarnation as a means of continued individual or personal growth and improvement. They believe that reincarnation allows them to fulfil a mission not accomplished in this (or a single) lifetime. Such ideas are antithetical to the traditional Buddhist view of reincarnation as a source of egoistic suffering, and represent the emergence of a 'new age' Buddhism (Horie 2014). In this connection, anthropologist Fabienne Duteil-Ogata also documents how new technologies, such as 'close-at-hand cinerary objects' (*temoto kuyōhin*) consisting of small accessories made from the ashes of the cremated deceased, and environmentally friendly 'virtual graves' or 'grave computers' (*dennōhaka*, lit. 'electric-brain graves'), have introduced funerary forms that focus on living individuals: 'emotional bonds replace the rules of affiliation' (Duteil-Ogata 2015: 234-41).

Mortuary rituals that commemorate and memorialize one's personal belongings, including computers and robots, also highlight the tenacity of the animistic thinking central to Shinto coupled with the adaptability of Buddhist rituals. Exemplified by Kōfuku-ji's AIBO *kuyō*, the latter includes the re-embodiment of robots and signals the emergence among Japanese of a post-humanist Buddhism in which reincarnation is understood as a means of extending the non-transient self or soul in order to complete a yet

unrealized mission in this life – a mission that, if Innovation 25 prevails, will be facilitated by robots of all stripes. It is not implausible to imagine that, in the not too distant future, human-robot burials will prove to be as popular as human-animal pet funerals are becoming today.

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