

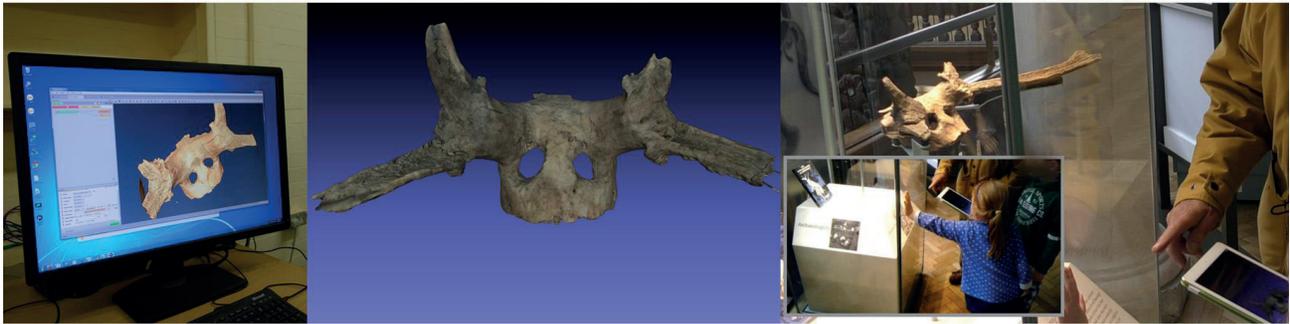


# Authenticity and cultural heritage in the age of 3D digital reproductions

Edited by Paola Di Giuseppantonio Di Franco,  
Fabrizio Galeazzi and Valentina Vassallo



Authenticity and cultural heritage  
in the age of 3D digital reproductions





McDONALD INSTITUTE CONVERSATIONS

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Edited by Paola Di Giuseppantonio Di Franco,  
Fabrizio Galeazzi and Valentina Vassallo

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## Chapter 10

# Pitoti Prometheus, virtual reality 360: Valcamonica rock art between naturalism and alienation

Frederick Baker

Prometheus:

They may be bound here  
by their lifelessness,  
But they are free  
And I feel their freedom!

Johann Wolfgang von Goethe  
1773, 181.

The demi-god Prometheus dreams of making static human figures come to life and rise from the rock. What Goethe wrote and Prometheus dreamt of is now within the realms of possibility, thanks to the digital revolution and the creation of 360-degree virtual reality (VR). Digital archaeologists and VR filmmakers can be modern-day Prometheans, puppet masters able to draw life from stone. In the valley of Valcamonica, the rock art figures are known as ‘Pitoti’, or ‘little puppets’.

The tale of Prometheus is the story of a demi-god’s rebellion against the gods. It has been told by the likes of Hesiod, Coleridge and Kafka and has even been set to music by Schubert and Beethoven. Now a 17-minute virtual reality film, ‘Pitoti Prometheus’, draws from the tale, using Copper Age and Iron Age rock art from Valcamonica (Baker & Karnapke 2016a). It is probably the film with the longest production time in history: much of the pre-production artwork was done in *c.* 2000 BC and the final post-production animation was completed in AD 2016 (Fig. 10.1).

In many senses Prometheus stands as a model for the creative possibilities offered by digital archaeology and particularly virtual reality filmmaking. The Promethean forces of creativity are similar to those of a hacker unleashing the powers of disruption into the settled world of archaeological recording and visualization. As his name suggests, Prometheus is ‘Literally

*the “man with foresight” (from Greek pro, “before”, and Medea, “thoughts”); Hicks 2015:1).*

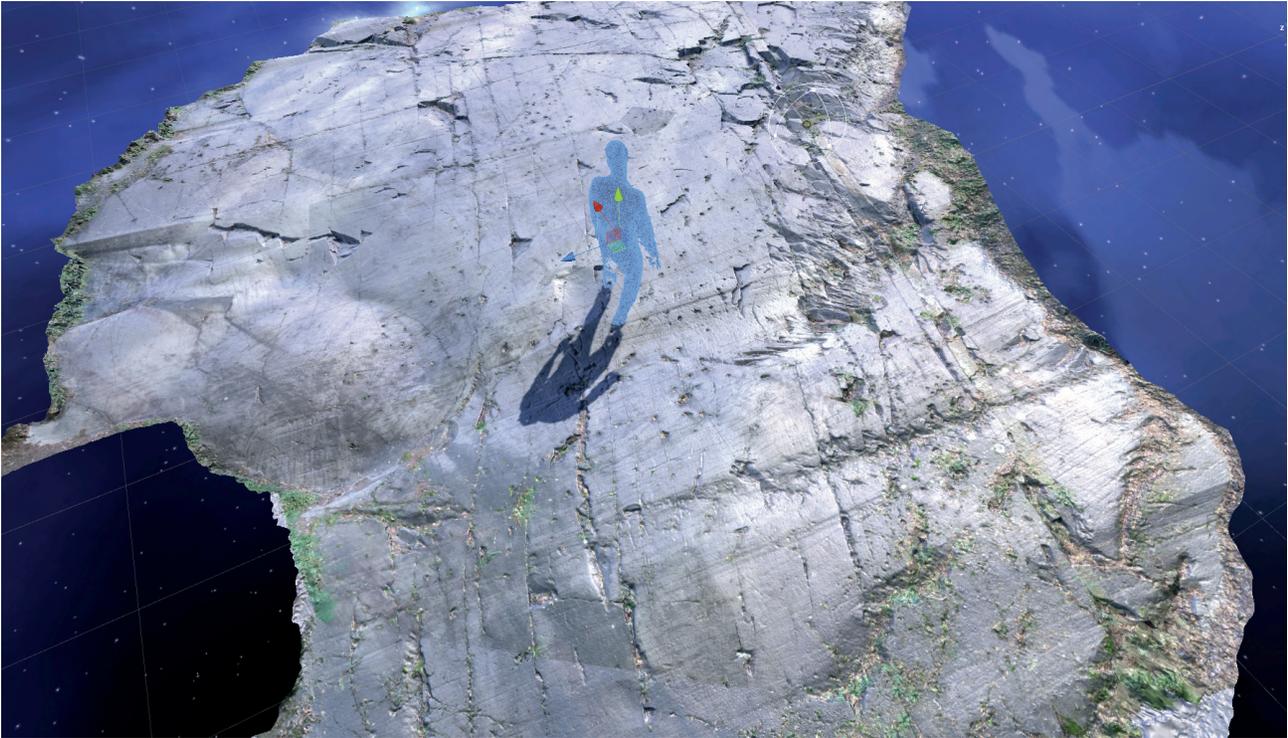
Looking ahead, the key question posed by these Promethean possibilities is how can rock art be brought to life in an authentic manner, that satisfies both academic as well as entertainment criteria? This is new territory. While the field of archaeological film (i.e. film about archaeology) is old, true archaeological film, in the sense of making film directly out of archaeological material such as 3D scans, is in its infancy. It will therefore be argued that differing claims for the authenticity of digitally captured archaeological artefacts requires a nuanced approach, one that has much in common with debates around the realm of theatre and must start with the nature of digital archaeology itself.

### Digital vs virtual

The first question is what we should call this new field of inquiry: digital or virtual archaeology? This is important, because it influences the question of authenticity across the whole field.

The term ‘virtual archaeology’ was first coined in 1991 by Reilly to describe the new visualization techniques that had then started to be used for examining archaeological data sets (Hook 2014). But the essential problem with the word ‘virtual’ is that it suggests a dichotomy between a virtual and a real archaeology. Anthropology has had a similar dilemma. Daniel Miller and Barbara Horst rejected ‘virtual anthropology’ in favour of ‘digital anthropology’ on the following grounds.

‘Materiality is the bedrock of digital anthropology, and this is true in several distinct ways of which three are of prime importance. First, there is the materiality of digital infrastructure and technology. Second, there



**Figure 10.1.** *Prometheus on Seradina 12a*. Still from ‘*Pitoti Prometheus*’ (Dir. Baker 2016).

is the materiality of digital content, and, third there is the materiality of digital context’ (Horst & Miller 2012, 13–25)

Anthropology has a whole range of material and immaterial culture to work from, since it is largely dealing with extant societies. But for archaeologists there are no immaterial cultural sources, such as song, dance and language.

The comparison between archaeology and anthropology is similar to the difference between the Olympics and the Paralympics. Anthropologists can study a full corpus of evidence, whereas archaeologists are forced to evaluate the merits of data sets that are by their nature fragmentary and incomplete. This is where digital technology steps in, because the ‘digital’ in archaeology can play the same role as prosthetics do in sports medicine (Baker 2014).

The Greek word ‘prostheses’ comes from the word for addition, application or attachment. Digital visualizations are additions grafted onto excavated material data so as to complete a fragmentary view of a city or a building, until it is deemed ‘life like’ and therefore successful. The most powerful and evocative are examples of buildings that have been destroyed in war like the arch at of the Temple of Baal in Palmyra, which has been physically reconstructed at two thirds

size by the Institute of Digital Archaeology under the leadership of Roger Michel in London and New York (Clammer 2016). Film and 3D computer reconstructions have had to suffice for the long-demolished church of San Per Maggiore in Florence. In this case the main aisle of the church has become a street and the digital reconstruction led by Francois Penz and Donal Cooper shows that Francesco Botticini’s striking ‘Assumption of the Virgin’ would have been hanging above the altar in what is now thin air. Now at London’s National Gallery, this reconstruction has helped scholars to understand that the Renaissance painting’s abnormal circular depictions of celestial bodies were meant to be appreciated by worshippers looking upwards and not straight ahead, as is normal in an art gallery (Cooper & Penz 2015).

As with prosthetic reconstructive medicine, digital archaeology requires an interdisciplinary team – historians, computer scientists, graphic designers, statisticians and heritage managers – to get results. These heritage professionals work on the shattered bones of the past. Digital archaeology can record this incompleteness and can then facilitate a proposed reconstruction of each ruin, each shard and each skeleton.

The difference afforded by the digital revolution, over and above the traditional reconstruction

techniques available to the archaeologist, is that of the speed, scale, exactitude and interactivity offered by computerized information technology (greatly surpassing the old analogue methods). In the digital realm the micro and the macro become telescoped and therefore more malleable. Time is extendable and more precise than before. The time taken for processes within the data set is also decreased, allowing more iterations and modelling. The same can be said of space. Here seamless transitions can be made in orders of magnitude from the sub millimetre to hundreds of kilometres. The 'copy and paste' reproducibility of data is another key feature of the digital sphere. The concept of the 'original' is replaced by the technical qualities of copies. Finally, interactivity is a crucial addition to the repertoire of possibilities that historical researchers have on offer to analyse and represent data gleaned from the past.

In my understanding of digital archaeology, reconstruction is not virtual or based on fantasy, but rather is subject to the rigorous analytical application of digital reconstructive techniques, which mobilize the past through a combination of historical imagination, precise data sets and an exacting use of information technology; hence the need for the self-regulating charters of London, Seville and Ename. Maurizio Forte (2015) argues that these charters are impractical in the field and proposes a form of 'cyber archaeology', with an emphasis on the interactive potential of avatars and feedback loops aiding investigation and not just the display element foregrounded by virtual archaeology. While highly supportive of the investigative use of computer-aided techniques, the term 'digital archaeology' seems to embrace both of these schools.

### Naturalism – recording rock art

In 'Pitoti Prometheus', both the viewer and Prometheus look upon a digital 3D simulacrum of the Valcamonica rock art panel known as Seradina 12c, the second largest panel of its type in the valley (Fig. 10.2).

The 3D panel is an exact copy of the original created by a scanner developed by the Technical University of Graz and the associated 3D-Pitoti research consortium (3D-Pitoti Consortium 2014). It fulfils the authenticity criteria of an icon or simulacrum, or, put another way, a naturalistic recording. 'An icon is a direct representation of something already known; a simulacrum for something in the real world. It is not the referent itself (i.e. the thing in the world) but it shares the properties with that referent – it is 'like it' in a recognisable way' (Webb 2009, 47). The history of rock art research in Valcamonica shows that the

key question is how much information is needed to be 'Like it in a recognisable way': black and white or colour, 2D outlines or 3D?

The rock art in Valcamonica dates from the Neolithic to the Iron Age, with some outliers in Middle Ages. An estimated 150,000 engraved images have been hammered into the glacier-smoothed flanks of the sandstone valley that runs south from the Adamello National park down to Lake Iseo, entering the Po plain at Brescia in present-day Italy.

The art is attributed to an Alpine tribe the Romans called the Camuni, and it has been known to the academic world for over 100 years. Until now only one form of recording has managed to record the art in its true three-dimensional nature: the so-called 'calchi' are plaster casts made in the 1960s by the local craftsman to record the curvature of the natural rock and the indentation of the engraving as a positive preclusion. (Marretta 2008). The 'calchi' are very sculptural, but do not record the colour of the art or its larger context, since the art is organized in panels, that contain up to 100 images.

The recording of larger panels has been done by a process of tracing developed in the 1960s that is still in use to this day (Anati 2008; Mareta & Cittadini 2011). Large, transparent plastic sheets are taped to the panel surfaces and the outlines of the rock art figures are drawn on to the plastic with felt-tipped pens. These collections of black outlined figures show the graphic forms of the works and the composition of a panel, but lose all information about the figures' colour, depth and the subtle shading. One way around this has been to use academically trained painters to produce oil paintings of the rock art panels, as was done by a Frobenius Institute expedition in the 1930's (Kohl et al. 2015). Even when all forms of photography are added to the list of recording techniques, we still are left with 100 years during which no medium has been able to authentically and fully record this unique collection of UNESCO-listed rock engravings.

That is, until the Prehistoric Picture Project and its off-shoot the 3D-Pitoti Project started to use digital technology to record and analyse the rock art in 2010. Scanning is based on the realization that rock engravings are as much about air as about stone. This proved key to guiding the micro volumetric work undertaken by Marcel Karnapke with the 3D scanner and later the 3D printer (2014, 2015). The 3D scanner has been able to record the the depth of the engravings, as well as in their other two dimensions. This has allowed the volume of rock that was extracted at the engraving's creation to be calculated and reconstructed using 3D printing. What was then dust is now air, a volume that becomes the thin plastic body of a sculpture when



**Figure 10.2.** *Sunset on Seradina 12a, with ploughing scene. Photo Hamish Park.*

printed. The prints recall the work of the modernist sculpture Alberto Giacometti. The digital difference is that the 3D prints can stand alone as the extracted volume, as thin as the true Pitoti engravings (Karnapke 2012; 2015).

In digital rock art exhibitions at Milan and Cambridge, 3D plastic prints of the engraved rock surfaces have allowed the public to touch the art and feel the indentations with their fingertips. This authentic measurement and reproduction of depth thus facilitated a playful tactile encounter with the work of the anonymous artists of Valcamonica – an encounter that was especially useful for visually impaired visitors. The lightness and durability of the plastic prints also made it possible to let children explore the engravings without fear of destruction.

By linking the rock scans with mid-level scans from drone flights and satellite data of the valley, the 3D-Pitoti Project has been able to build a scalable picture of the pitoti in their valley context. After Marcel Karnapke and Felix Trojan's initial test scans it was clear that the scanner needed to be specially developed for work in the mountains. It can now record the undulations of the rock and its engravings in fine detail, and crucially it can also gather photographically correct colour information (Höll et al. 2014).

The 3D Pitoti team faced one huge challenge in attempting to record the corpus of work in Valcamonica and that is space. The rock engravings are spread across over 100 km of alpine terrain. An estimated 150,000 images form the 'big picture', rather like the many small figures that make up a Bosch or Breugel painting. That means that much more than any other art form, the Pitoti art goes from the macro to the micro. They are one large collection of figures and patterns spread across a vast area, but that have been created by a millions of millimetre-size hammer blows. GIS research by Craig Alexander (2012) has shown that the rock art sites form a pattern of inter-visibility that goes beyond the chance positioning of locations, making a macroscale understanding of the art all the more important.

The scalability of the digital realm has proven to be an ideal asset in capturing this micro/macro-scale corpus, with drones being programmed to scan whole panels in 3D and so providing the mid-range linkage between the satellite data and the micro scanner information (Mostegel et al. 2014)

#### **Naturalism and authenticity – the fourth dimension, time**

The fourth dimension for an authentic appreciation of Valcamonica rock art is time. The indicator of time in

open-air rock art is the sun. It is with the observation of the passage of light across the Pitoti that the true nature of the rock carvings comes to life. In this form of proto-cinema, the morning and evening light creates a natural 3D effect. The long shadows cast by the low light make the figures seem to protrude from the rocks (Fig. 10.2). In contrast, when the sun reaches its high point at midday, the images disappear as they merge with the surrounding natural rock.

These proto-cinematic effects underline why the rock art figures are referred to as Pitoti. This local dialect word roughly translates as 'little puppets'. It is a reminder that the engravings are not neutral, but in the mind of the prehistoric artists will have had meaning and that those artists were part of a historical process. The Pitoti appear and disappear, just as puppets enter and exit during the performance of a play.

This is not a chance analogy since links have been discovered between art and theatre in Greek art that is contemporary with some of the Pitoti. In his study of the interaction between Greek drama and the visual arts of sculpture and vase painting, the classicist Herbert Golder reminds us that the ancient writer Athenaeus recalls that 'gestures in sculpture were said to be the relics of old dances' (1996a, 326). Research into other plays has revealed links between the gestures on vases and those used in plays (Golder 1996b).

This was of considerable interest when considering the question of what would be an authentic production design for the Prometheus film, where the hero has to stand above the rock art and say

Prometheus

Here is my world, my heavens!  
 Here I feel myself to be;  
 Here are all my desires  
 In physical form.  
 My spirit a thousand-fold divided  
 and whole with my dear children  
 What a special moment!

von Goethe 1773, 178

The stone upon which he stands is authentic. The valley that surrounds him has the exact topography of Valcamonica thanks to digital cartography. But how should his 'little children', the rock art figures, move and be dressed, if dressed at all. The research question posed was: how far should authenticity go, in a digital world where almost everything is technically possible?

Fundamentally, there are two concepts of authenticity regarding the portrayal of the past. The first is naturalism and the second is alienation. Both have a tradition in theatrical stage design and warrant a close

examination. Robin Boast has made a particular study of the origins of naturalism:

Nowhere is this preoccupation with re-presenting the objective past so apparent as in the theatre. In its ability to provide a three-dimensional, visually realistic experience of an accurately reproduced setting of the past, the theatre was unrivalled in the nineteenth century. The historical theatre of the middle and late nineteenth century in Europe, and primarily in England, was increasingly a site of collaboration between actors, artists, scenic specialists and archaeologists. This collaboration was exemplified by the productions of two men, Charles Kean and William Godwin. Both Kean and Godwin had trained as architects, published extensively on classical architecture, and both were Fellows of the Society of Antiquaries.

Kean was an avid supporter of historical reconstruction in the theatre. In his 1853 production of *Sardanapalus*, at the Princess's, Kean produced what was seen at the time as a masterful re-presentation of the Assyrian setting. Kean's purpose went well beyond performing Byron's tragedy 'to render visible to the eye... the costume, architecture, and customs of the ancient Assyrian people, verified by the bas-reliefs... to convey to the stage an accurate portraiture and living picture of an age long since past away.' (Cole 1859, 58–9).

The computer has become a *scientific* stage upon which archaeologists can finally re-enact the past 'accurately', 'authoritatively', and without the annoying subjectivity of human actors. Archaeologists, like the nineteenth-century theatregoer, 'register the image not only as an accurate record, designed to satisfy antiquarian interest, but as a "shifter" (to use the linguist Jakobson's term) between present and past.' (Bann 1995, 120). It does not matter that much if the contemporary archaeologist uses the computer-generated stage as Godwin intended, as an objective detached view of a scene from the past, or as an engaged post-processualist interpreter; the game is the same:

'The computer program requires the archaeologist to make decisions about the original texture and colour of all the surfaces of the buildings. Decisions have to be taken, or alternative possibilities formulated, about the destroyed upper parts of buildings. The computer reconstruction also brings to the surface interesting questions about the original lightning of each room and house. The resulting 3-D experience has to be seen to be believed: that is what virtual reality is about.' (Renfrew 1997, 7)

Indeed it is. It is a spectacular performance, one that again demands that we suspend our belief that the object we are engaging with is a contemporary computer with a keyboard and mouse, as the theatregoer of the mid-nineteenth century was to suspend their belief that they were looking at a contemporary stage. We must convince ourselves that we are looking at 'the *real* past' (Boast 2002).

### Alienation

The original emphasis of the word '*real*' reeks of Boast's scepticism and irony when it comes to the question of authenticity. One man who would have shared Boast's opinion was the Bavarian born playwright and theorist Bertolt Brecht. His mission was to purge theatre of its nineteenth-century practitioners like Kean and Godwin. Brecht developed his '*Verfremdungstechnik*' or alienation technique in 1935, after a trip to Moscow and then attendance at a performance of traditional Chinese opera in Berlin. Brecht writes that his actors should be: 'Playing in such a way that the audience was hindered from simply identifying itself with the characters in the play. Acceptance or rejection of their actions and utterances was meant to take place on a conscious plane, instead of, as hitherto, in the audience's subconscious' (Willett 1966).

Brecht's 'alienation technique' means actors should not act as if there were a fourth wall to the audience. Stage design was to be sparse and anti-illusionist: for example, a scene set in Rome would be indicated by a sign reading 'Rome', rather than by a backdrop of classical columns. In terms of practice-based research, I share Brecht's worries that too much naturalism can make the audience switch off its critical faculties towards the historical narrative that is being depicted. In his short Organum for the theatre he wrote:

'...we must drop our habit of taking the different social structures of past periods, then stripping them of everything that makes them different; so that they all look more or less like our own, which then acquires from this process a certain air of having been there all along, in other words of permanence pure and simple. Instead we must leave them their distinguishing marks and keep their impermanence always before our eyes, so that our own period can be seen to be impermanent too.... The classical and medieval theatre alienated its characters by making them wear human or animal masks; the Asiatic theatre even today uses musical and pantomimic effects. Such devices were

certainly a barrier to empathy, and yet this technique owed more, not less, to hypnotic suggestion than do those by which empathy is achieved. The social aims of these old devices were entirely different from our own...'. (Willett 1966, 190).

For Brecht, the viewer (and/or archaeological researcher in our case) needs to

'...transform himself from general passive acceptance to a corresponding state of suspicious inquiry he would need to develop that detached eye with which the great Galileo observed a swinging chandelier. He was amazed by this pendulum motion, as if he had not expected it and could not understand its occurring, and this enabled him to come on the rules by which it was governed. Here is the outlook, disconcerting but fruitful, which the theatre must provoke

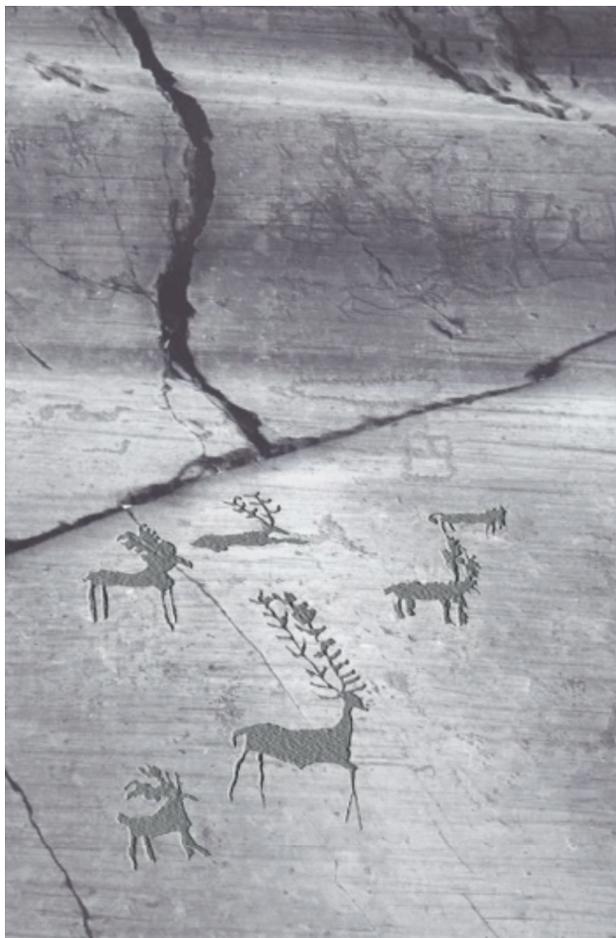


Figure 10.3. 'The Hunt' (Dir. Kren 2012).

with its representations of human social life. It must amaze its public, and this can be achieved by a technique of alienating the familiar'. (Willett 1966, 192).

It is fitting that apart from meaning 'little puppet', the word Pitoti also means 'strange' or 'abnormal' in the local dialect of Valcamonica. The clearest example of the use of alienation technique in a digital archaeology context came with the 2D Pitoti film 'The Hunt', with animations by Mike Kren (Kren et al. 2012, Chippendale & Baker 2012, 78–9). (Fig 10.3).

One evening after the first field season, the animator Mike Kren called me and asked:

*'Can I put some knees in the legs of the ancient deer? The prehistoric artists have not included them. They have just engraved straight lines for legs.'*

I must admit I had not really noticed this kneelessness of the prehistoric deer before, as it just seemed part of the minimalist charm of the work. I answered:

*'No. Let's see how the deer move the original artists saw it, that is according to their skeletal and kinetic understanding of movement.'*

That was the birth of 'Pitoti film rules': the animator is only allowed to move joints that are clearly indicated in the engraving. That means that the exhibited animations of deer move in a stiff manner with unbent knees, just as drawn by the Camunian artists. The effect is slightly comical, but has the advantage is that it does not allow the public to think in the safe categories of Walt Disney's Bambi. Instead Mike Kren rose to the challenge of working with the Pitoti film rules as creative restrictions to preserve the potential otherness of the Pitoti. This is not to say that the Camunians could not draw knees or that prehistoric deer did not have them; it only shows that, for the ancient artist, the knee was not important enough to be emphasized. This is an key example of why I would classify the rock-art of Valcamonica as an ancient form of minimalism that runs in parallel to the naturalistic tradition of depiction that was perfected in classical Athens, and was much copied there after (Baker 2015).

#### Arts-based research

'The key value to be defended is the potential "otherness" of the past. That which is known, but diverges from the expectations of today. The paradoxical otherness of

the Pitoti and the past in general is neatly summed up in, the co-curator of the Pitoti exhibition, Christopher Chippindale's observation: *Pitoti are aliens, but aliens like ourselves* (Chippindale & Baker 2012)

As Christopher Chippindale's insight suggests, the key question is then how to move forward with the paradoxes surrounding Pitoti in an authentic manner of self alienation. The path taken has been arts-based research. We must realize that rock art is just as much about the art as about the rock. It therefore often takes an artist to authentically understand the work of another artist. Take, for example, Dr Hamish Park. He is both a trained anthropologist and a professional photographer and it was his job to photograph the Pitoti for research purposes. He describes his technique as follows:

'The great photographer of Paris, Brassai, reported showing Picasso his prints of street graffiti; Picasso was so taken with them that he proposed that he make a graffiti which Brassai would photograph. Whilst it is not recorded that this happened, their capacity for appreciation was always in my mind when photographing Pitoti. What might Brassai or Picasso have made of them? I think they would have been delighted not just by the inventiveness and the observation, but also by the wit, which is frequently evident. I am certain that he would have drawn out his pen-knife and pecked images in the rocks. What Brassai's (1983) observation of Parisian graffiti and Picasso's appreciation show is that art does not always reside in the great museums and galleries, nor is it necessarily the provenance of acknowledged masters; it is often found in unexpected places made by the hands of those whose names were never recorded. So, it is with the Pitoti of Valcamonica. When I came to photograph them I did so in the spirit of Brassai, taking each incision seriously; trying to understand the way in which it had been crafted into the surface of the rock and to use that knowledge to convey my appreciation of those unknown artists'. (Park 2012)

When it came to the question of chiselling into rock, England's leading letter cutter, Lida Cardozo Kinderley (2013), came to inspect the engravings, so as to authenticate the craft, by answering technical questions

as to how the art could have been made. The approach is what the cognitive psychologist Gibson (1979) calls investigating 'affordances', i.e. the action possibilities offered by a material or an environment independent of an individual's ability to recognize them. Lida is a skilled explorer of the authentic affordances offered by the rock surfaces of Valcamonica. She spent a great deal of time looking at the figures and said she could detect right-handed and left-handed artists, based on her years of stone working experience.

The minds of the prehistoric artists are clearly difficult to know, yet there is little point in falling into the academically pure but nihilist position that nothing can be known. For example, it is highly opportune that the Pitoti have not been moved from the site of their creation. This symmetry can act as a link to the past. 'Brosumer' is what Beer and Burrow call a consumer and producer combined (2010). The basic view and the fall of light across the engraving have not changed and so form the beginnings of an experiential bridge to the creators and the viewers of the art in the past. It is a point encapsulated in the network of spherical panorama photos set up by Thomas Bredenfeld for an exhibition in Milan and Cambridge (Chippindale & Baker 2012, 48–9).

The next logical step was to embrace the three dimensionalities of the art and the passage of time by making a spherical film using 360 VR (Baker & Karnapke 2016a). This built on previous efforts in story telling, for example involving ambient cinema (Baker 2007). The 3D animation of the Pitoti that were depicted with knees brought the next digital challenge (Fig. 10.4).

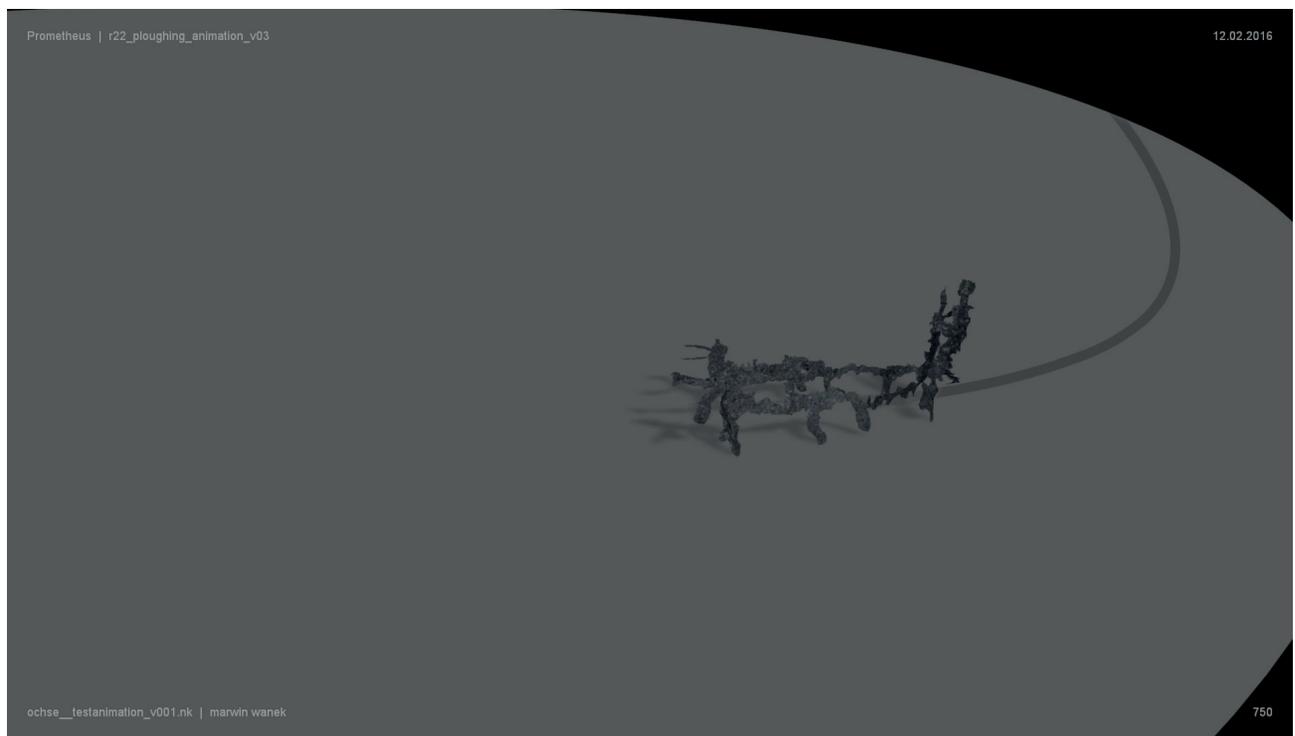
Marcel Karnapke created 3D prints from the first 3D scans of the Pitoti (2012). When shown in the exhibition (Chippindale & Baker 2012, 97), the small sculptures clearly showed the visual affinity between the aesthetics of the Camuni and modernists like Giacometti (Baker 2015).

The Pitoti are likely a form of ancient minimalism, a tradition to be seen as another form of classical art that existed in the Alps alongside the naturalism of the Ancient Greeks in the coastlands (Baker 2015). By minimalism I mean an artistic aesthetic in which a minimal number of lines is sufficient to indicate a human figure or an animal, or most interesting of all a piece of mechanical equipment.

The graphic analysis of a plough scene shows that the Camuni artists rejected a central perspective and undertook a multi-dimensional approach, which is much closer to engineering drawings. The plough is 'blown up' to show how it works and not just illustrate how it looks. Kren had first discovered the multi-dimensional approach with an engraved cart (Chippindale & Baker 2012, 83, Kren et al. 2012).



**Figure 10.4.** *'The Gladiators'*; animation production still for *'Pitoti Prometheus'* (Dir. Baker 2016).



**Figure 10.5.** *'The Plough'*; animated pre-production still from *'Pitoti Prometheus'* (Dir. Baker 2016).

A later 3D film challenge was to see if a similarly depicted plough had enough detail to be made to move realistically. As shown in Figure 10.5, the Camunians passed the test. There were enough likes to make the oxen pull the plough in the film without any additions.

The importance of this animation for our research was that it proved that in virtual reality naturalism and alienation can work together, shown by the fact that all the Pitoti figures can move anatomically and correctly if the limbs are drawn in the proper way. However, the figures are all as thin as the genuine engravings are deep in the rock. This creates a paradoxical aesthetic. Massive figures from one side and wafer thin ones from the other. This thinness was at first resisted by the animators, but as with the earlier case of the knees, has now been accepted as adding to the unique ‘alien’ look of these little puppets. The thinness has had the benefit of throwing back attention to the way in which the long shadows cast by the morning and evening light is essential to give the Pitoti their massive effect on real rocks.

In another example of VR’s mix of naturalism and alienation, the digital skeletons of Kinect systems and the Bauhaus Weimar allowed authentic human movement to be recorded and placed inside the Pitoti figures to produce a naturalism of modern motion inside a prehistoric artistic creation. I first worked with Kinect with Andreas Wappel in the editing of the Ambient film ‘Pixel to Pexel’, where the Pitoti were first coaxed to rise from the rock (Chippendale & Baker 2012, 91). The digital skeletons allow us to replace the dancers with whom we first worked at Ben Sassen’s Bauhaus Studio in 2011 and then formed part of the Pitoti Media Opera that was performed at the E.U. Researchers Night in 2011 in St Pölten. (Chippendale & Baker 2012, 89) The latest versions of this work have become a virtual museum and part of Karnapke display at the summer exhibition at the Bauhaus in Weimar (2015).

Virtual Reality systems now allow the 360-degree re-creation of locations. What started with the ambient cinema presentation of ‘Pixel to Pexel’ in the Triennale art gallery is now possible with a set of Oculus Rift Gear VR glasses, which increase the level of authenticity, since the viewer is immersed in a 360-degree filmic reconstruction of Valcamonica which is 3D within 3D, and also includes the 4th dimension – time. This makes the VR 360 film ‘Pitoti Prometheus’ (Baker & Kanapke 2016a; 2016b) both totally authentic and totally artificial, a prime example of my process of evidence-based imagination. A story (i.e. agency) that is true in a generic, rather than a specific sense, is added to the images and the archaeological space of the valley, to act out an authenticity, By that I mean Prometheus is an authentic narrative created by Hesiod at a point that

will have been contemporaneous with at least some of the Pitoti, which were created in 4000–16 BC (Anati 2008; Marretta 2008).

The VR film is an experiment in gesture and form, with the aim of performing a narrative. The goal is to provide the viewer with a narrative using the graphic language of the Pitoti. The advantage of this arts-based practice is that once this form of performance has been recreated it is easier to return to the panels and – in a form of reverse engineering – start to imagine them in terms of movement and narrative. The digital world can give life back to ancient art. This is not just in the mind’s eye, but now in both eyes, staring onto the lenses of the Oculus Rift Gear VR view.

### Conclusion

In conclusion, when it comes to understanding the nuanced nature of authenticity and the act of looking at both digital and analogue rock art, it is Giacometti the modernist heir to the Pitoti’s minimalist tradition, who has some insights worth considering:

‘The extreme position on which Giacometti based all his mature work was that no reality – and he was concerned with nothing else except the contemplation of reality – could ever be shared. This is why he believed it impossible for a work to be finished. This is why the content of any work is not the nature of the figure or the head portrayed, but the incomplete history of *his* staring at it. The act of looking was a form of prayer for him – it became a way of approaching but never being able to grasp an absolute. It was the act of looking, which kept him aware of being constantly suspended between being and the truth’. (Berger 1980 Original emphasis)

In this spirit the digital rock art is just another phase in the history of the gaze from the Camuni to the VR cinema-goers of today, suspended between the moment of being and the possible truth of what they are seeing. In this sense I was genuinely pleased at way the prehistorian Timothy Taylor reacted to his first experience of putting on the Oculus Rift head set and seeing digital Valcamonica all around him:

‘My first reaction to *Pitoti Prometheus* was copious swearing, followed by surprise when it did not echo off the surrounding mountains. I was standing in the office but my feet had gone. Below me, around me, prehistoric rock art in its geological setting.

Not quite knowing what to expect, donning the specs, I had half feared a tedious re-exposure to videogame cliché. Instead there was thrilling duality: petroglyphs, intelligently marked out in their own world, and, as they became animated, a power of proper imagination (not fantasy) conjuring the lost mythic realities of the first Alpine farmers. The afterimage has stayed, indelibly now part of my view of how the past may have been. *Proper prehistory'* Taylor pers. comm. 2017 original emphasis.

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