Thresholds. Martin Gayford.

Pictures are made with tools. This simple truth is not always acknowledged by art historians and critics. Even a brush is a piece of technology, and so too is the frayed stick with which a prehistoric person might have made an image in the interior of a cave.

Obviously, the tools that are available determine the kind of pictures that can be made. You can produce a different result with a smart phone from those you might produce with earth pigments on a rock wall. Mat Collishaw's astonishing new work *Thresholds* uses a revolutionary tool – virtual reality (VR) – that may bring about as big a change in the way we make representations of the world as any tool human beings have used in the last 30,000 years. Piquantly, it takes as its subject a similarly profound development: this is a recreation of the first substantial exhibition in Britain of photography one hundred and eighty-one years ago.

In our book *A History of Pictures,* David Hockney and I have proposed a fresh way of viewing what is often thought of as the history of art. We consider images of the world around us – what Hockey calls pictures, or depictions – not in terms of styles such as Baroque or Impressionism, nor of historical periods or national 'schools'. Instead we have investigated how pictures have been made, from the time of the cave artists tens of thousands of years ago up to our contemporary age of Photoshop and Instagram. We contend that this is a single, continuous history which includes painting, drawing and print-making but also photography, film, television and animation.

Virtual reality evidently has a place in this sequence. Collishaw agrees with Hockney's observation that the digital editing of a photograph is much the same process as drawing on paper. It involves making the same kind of choices – about how to place objects in space, for example. Furthermore, Collishaw notes that developing *Thresholds* was a similar process, in some respects, to painting or drawing. "I made a lot of intuitive decisions about the way things should be, because otherwise they looked wrong."

The History of Pictures is a single history because the challenge we face when creating a picture remains the same: how to make a compelling image of the three-dimensional, moving environment we inhabit. All that's changed over the years has been the means and tools available. As time moves on, so too has the technology available to picture makers.

For a long time, the technology remained unaltered; the media available to painters in 1400 AD were much the same as they had been in the year 400. But there can be sudden and radical shifts in what is possible. In the 15th century, a combination of Gutenberg's printing press and innovations in wood-cutting and engraving made it feasible to multiply images on a large scale. Consequently, artists such as Albrecht Dürer were able to distribute their works by the thousands; each picture identical and equal in value to the others.

Thresholds brings together two of those moments of revolutionary transformation in visual media. The earlier of these was one of the most dramatic turning points in the history of picture making. In the 1820s and 30s a number of pioneers discovered several methods of permanently fix- ing the images that could be seen in a camera obscura. The result came to be known as 'photography'; and one of its inventors was a wealthy English gentleman named William Henry Fox Talbot. The second moment is of course the one we are living in right now. Part of the 'conceit' of *Thresholds*, as Collishaw puts it, is the layering of the two moments together. The layering of time is often part of the process of making pictures; a painted portrait often condenses hours of observation into a single, static image.

In the case of *Thresholds*, Collishaw observes, "you think that you are looking at a room in 1839 but you are actually looking at this new technology: the screen is an inch away from your eyes". So you

are not only put into a sort of time machine – transported back almost two hundred years into a time and place that no longer exists – but also forcibly reminded that you are experiencing an illusion.

One journalist, Gaby Wood, writing in *The Daily Telegraph*, described the effect as "impressive and magical". It was not, she felt, like wearing 3D glasses, which you know will affect your vision, but more like actually walking through the Palace of Westminster – which was de- signed by the same architects, Charles Barry and Augustus Pugin, as King Edward's School, Birmingham – where Talbot's exhibition of the images made with his epoch- making discovery took place. "The ceilings are high and grand; the adjoining rooms stretch out beyond the one you're in". Another account, by Laurie Taylor in *Frieze* magazine, concluded that the experience was "unique and strange, even slightly unnerving – perhaps not unlike the feeling experienced by viewers of those first photographs in Birmingham".

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While there's a dearth of first-hand accounts about the exhibition in Birmingham, we know how Talbot's collaborator, Sir John Hershel, responded to the photographs made by Daguerre (Talbot's rival) in January 1939. "It is hardly saying too much", he wrote to Talbot, "to call them miraculous".

Wonder is often the initial reaction to a step-change in picture-making. Classical texts describe how ancient Greek artists caused amazement because their pictures were sufficiently realistic to fool the viewer. Birds allegedly tried to peck at the grapes painted by Zeuxis, but he in turn was upstaged when he tried to pull apart the curtains in a picture by his rival Parrhasius. The first people to see the 12th century mosaics of Monreale in Sicily or the frescoes by Giotto in Padua, David Hockney suggests, would have been amazed not so much by their artistry as by their realism.

Someone who had never seen a photograph would have felt a similar amazement upon visiting Talbot's display at the King Edward's School and seeing these tiny, often faint traces made by light on pieces of paper. But how, Collishaw asks, to bring that home to visitors in an era in which "kids are talking to friends in Los Angeles, and seeing the people they are calling, when they are sitting on the bus?" One way to do so is to create an effect that is equally startling to a contemporary viewer. Collishaw has done this by going one step beyond 'standard' VR – with which the kids on the bus can be assumed to be familiar. "The intensity of VR is outstanding but when you try to touch what's there everything falls apart; you realise it's just an image". So Collishaw decided to "add a few other elements to the experience that convinced you that you were in this room in 1839, ways of stimulating the other senses, suggesting that you are actually inside this simulation". The only other attempt to do this he has seen is a "shoot-em-up game with monsters" made by a firm in Salt Lake City.

The illusions of touch and temperature he has created may be less dramatic than the video game, but they're so carefully crafted as to be utterly convincing. Not only can you feel the shapes of the display cases in which Talbot's works were shown, you can feel the qualities of the materials that were used: "the main structure of these vitrines are made of wood so they feel textured and slightly warm, but the tops are metal so they are harder, smoother and colder to touch".

This is not a pedantically accurate facsimile of that vanished room in Birmingham. In the past, pictures have often been falsified to create a greater sense of verisimilitude, which was one of the objections the philosopher Plato had to the new, realist art of the 4th century BC. The columns of a temple do not actually get smaller, he complained, just because they are further away from you.

"You sometimes have to cheat a little bit", Collishaw notes, "to make things look right. Sometimes the lie looks more convincing." That's true of painting or drawing and also of the process of constructing *Thresholds*. "I was making something that looked convincing to an ordinary person, not someone estimating the quantity of lumens that would have been given out by an early 19th century

gas chandelier. So I tried to adjust the virtual world to something that appeared to be more like my own, real world."

Although every attempt was made to fashion a complete sensory illusion, at the same time everybody who enters the environment of *Thresholds* is of course completely aware that this actually is an illusion. Before doing so, they have the opportunity to observe others undergoing exactly the same experience. "It looks a little like a performance going on", Collishaw reflects. "It's almost like a strange scientific experiment being conducted, with everything white, very clean, no textures. People wander around like insects with antennae, trying to gauge where everything is".

The skill required to create an illusion is fundamental to the history of pictures, and to other forms of art. Hockney gives an example of how this skill can be applied in theatrical productions (another kind of picture). "In Zeffirelli's production of *La Bohème* at the Metropolitan Opera in New York, the first act is a little rooftop studio. Then the curtain goes down for thirty seconds, and when it comes up there's a whole street in Paris with three hundred people on stage. The audience just loves it; it's a fantastic thing and a real spectacle. That's why Zeffirelli gets applause". In a film, however, the change in scene would just be a cut, and no one would be impressed. The applause is partly because everyone knows how difficult that scene change must be to devise and organise.

The deeper message of *Thresholds* is perhaps not so much that there is an astonishing illusion, but that everything we experience is just as illusory. The 18th century philosopher Immanuel Kant maintained that everything we experience –the 'objects of sense'–are 'mere appearances' and these do not reveal what the world around us is really like. *Thresholds* is a metaphor for this hypothesis. Through the VR headset come the illusions that we call reality.

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Outside the windows of the recreated room in *Thresholds* an angry demonstration takes place. A crowd of Chartists demand an end to political corruption, the introduction of democratic reforms and a widening of the electorate from the tiny proportion who could take part in British elections. One of the underlying causes of this movement was technology. In the 21st century many workers may be replaced by artificial intelligence, similarly in the early 19th century many traditional jobs were taken over by machines. As has often occurred throughout history, a new tool caused great destruction as well as tremendous creation (the printing press had the same effect in the 16th century, spreading ideas and information but also violent religious dissension).

Ingenious inventions, such as the steam train, were among the reasons why the Chartists were protesting in Birmingham in the summer of 1839, and doing so with such vehemence that troops stood by to keep the peace. Talbot was understandably alarmed by this unrest, he was money, law and the nation state that has made homo sapiens such a successful species. Pictures and three dimensional images have made such fictions visible and believable. Statues of the gods were carved and moulded; in some traditions the gods supposedly inhabited their sculptures. Religious and mythological narratives were presented in images that, to their original audiences, probably seemed as vividly real as television. In the 20th century, cinema and TV became the most powerful tools of mass communication ever to exist. And both, of course, even when dealing with news and 'documentary reality' can be as fictional as any old master painting or medieval fresco.

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Thresholds is by no means the first work of Collishaw's to offer a visual comment on art history. Collishaw held an exhibition at the Galleria Borghese in Rome, in 2014, titled *Black Mirror,* comprising two components. One took the form of a reconfiguration of three paintings by Caravaggio from the Borghese collection. He took these images; *Saint Jerome Writing, The Madonna and Child*

with St. Anne and David with the Head of Goliath, and animated them subtly so that the figures stirred slightly from their fixed poses.

These moving pictures were then screened behind two- way mirrors housed in elaborate Murano glass frames, so when the image was not on view the framed rectangle was dark. The effect emphasised that Caravaggio worked from real people, posed in his studio, in a manner that, as Collishaw noted, looked 'photographic'. Hockney and I argue that he might well have been using the equivalent of a camera to project what he saw on the canvas.

Caravaggio certainly also used mirrors – a large one was listed in an inventory of his studio. In fact, mirrors have played a crucial role in the history of pictures. A reflection was the first virtual reality – seen by the earliest humans in the surface of a pool, by ancient Greeks and Egyptians in polished bronze, by Renaissance artists such as Van Eyck and Parmigianino in silvered glass. One of the objectives of realist pictures was to match the images seen in mirrors – Alberti and Vasari both recommended them as aids to painters.

Furthermore, the idea of somehow fixing the image to be seen in a mirror was a fantasy that long preceded the invention of the photograph. Together with the parallel dream that it might be possible somehow to freeze the pictures to be seen in a camera obscura, it led directly to the discovery of photography. In 1760 the poet Thomas Gray wrote to a friend that in his Claude glass – a type of black mirror – he'd seen a picture "that if I could transmit to you, and fix it in all the softness of its living colours, would fairly sell for a thousand pounds". Talbot himself wrote a poem, published in 1830, titled The Magic Mirror, in which he fantasised about an enchanted looking-glass where the reflection of a marvellous landscape was preserved forever. A couple of years later, he considered that there maybe a chemical method of making camera images into lasting images.

In such ways is the history of pictures interwoven. Techniques come and go, but the aims remain the same. Another, which Collishaw touched on in his Galleria Borghese exhibition, was the effort – which goes back to the paintings in prehistoric caves–to make a picture which seemed to move. Several of the most celebrated works in the Borghese collection are baroque sculptures by Gian Lorenzo Bernini, which aim to do just that. His Apollo and Daphne is a piece of marble carved with fabulous skill to represent the split- second in which the god catches the nymph and she turns into a tree. It's a three-dimensional freeze frame.

For his other work at the Galleria Borghese, Collishaw was inspired by the much less celebrated picture of the Massacre of the Innocents by Ippolito Scarsella or Scarsellino (c.1550-1620). Collishaw translated the naked figures in this minor mannerist painting into something more than a frozen moment of action: he made it into a brief sequence of sculpted film. To do this he used the zoetrope, a piece of visual technology from the same historical point as Talbot's early photographs.

The zoetrope was invented in the early 1830s, just as Talbot was attempting to fix a camera image. Like photography, it was devised by several individuals more or less simultaneously, in this case, Austrian, Belgian and British mathematicians. The instrument published by the Briton, William George Horner in 1834 consisted of a cylindrical drum with regularly placed viewing slits. On the inside surface were a series of images depicting different stages of an action. When the cylinder revolved, the picture came jerkily to life.

One could say the zoetrope was a precursor to the discovery of cinematic projection at the end of the 19th century. It is, like Talbot's photographic technique, an archaic apparatus from a past chapter of the history of pictures. Or it was, at least, until Collishaw took it up and turned it into a novel medium.

All Things Fall, the zoetrope shown at Galleria Borghese, is a revolving carousel, loosely based on the architecture of Bramante, and populated by the naked, 3D printed cast of frantic mothers, doomed babies and murderous soldiers, in a horrific scene. As the mechanism turns and the strobe light

flashes, the executor's sword falls rhythmically, again and again. It emphasises that the subject matter of old master painting and sculpture, though disguised by the hallowing effect of time, is frequently terrible. The celebrated works at the Galleria Borghese by Bernini and Caravaggio deal with rape, death and decapitation. *All Things Fall* brings the horror, almost literally, to life.

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Until recently, though it had become more sophisticated, photography remained essentially the same medium that had been developed by those including Talbot in the first half of the 19th century. It was a system for preserving the traces made by light on a sensitive surface, using chemicals. Now, while a few enthusiasts still prefer film, that process is as outmoded as making pictures with a lithographic stone.

Digital media have replaced photography, triggering a series of fundamental shifts in the nature and use of images. A photograph was something you might put in a frame and hang on the wall – a successor to a hand-painted oil or watercolour. The pictures taken on a smartphone seldom have any physical existence at all – that is, they are not often printed, let alone framed. Instead, they are a form of virtual communication, intended to be exchanged or posted on social media to convey a message such as "I'm on holiday!" or "This is the meal I'm about to eat".

The advent of virtual reality is a development with even deeper implications. It marks the culmination of a quest that has been underway since the early 15th century, when the Florentine artist and architect, Filippo Brunelleschi, devised the first piece of immersive visual technology. It was admittedly low-tech in comparison to the digital VR of today. But its goal, and even its form, were similar.

Brunelleschi painted a depiction of the Baptistery in Florence as seen from a certain point just inside the doors of the cathedral in what came to be called 'perspective'. This was executed on a small wooden panel with a polished silver surface – in other words, a mirror. Brunelleschi also fashioned another panel with a reflective surface, and a small hole in its centre. The viewer held the first panel in one hand a small distance away, and peered through the little hole in the back of the other.

According to surviving descriptions –the little panels themselves disappeared over 500 years ago–the experience was startlingly similar to actually standing in front of the Baptistery. If the observer stood outside, the mirrored sur- face above the painting of the building reflected the clouds drifting across the sky above. This was, therefore, a predecessor of film, as well as the first known attempt at VR.

Of course, computerised VR is different in one fundamental way. You can move around in it – as if the Re- naissance connoisseurs holding Brunelleschi's small panels could have seen the Baptistery from various angles, close up and far away. In this respect it is fundamentally different to almost anything else in the history of pictures. (The only rough parallels to VR in this respect are the trompe l'oeil paintings of the Renaissance and Baroque periods in which the actual walls of a room are extended by virtual architecture and painted landscapes, but when the viewer moves the illusion is destroyed because the perspective ceases to be convincing). On the other hand, digital VR is exactly like Brunelleschi's work in that both require an apparatus to be placed close to the spectator's face.

The two have another crucial resemblance which is the shared basis of all pictures from the caves to VR, that they are – inherently – virtual. That is, you don't feel the objects in them. Someone holding Brunelleschi's panels could not reach out and feel the columns of the Baptistery, nor could they have proprioception – that is, the sense of the position of their own bodies relative to the objects they are seeing. Similarly, someone wandering through a virtual desert would not feel the heat of the sun in the sky above.

In *Thresholds*, Mat Collishaw has created something as innovative as Brunelleschi or Talbot did. He has made a virtual environment through which you simultaneously move in actual, non-virtual space,

in which you can touch the surfaces you see and feel the heat of the virtual fire burning in the illusory wall. It is an extraordinary conceit – to use a word Collishaw himself employs – a comment on the nature of pictures that at the same time piquantly superimposes two points of radical change; the early 19th century and the early 21st.

The point Collishaw is making here is that the history of pictures is a continuum. For millennia, since the era of the caveman, there have been recurrent efforts to make human images of the world more real. Bernini and Caravaggio were part of that, so too were Talbot and the inventors of the zoetrope. Hollywood, Walt Disney and 21st century virtual reality all belong in this linear history too. It's ongoing, and what we create today is still part of it.