Chapter 4

Digitalising Trauma's Fractures:

Nagasaki Museums, Objects, Witnesses, and Virtuality

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The Atomic Bomb Museum in Nagasaki is located less than 1km from Ground Zero where the United States Army Air Force detonated a second atomic bomb just a few days before the end of World War II on 9 August 1945 (Figure 1). It commemorates immense tangible and intangible losses for this place. The United States Army exploded a plutonium fuelled atomic bomb nicknamed 'Fatman' above the northern suburb of Urakami at 11:02am on 9 August 1945. Due to considerable cloud-cover and a lack of fuel, the pilots released the bomb not above the proposed city target, but earlier. Exploding roughly 500 metres above

***Figure 1**. The Nagasaki Atomic Bomb Museum, Fredrik Rubensson, Creative Commons, April 7 2012.*

the Urakami valley, a northerly suburb of Nagasaki, the bombing exerted a force equivalent to 22,000 tons of TNT (Kort 2007, p. 4). This was the second of two atomic bombings of cities in Japan: events which definitively altered the course of world history. Whether or not the bombing were decisive for the final stages of WWII, there is little doubt the atomic explosions defined the nature, and the fears central to the following Cold War. Culturally, socially and politically, the Nagasaki Atomic Bomb Museum narrates a unique trajectory – that is often compared to the museum in Hiroshima, the city bombed three days before – yet, Nagasaki has been much less discussed in existing academic literature. What sets the narrative of the bombing of Nagasaki apart from that of Hiroshima is how the centre point of the bombing demolished a much

more marginal, less developed part of the city, fracturing social, cultural, and economic life and resulting in deep trauma in a city that was already divided (McClelland 2019a, p.3-14).

Narrating 'cultural trauma': unknowable truth and the memorial museum

The atomic bombings of Nagasaki and Hiroshima in war are key points of cultural trauma in the twentieth century that signalled the beginning of the nuclear age. For Jeffrey C. Alexander cultural trauma should be understood as distinct from individualised trauma: "members of a collectivity (*sic*) feel they have been subjected to a horrendous event that leaves indelible marks upon their group consciousness" (Cited in Marcoń 2011, p. 788). Representing such trauma collective in a museum space, virtual or material, requires an attentiveness to the place, in this case Nagasaki; to the people who experienced this event (those who died and those who survived[1]); to the visitors who arrive in the museum to view and understand; and, to the memory and evidence that remains about the event. For those attempting to communicate collective trauma digitally, the question must be asked: what is the intended result for visitors to these spaces? The open nature of the displays will likely lead to a similar poignant question to the one put to students by a teacher after visiting the Holocaust-based Museum of Tolerance in the United States: "If this doesn't change our behaviour, what is the use of learning all this stuff?" (Reading 2003, p. 82).

Before attending to the purpose of the museum, it should be noted that trauma itself is essentially "unknowable truth", for both sufferer[2] and listener

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1 The dead (up to 70,000 in the first five months in the case of Nagasaki) are themselves a limitation on the telling of the narrative whether in the physical or the virtual museum space. The vanquished cannot tell their perspectives, stories, or experiences. We are limited to the evidence of their bodies left behind (in some cases), who talked about their experiences.

2 More than in my previous work, in this chapter I intend to avoid using the word 'survivor'

(Torchin 2012, p. 6). Transmitting a presumed 'reality' of the event of the atomic bombing is not sufficient. Just as scholars suggest there is more than one Jewish Holocaust[3], similarly the event of the atomic bombing of Nagasaki may not be singularised. Philosophically, the Nagasaki Atomic Bomb Museum itself presents such an aporia to the public audience. There is an impossibility of presenting any total truth about what happened. The memorial museum teaches about a history, without a clear beginning and end – so the museum and therefore any virtual museum must testify to the fractures; to a vanishing; and incomplete. Still, there remains a potential educative purpose. Additionally, by the opportunity to witness to the event, the sufferer may realise "a modicum of voice, perhaps even an attenuated sense of agency" (Sarkar and Walker 2009, p. 17).

Within this chapter I will evaluate the still unfolding evolution of digital resources in the case of museum and archive practice related to Nagasaki and their suitability in assisting in the task of teaching the difficult history of the atomic bombing, while the above aporia is front of mind. Memorial museums do exist to convince, and to assist the public in recalling public and collective trauma. Such museums were established in Nagasaki (and Hiroshima) specifically to convince the public of the necessity to avoid any repetition of such an event in the future. I raise here the possibility that digital techniques offer apposite methods that potentially reflect the fractured and incomplete nature of memory that supports the work of historiography (Williams 2012). In displaying a traumatic subject whether through physical objects, or the digital, an ongoing contest between the narrative and

as I am aware of the intrinsic struggle for many who come through difficult historic events to find agency. In having the privilege of talking with the second generation, I have noted a reticence to use the word 'survivor' to describe their parents. Thus, in this essay, I employ instead the word sufferer, avoiding the hoisting of an identity on any person who suffered such an extreme event.

3 Anna Reading reiterates James Young's argument that "in every country's memorials, in every national museum and archive, I found a different Holocaust and at times I found no Holocaust at all" (Reading 2003, p. 81).

the fragmentary is apparent – and the ultimately un-knowable story is told by fragments displayed or represented. The basis of the discussion in this chapter is my own extensive fieldwork involving multiple visits to the Nagasaki Atomic Bomb Museum between 2008 and 2019, supported by references within the literature, and my communication including emails to local public historians. Additionally, the work depends upon my analysis of emerging digital representations of the narrative of the bombing of Nagasaki. My wider work as historian in Nagasaki has involved extensive oral history interviews over many years with multiple sufferers of the bombing including the Catholic community, resulting in my book length monograph about their experiences, *Dangerous Memory in Nagasaki: Prayers, Protests and Catholic Survivor Narratives* (McClelland, 2019a).

I will develop my argument by introducing the evidence of the increasing digitalisation of the physical museum and comparing such components to two fully digital spaces that explicate the narrative of あの日*ano hi* ('that day'), 9 August 1945. Characteristics of the museum and the digital platforms include their methods of mapping the impacts, qualitative differences in prioritisation of sufferer voices, images and videos, and the memorialisation of damages and objects left behind by the bombing. As research question I evaluate to what extent objects and witness testimony in memorial museums have been enhanced, or stand to be enhanced by the digital in the Nagasaki context. I argue that emerging digital tools can potentially support, enhance, and expand our capability to conceptualise the historiography of the atomic bombing, although this is not a given (Cassidy *et al.* 2018). New forms of representation continue to evolve, representing memories, space, people, natural features, stories, and what was lost, within the Atomic Bomb Museum, and on the virtual platforms that will continue to transform how this event is curated, narrated, interpreted, and observed.

The museum 'object' traditionally points to the event within a memorial museum (Biedermann 2021). What does this mean for the evolution of

the digital object, and digital platforms which wholly or partially replace the physical building of the museum? There are two digital representations of the story of the atomic bombing I will describe in this chapter including the online Nagasaki アーカイブ *Aakaibu* (Archive), and the Nagasaki Museum on the Google Arts and Culture platform. The Google Arts and Culture site evolved with a close relationship to the physical museum site, whereas the Nagasaki Archive evolved separately, albeit with a similar aim to that of the museum of enabling people to understand more fully the story of the bombing. As I will note, the Nagasaki Atomic Bomb Museum today has a relationship with both digital sites. The Nagasaki Archive combines academic expertise with civic volunteerism. Hidenori Watanave 渡邉 英徳, an information technologist and engineer from Tokyo Metropolitan University was the main driver and originator of the site.

Objects Pointing to the Absent

When visitors enter Nagasaki Atomic Bomb Museum in Urakami, northern Nagasaki, they encounter multiple found objects on display. The Museum has been filled for many years with such semiotic objects that testify to the power of the atomic bombing, fractures created by the trauma of the bombing, and the state of the aftermath (see also Tang 2005; Reading 2003, p. 71). One scholar discussing the aim of the Hiroshima Peace Museum that similarly has been well-known for objects representing the destruction of the bombing suggests the items displayed must "embody the reality of the horrific effects of the atomic bombs" (Higashi 2018; See also Lowe et al. 2017). But this comment paradoxically suggests that the narrative is best conveyed by an embodiment of broken objects, whereas we might argue the objects do not embody the reality of the bombing. The event of the bombing in fact destroyed, maimed, and vanished bodies of all types, human, animal, and concrete. Therefore, displayed fractured objects operate as powerful symbols (Williams 2007): they subtly point to the terror of the bombing, but the story told is not of what the objects are, but more

often what they represent –the non-embodied; and the no longer visible – that was destroyed, pulverised, atomized on 9 August 1945.

A Short History of the Nagasaki Atomic Bomb Museum

The forerunner to the Nagasaki Atomic Bomb Museum was the International Cultural Hall (国際文化会館 *kokusai bunka kaikan*) in the Peace Park (平和公園 *heiwa kōen*, formerly Atom Park, アトム公). This building was erected by city authorities in the Urakami Valley as part of reconstruction efforts in 1955 (Diehl 2018, p36-40). Nagasaki itself was designated a

Figure 2*.*
Overhead photograph of Nagasaki, prior to the atomic bombing taken by US forces, 1945. Nagasaki Atomic Bomb Museum display. Photograph by the author, November 2019

"City of International Culture" in 1949, and therefore, the Cultural Hall was intended as a part of this international culture (Diehl 2018, p1). Incidentally, the Nagasaki International Cultural Hall attracted 220,671 visitors in its first year compared to 115,369 people who visited Hiroshima's Peace Memorial Museum (Diehl 2011, p109). As time wore on, by the time of the Tokyo Olympics of 1964, many tourists travelled on the bullet train to Hiroshima, without travelling further afield to Nagasaki (Nelson, 2002, p. 157). Later, in 1994, the Nagasaki Atomic Bomb Museum superseded the International Cultural Hall, and by its location alongside the Peace Park incorporated the hypocenter (Ground Zero) of the bombing. Pre-COVID, large numbers of visitors from outside Japan visited the Nagasaki Atomic Bomb Museum each year. (Ten million visitors had visited in total by 2008, composing c.72, 000 visitors per year). Within the Nagasaki Atomic Bomb Museum (**原爆資料館** *genbaku shiryōkan*) and the Cultural Hall displays, fractured retrieved objects from the devastation which represented the aftermath of the atomic bombing have been ubiquitous since 1955, while witness records have gradually increased as the displays evolved to become more influenced by digital technologies.

Museum Matters: From *Jitsubutsu* (objects) to virtual displays

In its modern iteration since 1994 the Museum includes permanent exhibition rooms, special exhibition rooms, a bookshop, conference hall, 'Peace study rooms', a library, a resting place and tearoom. In the permanent exhibition, visitors to the Museum are guided firstly into Exhibit A (Figure 3), then on through to Exhibit B, C and D. Museum curators believe that supported guidance and self-direction, ultimately allow the visitor to make up their own mind about the 'truth' of the narrative on the basis of their experience of visiting, observing, learning and interacting.

Exhibit A transports the visitor back to Nagasaki on August 9, 1945, with an overhead photograph of the Urakami valley prior to the bombing, taken by

Figure 3. *Exhibit A: Nagasaki Atomic Bomb Museum, Roland Woan, Creative Commons, April 28 2012.*

US forces (Figure 2), and a wall clock, frozen-in-time at 11:02. Here there is a mix of objects and digitalisation. Video and digital imagery are superimposed on 実物 *jitsubutsu* (realia), and the emblematic ruins of the church on the far wall is a replica. Additional digital images of the region prior to the bombing are flashed on large screens, and a short film of the rising mushroom cloud after the bombing of Nagasaki is screened.

Exhibit B "reproduces the tragic state of Nagasaki immediately after the bombing" (English language pamphlet from the Atomic Bomb Museum) including multiple eclectic 実物 *jitsubutsu* such as a broken water tank, melted rosary beads, a charred lunchbox and a grotesque helmet, incorporating the remains of a skull. Continuing through Exhibit B, the curators emphasise the witnesses of the atomic bombing, their statements, drawings, photos and videos. In Exhibit C, as well as a very short description of the aggressive war of Japan in China and the Pacific, the curators acknowledge the bombing's wider context and the

Figure 4. *Preserved atomised soap display, Nagasaki Atomic Bomb Museum. Photograph by the author, November 2019*

dawn of 'The Nuclear Age'. The display here connotes a history of ongoing nuclear weapon development, including a survey of the numbers of nuclear tests conducted and information on the ongoing development of modern nuclear weapons (Nagasaki Atomic Bomb Museum leaflet). Finally, Exhibit D is intended to be a highly interactive space. Here, one finds a computer-based quiz and a Video Room where visitors can watch an A-Bomb documentary.

The museum acknowledges the events leading up to the atomic bombings, emphasising the aggressive war of Japan in Asia (this emphasis was protested by some nationalistic right-wing groups upon the new building's opening in 1994) and acknowledging the foreign (被爆者 *hibakusha*) sufferers of

Figure 5.
Robes of a Buddhist monk, Nagasaki Atomic Bomb Museum. Photograph by the author, November 2019.

the bombing (Korean and Chinese internees, Dutch, American, British and Australian POWs). The museum acts as a place of study, for engagement with historical and ethical learning about contemporary society and culture. The digital supports the material displays, as I will discuss shortly (Minear 1995, p. 362).[4]

4 A refurbishment of the museum in 2015 increased the digital content in each exhibit, although some areas are digitally richer than others. There is no mobile app on offer at this museum, or tablet computers, but there are audio guides and small players with earphones available for visitors in Japanese, English, Chinese, Korean, Spanish, Portuguese (Portugal/ Brazil) Dutch, German, French, Russian, and Arabic (according to the museum website). The provision of translation is a significant advantage for the museum's educative aims.

Figure 6.
Tactile brass sign saved from the aftermath of the bombing from "Ohashi" bridge, Nagasaki Atomic Bomb Museum. Photograph by the author, November 2019.

Before introducing the digital aspects, though, there are multiple artefacts, replicas, a tree-trunk, photographs and artworks on display in the physical museum. Is it possible that the ubiquity of these items in the physical museum deny philosopher Alain Renaud's claim that due to digital advances, "solids [...] are now losing, if not all presence and power within society, then at any rate all regulatory cultural authority" (2002, p. 13). The objectivised environment of the museum as reflected in the objects on display in Nagasaki is a reflection of the conservatism of this institution and its origin in scientific rationalist, enlightenment epistemology. When I visited in 2019, one of the object displays showed preserved atomised cakes of soap on

which the brand-name 'Nissan' is visible in Japanese (Figure 4), and another the robes of a Buddhist monk (Figure 5). These are items recognisable for their human uses but displayed without their users. Seeing these material items encourages visitors to imagine those who used them or wore them.

Elsewhere, a brass sign from a bridge is accompanied by a museum sign encouraging visitors to touch. The tactile use of the brass sign including Japanese characters and a buckle allows visitors to personally feel the results of the atomic blast on the metal, a sensation that is preposterous in a virtual space (Figure 6). If the power of the bomb created a crucible to alter metal like this, we know on human skin, or softer materials, it would have incinerated. Again and again, the objects in Nagasaki's museum point to what is no longer there – the absent – and this anamnesis, or pointing to what is no longer, offers significant possibilities for the digital. How, then, can the digital offer an enhancement of our understanding of the traumatic narrative?

Displays have been increasingly digitalised within the physical museum. The previous Director of the Nagasaki Atomic Bomb Museum 中村明俊 Nakamura Akitoshi[5] kindly responded to me in an email exchange early in 2020, after I met him in late 2019 at the 'Atomic bomb studies group' in Nagasaki city. I asked him about how digitalisation augmented the three-dimensional objects traditionally displayed at the museum. Nakamura described to me the aims of a recent renewal of the Museum in 2015 while he was the director. This, he wrote, was an opportunity to expand the digitalised materials on offer, to improve the resolution of imaging and to achieve "a good balance with realia ('実物 *jitsubutsu*)'". The aim of digitalising was to improve the experience of visitors entering the museum. It offered an opportunity to translate a symbolic object for ongoing interpretation,

*5 Nakamura is a celebrated author (Akutagawa Prize 2001; TanizakiJun'ichiro Prize 2007) of short stories and fiction within Japan, with the pen-name,*青来有一*Seirai Yuichi.*

enhancing the public's intrinsic engagement with such items. By picturing concrete objects on the Nagasaki Museum website such objects' trajectory is expanded and the potential observing audience increased.

He wrote to me in an email as follows:

> 実物の資料とのかねあいを考えながら、今後はさらにデジタル技術の活用が進められていくと思います。そのとき、実物をさらにわかりやすく、当時の状況を伝えるためのデジタル技術も必要になると考えています
>
> (Email 10th January 2020)
>
> [I believe in thinking about balancing the materiality of the actual object (jitsubutsu), looking ahead we must more and more promote the practical use of digital techniques. As we do so, digitalisation must tell of the true situation of the time [of the bombing], making the objects easier to understand.]

Nakamura returns to the narrative of the bombing (the true situation), and as a fiction writer himself, he understands the importance of the work of the museum to transform objects through pluralistic, educative stories.

The purpose of the Nagasaki Atomic Bomb Museum

As I have argued, however, if the purpose of the Nagasaki Atomic Bomb Museum is to convey the truth of what happened, then it must point not to embodiment, but to the effects of the bombing of disembodiment and atomization. The purpose here is differentiated from nineteenth century museums which tended to remember the past while looking forwards to a glorious future. The Nagasaki memorial museum like others of the twentieth century, comes to terms with violence, oppression, and genocide (Sodaro

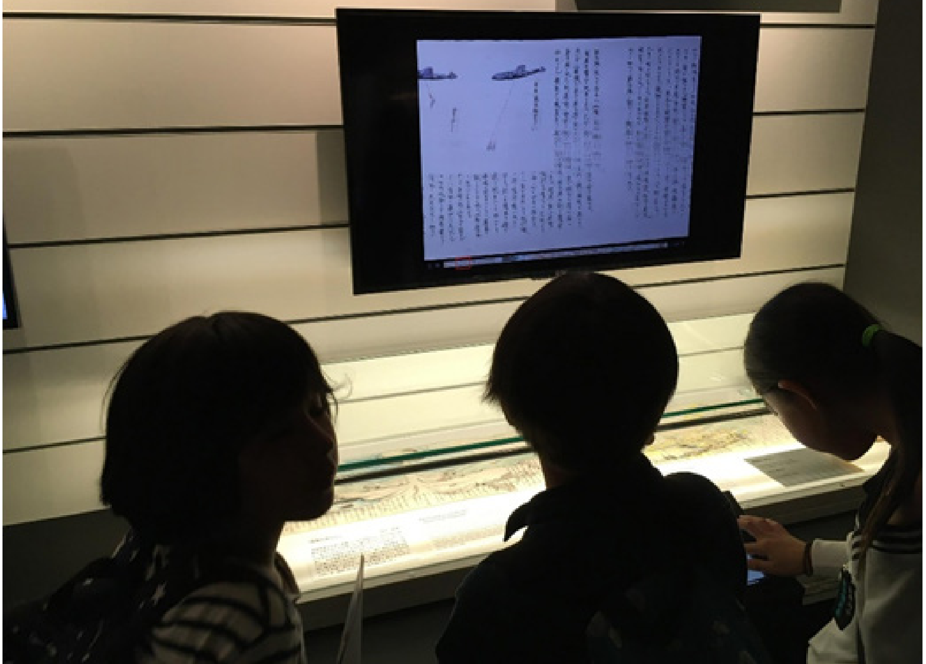

Figure 7. *Children examine a document using a touchscreen. Nagasaki Atomic Bomb Museum. Photograph by the author, November 2019.*

2018, p. 13). By remembering mass-atrocity, this museum is distinguished from museums which recall more generalised conflict or war (Williams 2012). And yet a secondary purpose of the museum is to allow the sufferers their own voice, adding to the multiplicity of story and narrative: the multiple Nagasakis. I will discuss such narratives in the following section.

The ongoing digitalisation of objects and the booming witness records offer new possibilities for the consideration of absence and loss in remembering the event of the atomic bombing of Nagasaki. Digitalisation extends the

Figure 8.
Projection mapping on a scaled model, Nagasaki Atomic Bomb Museum. Photograph by the author, November 2019.

reach of objects, and as they become digital objects, they become even more accessible and well-known. The twenty-first century museum is driven more by the ubiquity of digital adoption and use than by the emerging digital technology and tools available (Giannini and Bowen 2019, pp. 28-30). Digital culture takes a central place in human life, changing ways of knowing, doing and being.

Digitally Enhancing Objects

Digitalisation may enhance an object's 'life' and recognisability. Adopting a Marxist approach, David Graeber argues that there is another material value beyond the economic. He claims that an object will "seem to generate the very power it embodies" (2013, p. 225). The digitalisation of an object can extend that power within and beyond digital spaces.

Within the physical museum in Nagasaki, the evolution of digital objects includes multiple photographs and sufferer paintings digitalised on

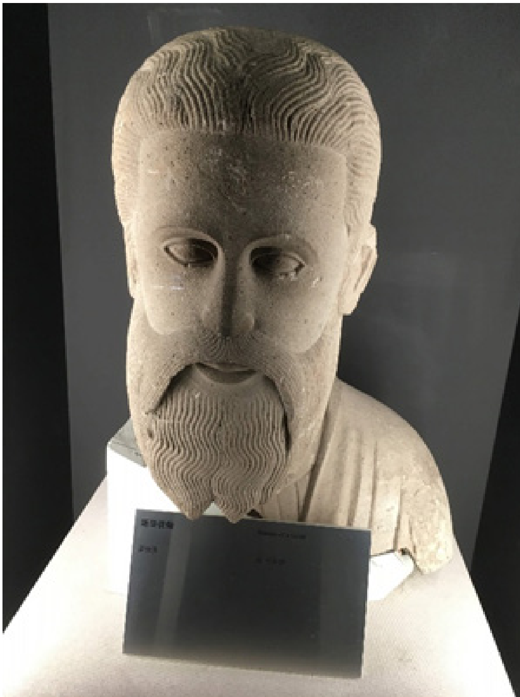

Figure 9.
Statue of a saint, November 2019, Nagasaki Atomic Bomb Museum Exhibit B. Photograph by the author, November 2019.

computers. Here, the public can interact with them and select those they wish to understand better. Touch screens are popular especially for school children familiar with the use of such technologies (Figure 7). Additionally, museum items are made more accessible through their digital transformation. Nakamura Akitoshi wrote that a previous difficulty was the sheer number of items in the museum's storage. Prior to digitalisation it was impossible to put them all on display for the public.

Nowadays, images too precious in their material state for public display are easily accessible thanks to their digitalisation. Nakamura described a traditional Japanese *makimono*, a scroll that was eleven metres long and thirty centimetres wide, that was drawn following the bombing, narrating in writing and sketches the remembered impacts of the atomic bombing. Previously, people could not access this scroll due to the danger of damage. After digitalisation, the content of the entire scroll is now easily viewed by members of the public, by touch-scrolling section by section on screen.

Projection mapping and computer graphics are used in the modern museum to demonstrate virtually the bombing on a scaled model of the Urakami valley (Figure 8) to crowds of visitors. Curators arranged the model in Exhibit B on a low table under lights, demonstrating the power of the bombing with video and sound effects. Several monitors allow visitors to follow the timed, descriptive video that testifies to the power of the bombing across the materialised topography of the scaled model miniature map.

The Nagasaki Atomic Bomb Museum might further enhance the 'life' of the objects displayed. The stone statue head of 'a saint' (Figure 9) from the Urakami Cathedral was at the time of fieldwork on display in Exhibit B, alongside the replica wall of the cathedral. This particular statue is striking, an undamaged face, with few blemishes; it can also be viewed online. A photograph of the statue is found on the museum website, although it is difficult to navigate in English.

A snapshot of the same statue in the aftermath of the bombing offers additional evidence of the 'life' of this object. Bernard Hoffman, well-known photographer for Life Magazine, took a photograph visible on the Time Magazine website of the same statue. He manipulated the image created by arranging the statue in the foreground of his photograph of the destroyed Urakami Cathedral. The juxtaposition affects how the viewer understands this image of the head without body, steadfastly staring at the lens, and arranged in front of the atomic destruction. The dis-embodied head-statue we may imagine representing the fracturing or ripping of the bombing and its impacts on the people of this town. This statue manipulated in the image is an early digitalised symbol ascribing a narrative of Nagasaki. The photograph in front of the church commemorated for the author's Western audience on the one hand an exoticism, and on the other the stark irony of the American bombing of the largest Catholic community to be found at the time in Japan. The photograph is also visible

Figure 10. *Screenshot of the Nagasaki archive. Permission Hidenori Watanave, Interfaculty Initiative in Information Studies, Tokyo University, 21 December 2018.*

on Google Arts and Culture, the second of the digital archives I describe further shortly.

Deep Memory and the Digital

In addition to the objects and concomitant digital objects discussed thus far, the witness records in museums, both physical and virtual, portray powerful narratives of the atomic bombing. Shoshana Felman and Dori Laub, explain how the "speech act" has transformative and ethical promise (Quoted in Torchin 2012, p.5). The deep memory of the witness impacts on interviewers and consequent witnesses, including the audience at the museum (Ostovich 2005, p. 44).

For witnessing, the digital takes centre stage. By combining video, audio and image, the physical museum incorporates witnesses' oral discourse, telling the stories of those known in Japan as 語り部 *kataribe*, literally the storytellers of the bombing.[6] The *kataribe* frequently acknowledge in their narrations the human, animal, and natural environments that were razed and are no longer visible. As well as digital archives incorporating recordings, videos, and scans of the kataribe drawings, the physical environment and reflective space found within the museum support their witnessing. Alongside the Nagasaki Museum proper is the "National Peace Memorial Hall for the Atomic Bomb Victims" (国立死没者追悼平和記念館 *kokuritsu shibotsusha tuitō heiwa kinen kan*). This Hall, built by the national authorities next door in 2002, focuses on the people who died; those made absent.

Oral historians including myself, praise the role of witnesses, who transmit through audio-visual archive testimony, social urgency and pleas for change. Sufferer (*kataribe* or *hibakusha*) narratives and audio-visual records are a major

6 Like Holocaust education, there is a transition from live to virtual sufferer witnessing, as discussed by Marcus et al. 2021.

focus at the Nagasaki Atomic Bomb Museum (as also in memorialisation of catastrophe around the globe: Sarkar and Walker 2009, p. 1). The impact on the audience of this section of the museum and similar testimony accessible through the Nagasaki Archive should not be underestimated. James Young describes a notable gap, however, between sufferers' "deep memory"[7] and the historical narrative. The prominence of the witness record in the museum allows for the voices of the victims to be heard (LaCapra 1998, p. 11; Young 1997, p. 49). Sound, video, and imagery bring these records alive, even as the eyewitnesses pass away and are no longer able to provide in-person testimony. The curators focus the digital and interactive content on the witnessing of the sufferers themselves, a task more important now as we move on toward the 80-year anniversary of 9 August 1945. Audiences select interviewees they wish to hear, and a wide range of interviews are played on monitors. The remembered sufferers include Japanese, and Korean voices, as well as Dutch, American and Australian POWs caught up in the bombing at the Fukuoka camp near Nagasaki. One section describes the large number of Korean and the Chinese sufferers from the bombing, who were essentially indentured labourers in Nagasaki, estimated at one in seven victims.

The Nagasaki Archive

For those unable to physically visit the Nagasaki Atomic Bomb Museum, the interactive online Nagasaki Archive offers a virtual museum, with amassed images, video, and testimonies.[8] This archive purveys a sense of place through the creators' careful mapping of the narrative on to the Nagasaki landscape (Figure 10). The site involved a collaboration between civil

7 By deep memory, Young refers to a term used previously by Saul Friedlander, for the memory the survivor retains that is not representable (1997, p.49).

8 Although scholars discuss the possibility that virtual museums will supersede the physical museum, so far the two have remained complementary (See for example, Evrard and Krebs 2018, p. 315). Yet the COVID-19 pandemic has meant that many people have been unable to visit a museum physically and are thus more dependent on virtual spaces.

society, the academic Hidenori Watanave and Nagasaki University in 2010, and was soon followed by the creation of a similar archive for Hiroshima in 2011 and another after the Great Japan Earthquake, tsunami and nuclear disaster of 2011.

Today, the Nagasaki newspaper supervises the Nagasaki Archive, supported by digital records supplied by the Nagasaki Atomic Bomb Museum. The Museum provides historical photographs for use on the Nagasaki Archive plus the map of the region in 1945. The archive integrates Google Maps, including multiple layers showing Nagasaki city as it was before the bombing and today. Additionally, the site includes witness profile photographs, or videos, with stories at the location where the witnesses remember they were at the time of the bombing, as well as photographs showing the extent of damage after the bombing occurred.

The Archive draws the viewer in by its arrangement of concentric circles around Ground Zero on the Google Map, layering in the old and new maps of Nagasaki city; the before and after. Through the Archive, the viewer is able to better understand the landscape of Nagasaki including its mountains, vital in distinguishing this city's experience of atomic bombing from that of Hiroshima (See Shijō 2015, p. 54). Witness records are made prominent by the inclusion on the map of the profile pictures of sufferers. Mapping interactivity and the layering of digital objects in the Nagasaki Archive, while not comprehensive, allows the viewer to imagine the landscape and the impacts. In contrast to the physical museum, here users can zoom in and out at leisure, and interact with the space as a multi-layered curation. Whereas in the physical museum visitors view a map briefly in Exhibit A and again in the holographic presentation in Exhibit B, on the Nagasaki Archive, every link to objects, photographs, videos, and witness records are wholly incorporated in the online map. Additionally, in the archive schema, compared to the physical museum, the realia, or objects, are a lesser part of the narrative, and the witness records emerge

as the predominant primary source. In this way, the "Nagasaki Archive" website demonstrates in cyberspace how the narration of 'the bombing' in Nagasaki may indeed be enhanced by digital techniques.

In the Archive, as opposed to the Nagasaki Atomic Bomb Museum which guides visitors through a pathway, viewers may begin, continue, and finish where they see fit. Of course, there are both positives and negatives of the lack of a guided route. The viewer of the archive chooses a starting point and manages the extent of their personal immersion in the digital space. One might begin at Ground Zero, or alternatively near the city (about 2-3 kilometres south), where the viewer will find many more witness records. Whereas visitors to a memorial museum may become overwhelmed and overloaded, the virtual space offers the opportunity to dip in and dip out, or to consider one aspect, avoiding full immersion in the space for a long period of time. Additionally, the digital archive lends itself to the disparate, fractured and incomplete nature of the narratives, while held together by the digitalised map.

Exploring the Archive

The timeline features of the Nagasaki Archive emphasise how trauma freezes time, turning back to 'that day' in 1945. By clicking on a timeline feature, the viewer may move the map gradually from the 1945 representation to the 2015 map of Nagasaki City. Both maps can be turned off, to view an aerial photograph. The viewer can be taken back in time to 'snapshots', memorialisations of the fractured memory of the bombing and its aftermath. By clicking on a small photograph to enlarge, the viewer may closely examine historic photographs placed on the overlay map of the archive. The collaborative and open source OpenStreetMap view of locations is revealed when looking at such historical photographs; the old appears on the new. Of course, the Nagasaki Archive is not the only example of a digital platform: let us consider one more.

Google Arts and Culture: Nagasaki Atomic Bomb Museum

The *Google Arts and Culture: Nagasaki Atomic Bomb Museum* is one further virtual site that demonstrates another example of digitalisation of the story of the bombing. This site incorporates three exhibits, one focused on the destruction of the Urakami Cathedral near Ground Zero, the second examining the impact of the bombing on the natural world and the third, the impact on the city. Compared to the Nagasaki Archive's predominant focus on witness records, and to the physical Nagasaki Atomic Bomb Museum where both objects and witnesses are central to the narrative, this digital resource constricts focus to a static photographic record (as well as a few videos) and is essentially more linear. The viewer can examine the overall archive of the presented photographs or browse through one of the three 'exhibits' mentioned above. After clicking on an exhibit, a scrolling unidirectional story is revealed, curated by representatives of the Nagasaki Atomic Bomb Museum. The exhibits follow a format like an online newspaper story or magazine, incorporating the large central photographs, and interspersed with English narratives. Although written by narrators from the Nagasaki Atomic Bomb Museum, the discussion is generalised and does not offer the richness of the multiperspectival records available at either the physical museum or on the Nagasaki Archive. Due to its linearity, the Google Arts and Culture site leaves much less scope for interpretation, compared to the physical museum and the Nagasaki Archive. Although the site describes some important historical photographs, and there is every possibility of empathetic engagement, the content is presented in a shallow, reductionary way that de-emphasises the complexity of the Nagasaki narrative and resulting trauma. With its singular photographic record, the Google Arts and Culture site is considerably less rich in its content than either the Nagasaki Archive, or the original Nagasaki Atomic Bomb Museum.

Democratising memorialisation with Digitalisation

Both the Nagasaki Archive and the Google Arts and Culture site require no entry ticket, and therefore represent a democratisation of memorialised space offered via cyberspace. Reflecting on the atomic bombing is both painful and difficult. Allowing individuals to examine evidence in private and over time, rather than in a constricted time in public presents an advantage in the use and continuing development of the Nagasaki Archive and the Google Arts and Culture site. Digital interactivity and web functionality allow people to continue their learning about events such as the Holocaust and the atomic bombings online, in addition to museum visits (Reading 2003, p. 67-8). There are many positives about the documenting of the 'life of objects' across virtual space on the two digital sites, adding to the likelihood that the objects' value and potential interpretations will increase and enabling a reach for a global audience of millions (Giannini and Bowen 2019, p. 37). Both digital sites offer an opportunity to narrate the 'life' of an object, and to move physical collections from a familiar linear to a more complex and inclusive format, supported by geographical information systems. The Nagasaki Atomic Bomb Museum exerts some influence on both digital sites mentioned, and if able to integrate the two resources of the Nagasaki Archive and Google Arts and Culture as cross-referencing arms of the museum itself, the visitor experience at the museum stands to be further enriched (Biedermann 2021).

Studying in online spaces reveals more both about the narration of the bombing and the inherent gaps in narration. The integration of the Archive in the landscape of Nagasaki is highly effective in the narration of the bombing, and the prioritisation of witness records on the archive will potentially enhance the experience of visiting the physical museum space. I have noted elsewhere that the Nagasaki Archive (like the Hiroshima Archive) reveals a wide vacant area of space in the centre, with few witness records represented by faces and testimonies — this lacuna is representative of the widespread loss of very particular narratives, due to its proximity to Ground

Zero (McClelland 2019a; Nagasaki Shinbun 2016). Communities at risk of being forgotten due to the above gap include the 部落民 *burakumin* (pejorative name) outcaste smaller minority community as well as the Catholic minority community located in Urakami (See McClelland and Chapman 2019b). The digital Nagasaki Archive, like any museum, requires careful curation, taking careful account of such gaps and silences.

As when visiting a physical museum, in examining the digital Archive or the Google Arts and Culture site, additional interpretation and imagination envisages what is missing: the lost, and the elided. In order to encompass such gaps, the digital space like the physical must be equally cherished and supported by the communities of historians and the varied public audiences whom they serve. To approximate the place-based museum, the virtual memorial museum that recalls trauma must make a connection through the screen to the viewer, and to their own troubled, or disrupted place.

In short, in comparing the two digital platforms, the Google Arts and Culture site on the one hand, is two-dimensional with limited included narratives tending toward the prescriptive. Exploration of the Archive on the other hand, is not quickly exhausted, with its larger resource of digitalised objects, photographs and videos. Having said that, a major drawback, at least for the international community, of the Nagasaki Archive, is that despite being created prior to Hiroshima's Archive, it is still today untranslated from the original Japanese language. Meanwhile, it is possible to examine the Hiroshima Archive, already translated largely into English, and so non-Japanese audiences will in many cases be drawn to examine this one instead of the Nagasaki case.

Limitations of Virtuality

While the Nagasaki Archive efficaciously maps out the trauma of the bombing, space and place are not easily replicated to the virtual world. Indeed, materiality is essential to the sacralisation of place. The presence of

a 'Peace Memorial Hall' adjacent to the Bomb Museum where the absence of those who were killed is recalled by the symbolic sound of running water, is impossible to replicate online. The political rationale the "National Peace Memorial Hall for the Atomic Bomb Victims" (mentioned above, the 国立死没者追悼平和記念館 *kokuritsu shibotsusha tuitō heiwa kinen kan*) does not stand without criticism. The memorial was sponsored by the national authorities early in the twenty-first century. There is an ongoing danger the bombing is not understood in context of the historical causes rising to the final acts of World War II, and instead as a singular event visited upon the Japanese nation. In the Japanese context, the trauma of the atomic bombings of Hiroshima and Nagasaki must be understood in the context of the risk that they will become or already have become a collective or national myth of victimisation (Shipilova 2014, p. 204). Daniel Seltz identifies a "religious tone" from the Hiroshima narrative fuelling a "right-wing" tendency to play up the narrative of the war as sacrificial (1999, p. 93).

Nonetheless, the presence of this reflective and abstract memorial alongside Nagasaki's Atomic Bomb Museum is not always interpreted as sacrificial by the visitor(s) (Seltz 1999, p. 92-93). This is a place of reflection and prayer: memorial services are held here; the names of those who died is collected and a basin of water, a waterfall and a pool recall the "water the victims craved" in the aftermath of the bombing. The building was sponsored by the national government, but, as Young (2002) argues in the case of Holocaust memorialisation, the visitors' interactive interpretation allows for varied responses to it, in its context, alongside the nuances presented by the neighbouring physical museum and the Peace Park. A webcam or virtual space cannot replicate the bodily, material nature of the architecture of the public space of the National Peace Memorial Hall, the physical nature of the flowing water, and the light and darkness of this monument.

Digitalisation does not allow a holistic understanding, especially of place. The viewer's sense of the social construction of place is limited by avoiding the

physical museum and relying solely on the virtual alternatives of Nagasaki Archive or Google Arts and Culture. For it is the local community of Nagasaki, the witnesses, and the inheritors of trauma through postmemory (McClelland 2021) that are the major contributors to the public culture of the museum. Also relevant is the phenomenon of 'dark tourism'. What is the effect on those interested in dark tourism of studying a place like Nagasaki via online sites only? The city has traditionally drawn tourists interested in both the 'dark' aspects of the history of the atomic bombing and the more generalised history of other parts of the city, including the Dutch presence on Dejima through the period of Japan's closure, and early European trade (Bui, Yoshida, and Lee 2018). There are multiple 'dark' histories in the region, including for example the history of the interned Korean workers on Hashima Island, 'Gunkanjima', or 'Battle Ship Island'. In fact, replacement of the place-based museum by the virtual leaves any further understanding of the context up to the viewer, and their own motivation for research, beyond the initial site.

Conclusion

The Nagasaki Atomic Bomb Museum is a memorial museum faced with a difficult task of describing a story of traumatic experience: that is ultimately unknowable. Perhaps, the museum is better defined by the empty space set aside within it that acknowledges the shattering and the obliterations of collective trauma. The memorial museum's project is an important task that is enhanced by combining digital technologies and literacies that the community already manipulates. In this chapter I have compared the Atomic Bomb Museum to two solely online spaces that both draw on the resources of the physical museum: the Nagasaki Archive and the Google Arts and Culture site. The Nagasaki Archive points to what was made absent by the bombing by displaying photographs, objects, and witness records of the bombing in an imagined space, its virtual mapping creatively depicting the widening

concentric circles outside the hypocenter (Ground Zero) of the bombing.[9] If the digital must embody the effects of the bombing, or make these impacts easier to understand, as former Bomb Museum Director Nakamura Akitoshi exhorts, then it must gesture towards what is absent. On the Nagasaki Archive site this is hauntingly achieved. Conversely, the Google Arts and Culture site is less successful in describing the multiplicity of Nagasaki experiences of the bombing. Digitalisation requires careful and thoughtful curation, and does not by itself promise the enhancing of audience understanding. It does not automatically open up multiplicity or multivocality.

If the benefits of digitalised memory are to be maximised, continual and ongoing liaison between the three varied spaces of memory about the bombing of Nagasaki must occur. History is by nature contested, with a tendency to privilege certain voices above others, and so the curation and civil input for the collaborative project supporting the narration of the story of the bombing of Nagasaki is of highest priority. As long as the collaborative approach and local input remains high, renewed linguistic efforts to improve the already excellent digital resources will allow for the continuing expansion of the reach of the two sites to the public around the world. This will be an added benefit for the Nagasaki Atomic Bomb Museum.

There are limits, of course, to the usefulness of digitalisation and the physical space will continue to be of vital importance. In relying only on the digital, the social, communal and sacred experience of visiting this place, in its very specific cultural, context is lost. The concept of sacralised space – a place of quiet; of prayerfulness; of grief – is not easily conveyed through a screen. Sacred places require materiality. As the digital connects the viewer to their own place of grief, there remains an opportunity for connection. In short, the

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9 The concentric circles recall the Catholic doctor, Akizuki Tatsuichiro, and his searing 1972 book in Japanese that details his memory of the recovery after the bombing of Nagasaki: 死の同心円*: Death's concentric circles.*

curators' use of the digital increasingly supports and enhances the significant work done within the physical Nagasaki Atomic Bomb Museum.

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"This chapter is dedicated to the citizens of Nagasaki, to the museum curators, and to the sufferers of the atomic bombing and their children and grandchildren, who continue to tell the story of 'that day'. Thanks also should go to Seirai Yuichi, and to Keren."

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