



## Notes on *camera obscura*: three contemporary artistic perspectives on the path of photography<sup>1</sup>

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**Abstract.** In 1971, American artist Rockne Krebs presented an immersive artwork composed of the optical phenomenon of the *camera obscura*, among other elements. Although this artist appears to be the first interested in this phenomenon, it was only from the 1990s onwards that the artistic practice of *camera obscura* as room installation became widespread. In the decades since, several authors have included it in their production—developing projects of a photographic nature through different approaches, mainly focusing on projected image or spectator participation. Through the method of media archaeology, it is possible to find three lines of contemporary artistic research on the phenomenon: *camera obscura* related to meta-photography in Cuban-born American photographer Abelardo Morell's works; immersive installation pieces as proposed by American artist Zoe Leonard; and projections of other worlds in the work of the Portuguese artistic duo João Maria Gusmão and Pedro Paiva. This paper aims at a comparative study that intends to analyze these three paths, underlining the characteristics of some contemporary artworks and contextualizing their elements to the history and use of *camera obscura* in the photographic context.

**Keywords:** *Camera obscura*; contemporary art; installation; Media Archaeology; photography

### [es] Notas sobre la *camera obscura*: tres perspectivas artísticas contemporáneas sobre la trayectoria de la fotografía

**Resumen.** En 1971, el artista americano Rockne Krebs presentó una obra de arte inmersiva compuesta por el fenómeno óptico de la *camera obscura*, entre otros elementos. Aunque el artista parece ser el primero en interesarse por el fenómeno, la práctica artística de la *camera obscura* como sala se generaliza sólo a partir de 1990. En las décadas posteriores, varios artistas la han incluido en su producción, desarrollando proyectos de carácter fotográfico a través de diversos enfoques; las piezas se centran principalmente en la imagen proyectada o con la participación del espectador. Sin embargo, utilizando el método de la Arqueología de los Medios, es posible encontrar tres líneas de investigación artística contemporánea que envuelven este fenómeno óptico: la *camera obscura* relacionada con la meta-fotografía en la obra del fotógrafo cuba-americano Abelardo Morell; piezas de instalación inmersivas propuesta por la artista americana Zoe Leonard; y, proyecciones de otros mundos en la producción del dúo artístico portugués João Maria Gusmão y Pedro Paiva. Este ensayo se presenta como un estudio comparativo que analiza estos tres caminos, subrayando las características de algunas obras de arte contemporáneas y contextualizando sus elementos en la historia, así como el uso de la *camera obscura* en el contexto fotográfico.

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**Palabras clave:** *Camera obscura*; arte contemporáneo; instalación; Arqueología de los Medios; fotografía

**Summary:** 1. Introduction. 2. *Camera obscura* as room. 3. When exterior becomes interior: meta-photography. 4. Immersive installation activates temporal and relational experience. 5. The projected image confuses real and fiction. 6. Conclusions. References.

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## 1. Introduction

At first sight, a coastal landscape takes shape in the photographic image: a blue sea where patches of vegetation stand out on dark rocks, in contrast to a clear sky in gray afternoon light. Then, traces of an interior appear: a door, a switch, two electricity sockets, and, at the bottom, a baseboard. In another artwork, a large and completely dark white cube room is invaded by a projection: bricks and glass buildings expand on the floor and walls, while near the ceiling of the room, a street with some trees and parked cars emerges. Finally, in a different piece, a bizarre image is projected in a corridor: a portion of the desert with some cacti and a lamp. The projection requires long observation by the spectator as the light intensity of the lamp changes, recreating atmospheric effects such as the passage from day to night.

These are pieces by contemporary artists, respectively: *Camera Obscura: Afternoon Light on the Pacific Ocean. Brookings, Oregon, July 13th, 2009* (2009) by Cuban-born American photographer Abelardo Morrel; *453 West 17th Street* (2012) by American artist Zoe Leonard; and *A Lamp in the Desert* (2012) by Portuguese artistic duo João Maria Gusmão and Pedro Paiva. All these artworks have a common element that permits gathering them together: the well-known optical phenomenon of the *camera obscura* as room. Starting from this phenomenon, these contemporary pieces seem to point in divergent and contradictory directions, designating unusual aims distant from those of the canonical understanding of the *camera obscura*. Despite belonging to the same category, these artworks lead to a questioning of the possible continuities in the use of this phenomenon and underline their relation with other media, namely photography.

To investigate these dimensions concerning the *camera obscura* and photography within contemporary practice, a media-archaeological methodology will be used. Even though its limits and several approaches are not easily determinable, this research arises from the broad field of media studies, due to widespread concern and, as Finnish media historians Erkki Huhtamo and Jussi Parikka (2011, p. 3) emphasize, “[d]iscontent with ‘canonized’ narratives of media culture and history”. Media archaeology presents itself as a methodological investigation of contemporary culture through the analysis of relations with past media, revealing mechanisms, techniques, and inventions, but also practices and experiences, that are discontinuous and omitted from canonical narratives.

Though media-archaeological thought began at the end of the last century, archaeological studies dedicated to the photographic image are limited. Recently, Hu-

hmato (2018, p. 14) has warned that “a handful of researchers have moved in this direction, without identifying their work as ‘media archaeological’. There are no clear guidelines for how media archaeology could be made productive as a tool for investigating photography”. Similarly, there is also a gap in studies on the *camera obscura* as room in contemporary art criticism: few authors have taken into account its current artistic use. Applying a media-archaeological methodology on this optical phenomenon, this paper intends to undertake research that intersects the *camera obscura* and the photographic, that is, the characteristics derived from photography and used in other media: the optical phenomenon will be seen less from a perspective of continuous technological advancement and more as a possibility of returning, intertwining, reformulating, and expanding—in relation to the history of photography.

## 2. Camera obscura as room

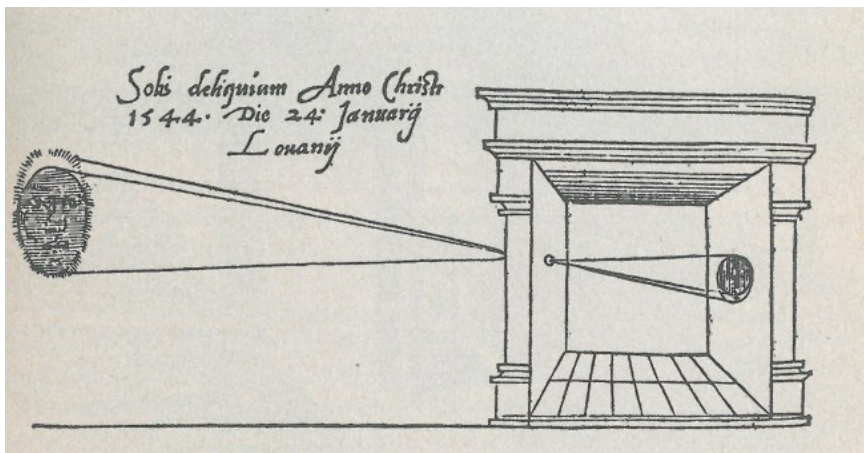


Figure 1. An illustration of the *camera obscura* phenomenon during the solar eclipse at Louvain on 24 January 1544. From Reinerus Gemma-Frisius’ *De Radio Astronomica et Geocentrico*, 1545.

The *camera obscura* is a simple optical phenomenon that produces an image projection: in a totally dark, closed space, light enters through a small hole, called a pinhole, forming an inverted image – upside down and left to right – on the opposite surface (Fig. 1). This occurrence has been known since ancient times. Its first reference appears in the book *Mo Tzu*, a collection of Chinese philosopher Mozi’s teaching (5th century B.C.), in which he gave his testimony of this kind of inverted projection. During the Classical period, in the Aristotelian-inspired book *Problemata*, the author pondered why, during a solar eclipse, the light rays that seep through small openings—such as between leaves or crossing fingers—create a half-moon image of the eclipse (Forster, 1927, p. 912b). This shows that the optical phenomenon was observed both in outdoor situations and in a completely dark environment. Although philosophers and scientists had already been questioning the light principles for thousands of years, proofs of the constitution of the *camera obscura* as room do not exist at least until the Middle Ages (Mannoni, 2000, p. 4). In the 11<sup>th</sup> century, Arab

philosopher Ibn al-Haytham, well-known as Alhaizen, described in his book *Kitab al-Manazir (Book of Optics)* the impression that the light rays travel in a straight line when observing the images projected, according to legend, in his Bedouin tent.

Figure 2. Representation of the *camera obscura*. From James Ayscough's



*A Short Account of the Eye and Nature of Vision*, 1755.

In this brief essay, a complete historical chronicle of the optical phenomenon will not be undertaken<sup>3</sup>. It is enough to report its main uses: scientific and artistic<sup>4</sup>. The first refers to the use of the *camera obscura* to observe phenomena indiscernible to the human eye, e.g., solar eclipses<sup>5</sup>, or to assess the similarity between this optical phenomenon and the function of the eye itself. Among the scientist of the modern age, in his *Codex Atlanticus* (1478-1519), Florentine Leonardo da Vinci was the first to compare the function of the eye with the *camera obscura*—the crystalline is an aperture for which the light rays enter up to the retina, forming an image upside down and left to right of the world<sup>6</sup>. Furthermore, da Vinci recommended in his notebook the use of an “extremely thin” paper (Da Vinci, 2008, 110), almost transparent, to observe the image of the *camera obscura*—the projection would be in its true orientation, but still upside down. Interested in the phenomenon was also the German astronomer Johannes

<sup>3</sup> For an in-depth study about *camera obscura* reference works are: *The Camera Obscura: a Chronicle* (1981), by John H. Hammond; *The History of Photography: From the Camera Obscura to the Beginning of the Modern* (1955), by Helmut Gernsheim; and, *The Great Art of Light and Shadow: Archaeology of the cinema* (2000), by Laurent Mannoni.

<sup>4</sup> The military function is not commonly referred to. Hammond expands it in his book, namely in relation to the 19<sup>th</sup> and 20<sup>th</sup> centuries (Hammond, 1981, p. 105-106, 152-155).

<sup>5</sup> Many scientists have used the *camera obscura* to observe solar eclipses: Ibn al-Haytham in 11<sup>th</sup> century, English philosopher Roger Bacon and priest John Pecham in 13<sup>th</sup> century, French philosopher Levi Ben Gershon in the 14<sup>th</sup> century, Sicilian mathematician Francesco Maurolico and Dutch physician Gemma Frisius in the 16<sup>th</sup> century, among others.

<sup>6</sup> There are other important authors such as: Neapolitan scientist Giambattista Della Porta in *Natural Magick*, German astronomer Johannes Kepler in *Ad Vitellionem Paralipomena* and French philosopher René Descartes in *La Dioptrique* (1637).

Kepler, that first named it as *camera obscura* (dark room)<sup>7</sup> in his book *Ad Vitellionem paralipomena* (1604). Although scientist have corrected, from the 16<sup>th</sup> century, the image projection introducing a lens<sup>8</sup>, Kepler improved the *camera obscura* through some lenses that permit to have enlarged images. He has also introduced two biconcave lenses that allow us to straighten the projected image, as he described in his book *Dioptrice* (1611). During the 16<sup>th</sup> and 18<sup>th</sup> centuries, the association between the human eye and the *camera obscura* became part of a philosophical understanding—that the phenomenon would represent an objective projection of the real world that met human individuality. For American art critic Jonathan Crary (1990, p. 41-42), canonical understanding of the structure of thinking and knowing until the 18<sup>th</sup> century was considered, according to this optical phenomenon experience, as the encounter between the projection of the objective world and individual subjectivity.

The artistic use of *camera obscura* has been attested for several centuries for studying and assisting in drawing, related to the exercise of copying the real through the perspective rules (Fig. 2). Although perspective studies were (re)established during the Renaissance, historians are not sure that artists used *camera obscura* in the 15<sup>th</sup> century—Florentine Leon Battista Alberti and German Albrecht Dürer “developed techniques and apparatuses for drawing in perspective and foreshortening, but neither actually referred to the use of the camera obscura” (Hammond, 1981, p. 40). Only in the mid-16<sup>th</sup> century the phenomenon is aforementioned in optical essays and seems to be used by several artists, like Dutch Jan Vermeer, Venetian Giovanni Antonio Canal (well known as Canaletto) and English Thomas Sandby, among others.

In the various descriptions from the 11<sup>th</sup> century onwards, the *camera obscura* as room remained essentially composed of a dark space and a hole. As, it was noticed, only in the 16<sup>th</sup> century a change took place—the pinhole was provided with lenses to improve the quality and focus of the projected image. In the following century, the optical phenomenon was applied to portable devices<sup>9</sup>, that is, optical instruments used in the artistic field for observing and copying reality to create drawings and paintings. Simultaneously, the *camera obscura* as room was utilized in other spaces and from the 17<sup>th</sup> onwards it no longer belonged solely to the artistic or scientific fields. Until the 19<sup>th</sup> century, its main purpose was for private and public entertainment—English poet Alexander Pope had one in his dwelling in Twickenham (USA), while clergyman Benjamin Hoadly, in his house in Chelsea (UK), had a pentagonal space made up of five projections. Regarding its public use, American historian John H. Hammond (1981, p. 104) notices that “there is no little doubt that during the nineteenth century the camera obscura reached the height of its popularity”. Some public structures from that time have survived to the present day, such as Camera Obscura and World of Illusions in Edinburgh, built in the 1830s<sup>10</sup>.

<sup>7</sup> Until the 17<sup>th</sup> century, it had several names, among them *oculus artificialis*, used by Leonardo da Vinci in his book *Codex Atlanticus* (1478-1519), or *cubiculum obscurum* used by Giambattista Della Porta in his *Natural Magick* (1558).

<sup>8</sup> For example, in the book *De Subtilitate* (1550), Milanese physician Gerolamo Cardano describes the use of a lens for improving the focus and sharpness of the *camera obscura* projection.

<sup>9</sup> From the 17<sup>th</sup> century onwards, some reports describe various types of portable *camera obscura*: Kepler’s tent-camera; small boxes illustrated by German scientist Gaspar Schott in his book *Magia Universalis* (1657); or the devices of German inventor Johann Zahn in *Oculus Artificialis Teledioptricus sive Telescopium* (1685), that is, optical instruments that are predecessors to current reflex-photographic cameras.

<sup>10</sup> Other public *camerae obscurae* appear prior to the 19<sup>th</sup> century, such as broughams in the 18<sup>th</sup> century or the room built in Paris in the 1630s, since destroyed by urban development.

Entertainment had remained the primary use for *camera obscura* as room until the 1990s, when interest in its artistic potential was reignited within contemporary circles. As Eric Renner (2009, p. 107) states, “making *camera obscura* was in the air”. Contrary to previous artistic practice, the *camera obscura* as room was no longer merely a structure for copying reality—the artistic paradigm had been transformed, as demonstrated in American artist Rockne Krebs’ prescient works of the 1960s and 1970s. This artist expressed mainly through sculpture and installation, being a pioneer in the use of laser since 1968. Among his pieces, there is *The Lock (Home on the Range, Part III)*, from 1974, an installation created at Minneapolis Walker Art Centre and composed of a *camera obscura* projection, a laser structure, reflective varnishes, artificial grass, plants, and mirrors (Fig. 3). This artwork is part of Krebs’ ideas that, based on sculptural practice, expand the research into the visual and visibility. He was interested in natural light with the intention of exploring optical properties. Thus, Krebs rediscovered the old *camera obscura* phenomenon and from 1971 onwards used it in his immersive installations, called “obscure paintings”. *The Lock (Home on the Range, Part III)* also contains an interpretive allusion in its title: through a hole with the size of a lock, a two-dimensional image is formed as an extension of the outside world into the inside space. In this piece, the inverted projection is intertwined with other elements such as laser lights and mirrored surfaces that disrupt and animate the environment. This experience recalls the suggestion of Hungarian vanguard artist László Moholy-Nagy (1969, p. 26) who wished for kinetic compositions designed with “interpenetrating beams and masses of light floating freely in the room **without a direct plane of projection** [emphasis author’s]”. The combination of various elements in Krebs’s works constitutes a first revisiting of the *camera obscura* in artistic practice through an immersive experience that bears resemblance to the entertainment path<sup>11</sup>.



Figure 3. Installation view of *THE LOCK (HOME ON THE RANGE, PART III)*, 1974, by Rockne Krebs, in *Projected Images*, Walker Art Center, 1974.

Credit: Eric Sutherland for Walker Art Center, Minneapolis, MN, USA.

<sup>11</sup> From 1971, also the Japanese artist Nobuo Yamanaka made experiences with *camera obscura*, but his installations were, in most cases, not accessible, producing just photographs.

In the last three decades, there has been a proliferation of the employment of *camera obscura* in art installations: the old optical phenomenon as projection is revisited and also subverted of its historical function in the artistic field, in favor of other dimensions and paths. Numerous artists employ it: Icelandic–Danish Olafur Eliasson, French Alain Fleischer, German Vera Lutter, and Israeli Maya Zack, to name a few. If, as Renner (2009, p. 107) states, “each camera obscura requires a different type of participation”—because, in his view, each artist makes different use of *camera obscura* to take pictures—, then, among the contemporary artworks above, some common lines refer other functions of these phenomenon—now forgotten and disappeared. Three among these works will be analyzed in the following pages: the *camera obscura* related to meta-photography in Abelardo Morell’s works; immersive installation pieces proposed by Zoe Leonard; and projection of other worlds in the work of the artistic duo João Maria Gusmão and Pedro Paiva.

### 3. When exterior becomes interior: meta-photography

The changes that transformed the *camera obscura* into a portable optical instrument appeared in the second half of the 17<sup>th</sup> century. As Helmut Gernsheim (1955, p. 27) points out, “in 1685 the camera was absolutely ready and waiting for photography [emphasis author’s]”. This relationship between the *camera obscura* as a portable instrument and the photographic device was emphasized by critics resulting in a concealment of the phenomenon as room dimension. In the canonical manuals of photography history, such as *History of Photography* by Beaumont Newhall (1993, p. 9), one can read reductive expressions like the following: “the camera obscura, at first actually a room big enough for an artist to enter was useless until it became portable”. These author’s words are part of a perspective on technological progression that frames the *camera obscura* as room as a remote, incomplete, and useless predecessor to photographic cameras. From the 17<sup>th</sup> century onwards, due to its portability, the *camera obscura* was no longer experienced as a visitable space in which a projected image can be observed, but rather as an instrument for the reproduction of reality.

A similar position appears within the contemporary practice of *camera obscura* as room installation. Consider the peculiar case of Abelardo Morell, who has been using the *camera obscura* since 1991, with his first experiments at his home in Quincy, Massachusetts (USA). This photographer uses several photography techniques, such as classical gelatin silver print, tintype, collodion process, or media as tent camera, in an aesthetics discourse that blends image, reflection and projection. Moreover, Morell has made several *camerae obscurae* known through the photographic images he has created<sup>12</sup>: dark environments, obtained by covering windows of living rooms, offices, or hotels, allow the formation of projections, which are then photographed by the artist. Nevertheless, the *camera obscura* as room seems to become an expedient to thought about our relationship with projection and its relationship with the world, through the printed image that represents the optical phenomenon itself.

<sup>12</sup> Morell’s *camerae obscurae* as immersive installations were just a few. American curator Matthew S. Witkovsky (2015, p. 114) refers, for example, to the one organized at Yale University Art Gallery in 1998, and another at the library of Andover College, in 2002.

This play between the projection and the photographic image is already manifested in the title of his first photograph: *Camera Obscura Image of Houses Across the Street in Our Living Room* (1991). Its descriptive name reveals how the projection process at the base of the image belongs to the optical phenomenon of *camera obscura*.



Figure 4. Photograph by Abelardo Morell. *Camera Obscura: Times Square in Hotel Room*, 1997. Courtesy of Edwynn Houk Gallery, New York.

In many of this artist's photographs, there is a certain intimacy between the projected image and the environment. For American art historian Kaja Silverman (2015, p. 40), this derives from the presence of Morell's everyday furniture: a more personal relationship between the inhabited spaces and the real, interiorized world is constituted in the images. Although intimacy recurs primarily in his early photographs—making the *camera obscura* in hotel rooms—Morell's subjective daily life is depersonalized: images such as *Camera Obscura: Times Square in Hotel Room*, from 1997 (Fig. 4) do not provide a singular interior space, but rather a “non-place”, to use French anthropologist Marc Augé's expression. According to this author, our contemporaneity is replete with “non-places”, that is, venues like airport, railway stations, and hotels, which are used by everyone without establishing particular affective or relational bonds (Augé, 1995, p. 94-95). Thus, aseptic, emptied contemporary environments complement Morell's everyday spaces, intersecting with the projection of the outside.



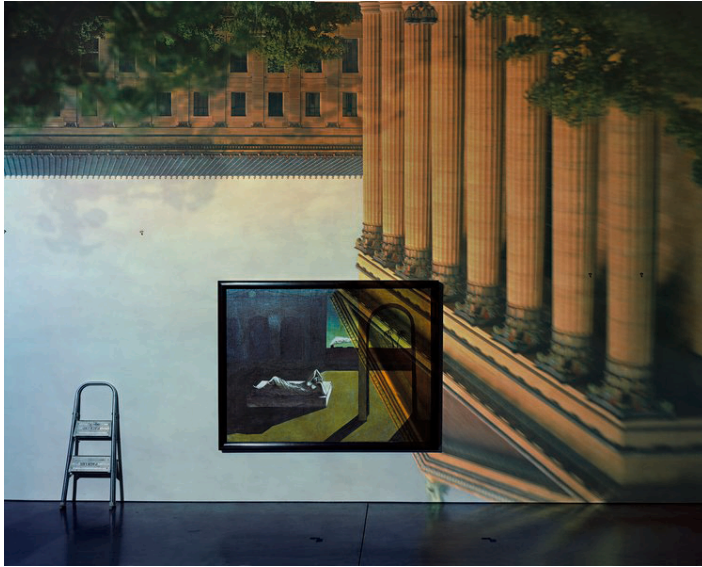


Figure 5. Photograph by Abelardo Morell. *Camera Obscura: Image of the Philadelphia Museum of Art, East Entrance in Gallery #171 with a de Chirico Painting*, 2005. Courtesy of Edwynn Houk Gallery, New York.

The choice of framing also becomes an important aspect. The artist has a predilection for well-known monuments, such as the Eiffel Tower in Paris and Times Square in New York, or places with a particular cultural reference<sup>13</sup>. The rooms are loaded with a visual layer that mixes the elements and various surfaces, making a clear and immediate differentiation difficult: the spectator's gaze cannot simultaneously distinguish the two components—interior space and projection—but just sees them mixed up. An optical effect is constituted, similar to the illusion of ambiguous figures. This effect becomes a formal play in some images such as *Camera Obscura: Image of the Philadelphia Museum of Art, East Entrance in Gallery #171 with a de Chirico Painting*, from 2005 (Fig. 5). Here, as the title points out, it shows the interior room of the Philadelphia Museum, where a painting of Italian artist Giorgio De Chirico is hanging on the wall. A formal harmony is performed between the projection of the museum's exterior of neo-Greek inspiration and the Italian classicist elements of the metaphysical atmosphere of De Chirico's work.

In summary, Morell's *camera obscura* works are processes that, when recording the optical phenomenon with a camera, result in a sort of meta-photography: a visual play that duplicates the function of the technical image through its own components. If Morell's images recall a technological evolution perspective relating the *camera obscura* to the photographic instrument, a temporal short circuit is disclosed when he photographs these same latent projections: the artist is not just interested in the technology itself, but through the process of image formation—used also in current analog and digital cameras—brings the spectator back to the primordially of the optical phenomenon.

<sup>13</sup> Witkowsky (2015, p. 114) points out, for example, that “the Golden Gate location was a homage to Hitchcock's *Vertigo*” or “the Andover library recalled for Morell the Thornton Wilder play *Our Town*”.

#### 4. Immersive installation activates temporal and relational experience

While certain artists use the *camera obscura* as room to take pictures, others are more involved in exploring the phenomenon as an immersive environment, while still referring to the photographic field. In his essay “Photography, encore”, British curator David Campany proposes various possibilities for rethinking the photographic—among them the *camera obscura*. According to him, by using the optical phenomenon, artists engage in a discussion about the depiction of the space through conventions of realism (Campany, 2014, p. 23), while the contemporary *camera obscura* as room also intervenes in the physical experience of the spectator. Vera Lutter (2003) states that the “first time I created a camera obscura, after I had realized how long I had to sit in there to adjust my eyes to the darkness, to see the projection, which is about 20 or 30 minutes—[...] it was an epiphany”. This highlights another main aspect of the optical phenomenon beyond the photographic image: that the former works are “essentially about the passage of time, not about ideas of representation” (Lutter, 2003).

Even though the *camera obscura* was seen as an individual space because it “necessarily defines an observer as isolated, enclosed, and autonomous within its dark confines” (Crary, 1990, p. 39), contemporary installations provide an experience that can be shared by several viewers. As mentioned above, in order to see the projection, the spectator needs some time to perceive the image on the wall and adapt to the dark environment: at first, they are still isolated, losing the intuitive notion of space and the subconscious movements of their body therein. Only then, when the senses are accustomed to darkness, is the spectator faced with the presence of other people. An ambivalent temporal dimension is therefore revealed: one intrinsic to the latent image—since the *camera obscura* projection includes, in real time, movements of the outside world—the other linked explicitly to the spectator’s durational experience in the space as they visualize the image.

The works created by Zoe Leonard between 2011 and 2014<sup>14</sup> include these temporal aspects. Her artistic activity is based on photography, sculpture and installation, providing the spectator social patterns for questioning our practices and interactions. In her pieces, she also used the *camera obscura* as room, but, unlike Morell, these works focus on spatial and temporal experience: Leonard chooses non-residential buildings—galleries, factories—for her dark rooms; the projections do not present known monuments, but instead “common” landscapes, as in *945 Madison Avenue* (2014) of *2014 Biennial* at Whitney Museum of American Art of New York (Fig. 6); and her installations are directly experienced by the spectators, not mediated by photographs. Leonard’s environment appeals to the historical entertainment dimension of the *camera obscura*. As Hammond indicates, “the large room-type camera obscura became an attractive entertainment” in the 19<sup>th</sup> century, being built in “gardens, parks and at holiday resorts” to provide pleasant visual spectacles about nature and the city. Nevertheless, Leonard’s choice of environment provides, on the one

<sup>14</sup> Leonard created six *camera obscura* installations: *St. Aporn Strasse 26*, at Gallery Gisela Capitain, Cologne (10<sup>th</sup> September-29<sup>th</sup> October 2011); *Arkwright Road* at Camden Arts Centre, London (31<sup>st</sup> March-24<sup>th</sup> June 2012); *Campo San Samuele, 3231* at Palazzo Grassi, Venice (30<sup>th</sup> August 2012-13<sup>th</sup> January 2013); *453 West 17th Street* at Gallery Murray Guy, New York (15<sup>th</sup> September-27<sup>th</sup> October 2012); *110 North Nevill Street* at Chinati’s Ice Plant, Marfa (15<sup>th</sup> December 2013-18<sup>th</sup> January 2015); *945 Madison Avenue* of *2014 Biennial* at Whitney Museum of American Art, New York (7<sup>th</sup> March-25<sup>th</sup> May 2014).

hand, an unattractive image in itself—such as highways—, and on the other, as American curator Matthew S. Witkowsky (2015, p. 109) notices, her works present a “radical reversibility”—that is, her installation “not only plays with perspectival conventions of foreground/focal plane versus background/dispersion, but also with oppositions of inside and outside and being alone/being together”. In the same manner, when describing his experience of Leonard’s work *453 West 17th Street* (2012) at Murray Guy gallery of Chelsea, American art historian George Baker points to the presence of another relational dimension. He proposes a twofold relation inherent to photography: one concerning the temporal relation between the space and the audience (and the temporal interaction between the audience members themselves), a second between the spectator and the photographic object. According to Baker (Baker, 2013a), “Leonard’s camera space now insisted on an undoing of the kinds of separation that camera space has long been understood to found, to need, and indeed to embody. Separation gave way to incorporation; distance and individuation to relationality, to indistinctness, to a fusion between subject and object, viewer and image, looking and feeling, body and photograph”. Thus, Leonard’s rooms restore an enclosed spectator, but their isolation is shared—their experience becomes collective.



Figure 6. Installation view of *2014 Biennial* (Whitney Museum of American Art, New York, March 7-May 25, 2014). Zoe Leonard, *945 Madison Avenue*, 2014. Photograph by Bill Orcutt. Artwork © Zoe Leonard. Courtesy the artist, Galerie Gisela Capitain, Cologne and Hauser & Wirth.

This relationality presents itself as a premise of photography, especially vernacular photography. In “boring images” (Batchen, 2008, p. 121) both in vernacular photography and in Leonard’s pieces, the spectator’s visions are not merely liked to formal appreciations but “give way to the experiences and affects”, intervening in “the subjective life the image takes on beyond its exposure and the material limits of the photographic print, a broadly psychic and carnal phenomenology provoked by photographic images” (Baker, 2013b). A simple visual approach would allow to awaken a connec-

tion to the social sphere of the technical image—as exchange and sharing. Similarly, American artist Matthew Buckingham, who has been using obsolete film projection apparatus since the late 1990s, recognizes a shared dimension to his installations: “the primary reason for working with the projected image is that it always implies some kind of social space” (Baker et al., 2002, p. 79). Through large filmic projections coexisting with the projector, Buckingham intervenes in the “viewing process by using the space, particularizing the space, so that the viewer sees herself not only in relation to the piece but also in relation to other viewers” (Baker et al., 2002, p. 79).

Artists that chose *camera obscura* to create large, dark and immersive environments with a projection spread over the walls, floor and ceiling, demonstrate their intention to be less concerned with representation, but rather provide a physical, conceptual, and relational experience to the spectator. The latter refers both to the intertwining presences between people, as well as to the relation that the field of photography established with its author and its users.

## 5. The projected image confuses real and fiction

Beyond meta-photographic discourse—as in Morrell—and immersive experience—as in Leonard—is another use of the *camera obscura* as room that occupies different aims within broader purpose of entertainment: the attempt to create a visual play between real and fiction. This dimension recalls part of the history of *camera obscura* related to the creation of perceptual illusion—an aspect taken rarely into account in historical discussions. French film historian Laurent Mannoni (2000, p. 10) deals with the illusory use of the *camera obscura*, in particular, by “quacks and tricksters”. Between the 16<sup>th</sup> and 17<sup>th</sup> centuries, illusion shows were presented in *camerae obscurae* as rooms to extort money from the audience. The projection was handled through mirrors and lenses to obtain images that “should appear outwardly, hanging in the Air”—as described by Neapolitan scientist Giambattista Della Porta (1658, p. 355) in his book *Natural Magick*. There are reports of this sort of entertainment as early as the 13<sup>th</sup> century: Valencian physician Arnauld de Villeneuve did not simply make a dark environment in which the spectator could enter and observe the outside world, but proposed images with actors playing war or homicides scenes—with some operators reproducing the sound and dialogue in the room (Hammond, 1981, p. 9). The *camera obscura* offered a hybrid spectacle: theatrical—for the play plots—and cinematographic—since the spectators saw the image projected on a fabric screen. As Della Porta (1658, p. 365) wrote: “the spectators that see not the sheet, will see the image hanging in the middle of the air, very clear, not without fear and terror, especially if the Artificer be ingenious”. Through these means, the spectator was proposed images “as if they were before his eyes, huntings, banquets, armies of enemies, plays, and all things else that one desires” (Della Porta, 1658, p. 364). This speculative entertainment gradually disappeared after the mid-17<sup>th</sup> century because, on the one hand, the tricks lost their mystery and, on the other, the complexity of the productions, as well as the luminous intensity needed to light the outside object, required detailed organization and large capital investment<sup>15</sup>.

<sup>15</sup> The entertainment dimension was also exercised by magic lanterns from the 17<sup>th</sup> onwards and by phantasmagoria shows that, from the mid-18<sup>th</sup> century, “generated amusing confusion” (Gunning, 2009, p. 30).

One can find in some contemporary *camera obscura* pieces a similar play between real and fiction, with one notable difference: past performances were primarily created outside to be viewed in the dark space, whereas in some current works, the projections reveal events belonging to hidden worlds. Della Porta indicated also this possibility by using not the outside reality, but a room adjacent to the *camera obscura*—solving lighting issues through torches, to create a projection of objects that “may be represented hanging in the middle of the chamber, that will terrify the beholders” (Della Porta, 1658, p. 365). Recent *camerae obscurae* by the artistic duo João Maria Gusmão and Pedro Paiva work in this way<sup>16</sup>. This duo worked together between 2000 and 2021. They used obsolete media such as 16mm film and organized in installations with sculpture and paintings to create an artistic dimension based on philosophical-literary research of “philosophical-poetic fictions” (Fundação EDP, 2017). Regarding the *camera obscura*, in a conversation on 18<sup>th</sup> November 2019, Gusmão refers to these pieces as an “inverted projection”. This denomination underlines the duo’s aim at an ambivalent meaning: on the one hand, it refers to the upside-down and left-to-right image of the optical phenomenon; on the other, the adjective “inverted” would seem to designate an inversion of the functionality—reality no longer enters the room, but the exact opposite happens, that is, an inside world is exteriorized. Thus, the *camera obscura* is not merely an optical phenomenon for observing reality, but rather a projection technique that provides an improbable and (de)constructed world, revealing the hidden, occult aspects of our sight<sup>17</sup>—a theme explored in the 16mm film projections made by the duo.

Their work *The Pendel* (2004), at Exposition center of Centro Cultural de Belém (Lisbon), provides an example (Fig. 7). A strange image is projected in a corridor: a swinging which, at first sight, looks like a metronome, turns out to be a moving pendulum. Its movement brings up clear parallels with cinema (Sardo, 2004, p. 38), objects and action focus on the real-time formation of the image and, simultaneously, on the time demanded of the spectator for understanding the projection of a pragmatically unreachable reality. At the top of the image there are two more elements: a wooden board and an anvil that together destabilize the physical principles—could the plank be broken simply by the weight of an anvil? Or is there an energy field

<sup>16</sup> Gusmão and Paiva have created thirteen artworks with the *camera obscura* since 2002. Listing below the works that will not be consider in this essay: *Without Title* in the exhibition *DeParamnésia*, at Palace Terceiras do Marquês, in Lisbon (12<sup>th</sup> - 30<sup>th</sup> October 2002); *The Solids Projector (or the Dream of a Rock)* in *Manifesta7*, at Ex Peterlini, in Rovereto (19 July - 2 November 2008); *Elephant* in *...as in all circumstances of life, and especially those that, not being anything in themselves, will become everything in the results* at Foundation Brodbeck, in Catania (22<sup>nd</sup> November 2011 - 21<sup>st</sup> January 2012); *Camera Inside Camera* in *The foot removes the sock which takes off the shoe which leaves the footprint...* at Sies + Höke Galerie in Düsseldorf (28<sup>th</sup> May - 14<sup>th</sup> August 2010); *Oven* in *There’s nothing more to tell because this is small, as is every fecundation*, at Museo Marino Marini, in Florence (13<sup>th</sup> November 2011 - 14<sup>th</sup> January 2012); *The Corner Edges of Objects Appear Rounded at Faraway Distances* In *Those animals that, at a distance, resemble flies*, at Kunsthhaus in Glarus (20<sup>th</sup> May - 19<sup>th</sup> August 2012); *Before Falling Asleep, a Pre-Cortical Image Inside a Moving Train in Papagaio*, at Hangar Bicocca, in Milan (12<sup>th</sup> June - 26<sup>th</sup> October 2014); and *Frozen Freezer* in *Os animais que ao longe parecem moscas* at Centro de Arte Oliva, in São João da Madeira (25<sup>th</sup> March - 21<sup>th</sup> April 2017).

<sup>17</sup> There is a certain functional indeterminacy in the artworks that mix the *camera obscura* and the magic lantern systems. To paraphrase German media theorist Friedrich Kittler (2010, p. 70), they could be understood as complementary: “the *lanterna magica* simply turns the *camera obscura* inside out. A hole in a wall once again separates inside and outside, system and environment. But in place of the sun [...] the *lanterna magica* employs an artificial light source” that illumining “a drawn and often colored pattern”, projects it “outside through the hole and onto a screen”.

between the anvil and the pendulum intervening on the wood (a quite stretchable material)? The oscillation questions the visual order through its pendular movement—continuously losing and (re)acquiring focus. *The Pendel* recovers the visual universe of the *camera obscura* used by “quacks and tricksters” to create illusion shows. Nonetheless, the duo’s intention is not to cheat the viewer to extort money but to think upon visual dimension, deconstructing and mixing the logic related to the *camera obscura* projective presentation.



Figure 7. Installation view of João Maria Gusmão + Pedro Paiva’s *The Pendel*, 2004. Installation, variable dimensions. Thanks to: EDP Foundation and Belém Cultural Centre \_ CCB, Lisbon.

Gusmão and Paiva create a dialectical tension of the image between reality and fiction—between the experience of known phenomena and the constitution of improbable physical orders. These dynamics result in the installation *Horizon of Events* (2008), at gallery of Torreão Nascente da Cordoaria Nacional of Lisbon. This piece contains several elements: a sculpture with a skull, the 16-mm film *Meteoritic*, and two *camerae obscurae*. One of the latter shows the optical phenomenon to the viewer in its entirety, since the object, a portion of wall, and the projection coexist in the same environment. Once the image takes form in real time, the spectator can com-

pare the object and its luminous representation. The unveiling function is accompanied by the parodic effect of the projection: a massive suspended rock with a piece of cord hanging from the bottom transmutes, through the projection, into a rock on the ground with the gravity-defying cord now standing upright on top. The second *camera obscura* shows another immobile stone with the moving image of an identical copy projected onto it. Since the whole phenomenon is hidden, the visual result is observed in its contraposition between fixity and mobility: the overlapping of the moving projection and the object presents a continuous visual transformation, making it difficult to recognize the subject—only at the moment of their coincidence does the subject become intelligible. This dialectical relationship between immobile object and moving projection intervenes in both a temporal and an intellectual interstice, demonstrating the possible illusory capabilities of the *camera obscura*.

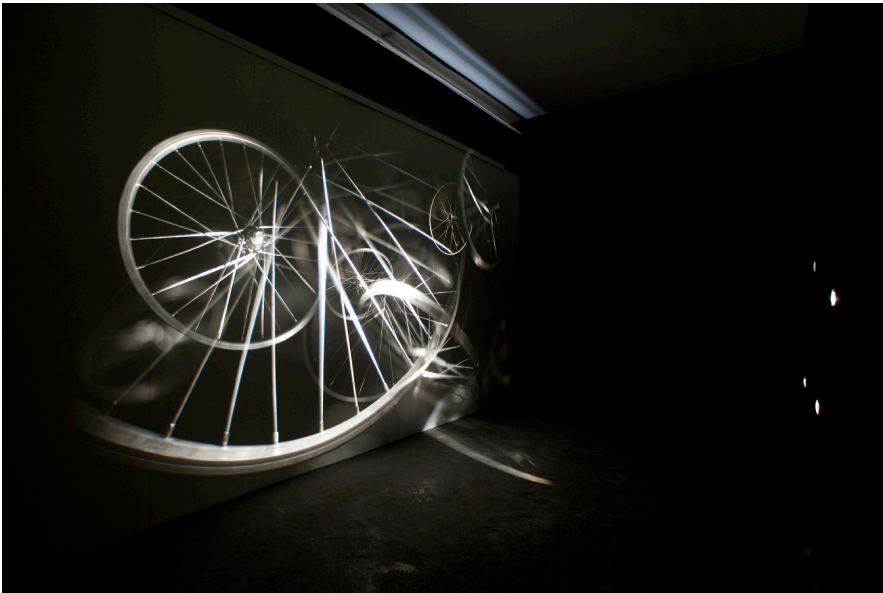


Figure 8. Installation view of João Maria Gusmão + Pedro Paiva's *Motion of Astronomical Bodies*, 2010. Installation, variable dimensions. Camera Obscura installation. 280 × 600 × 600 cm.

This overlapping process is re-elaborated in the pair's work *Motion of Astronomical Bodies* (2010), at Sies + Höke Galerie, in Düsseldorf (Fig. 8). The spectator enters a dark environment delimited by a wall with small four holes that project a two-dimensional image of moving wheels. Hidden from the spectator, the wheels are in constant rotation, lit up by a programmed DMX sequence. Thus, the projection is an image in continuous change, wherein each wheel is hardly separable. The image plays with the spectator's perception since the four holes do not correspond to the same number of rotating elements. In a conversation from 4<sup>th</sup> June 2020, Gusmão points out that the movement of the objects resembles clock gears, referring therefore to the time machine described by British writer Herbert George Wells in his novel *The Time Machine* (1895) and to Kepler's books on celestial bodies, written between the late 16<sup>th</sup> and early 17<sup>th</sup> centuries. Nonetheless, there are numer-

ous possible readings related to the artistic field in the 20<sup>th</sup> century: from the first readymade of French artist Marcel Duchamp from 1913 and the circular paintings of French painter Robert Delaunay in the 1930s, to the iconography of the film *Modern Times* by British actor Charlie Chaplin from 1936. Therefore, the spectator observes the continuous movement of the wheels, but the image is just a pretext and not the final aim. As the artists affirm, it is up to the spectator to “[realize] the deeper work of exegesis” (Frac Île-de-France, 2011). One can observe a visual similarity with entertainment and illusion regarding the multiplication of the image projection. In the 17<sup>th</sup> century, the Jesuit Marco Bettini described a projection composed of identifiable repetitions of an outside object, formed through multiple holes in the wall (Mannoni, 2000, p. 13).

Gusmão and Paiva’s *camera obscura* pieces thus question the movement of “continuous light”, that is, a luminous structure that is not mediated by technical devices—a film or slide projector—but in which light intervenes directly in the constitution of a moving image (De Tomasi & Grimaldi, 2022, p. 78). The duo expands the *a priori* characteristics of the phenomenon: movement within the projection had been an aspect traditionally omitted for artistic uses of the *camera obscura* until the 19<sup>th</sup> century, given that movement could be seen and experienced, but never represented. Gusmão and Paiva recover this aspect to challenge the visual dimension of the *camera obscura*. Their images are not two-dimensional transpositions of the outside world—rather mediations of micro-events that, far from providing a complex diegetic, build a photographic constellation, since they are based on minimal isolated or repeated movements of disjointed actions.

## 6. Conclusions

This research intended to bring to the discussion the recovery of the optical phenomenon of *camera obscura* through contemporary artistic practice. In the current digital era, where touch-screens, immersive reality and virtual have changed our relationship with the world, it is relevant to focus on artists that have recovered old fashioned and archaic photographic techniques. Thus, digital seems to advise us to rethink the future presenting as “zero degree”, that is to say using a “heuristic dispositive” (Elsaesser, 2006, 16-17) that questions ontological basis and practices of media like photography: “[a]s a zero degree, it is, necessarily, an imaginary or impossible place from which one speaks when examining either ‘the new’ or ‘the now’” (Elsaesser, 2006, 17). Contemporary *camerae obscurae* pieces are inscribed in this ambivalent area as an ancient process by bringing back to life the use of the digital. In this scenario, Media Archaeology investigation allows us to develop two approaches of this phenomenon. On the one hand, a temporal disjunction is revealed in the artistic pieces, that is, a non-evolutional, non-progressive vision of a medium—a network of ruptures, setbacks, and discontinuities coming from different historical moments, both past and present. On the other, this temporal network allows us to examine the *camera obscura* from a photographic point of view, through elements that expand beyond merely object photography.

The historical account quoted refers to the main recognized functions of the phenomenon, noting that the entertainment dimension, as well as the illusory and speculative, are usually marginalized by critics. Nevertheless, since the recovery of the



*camera obscura* in the 1990s, these dimensions participate in a reconfiguration of its use in artistic practice, since, at the same time, there are artists interested in using the phenomenon for producing images, while others address the *camera obscura* itself, its historical condition, and the expansion of its potential entertainment uses. The three paths—meta-photography, immersive installation, and playing between real and fiction—pointed should not be understood as restrictive and classificatory views, but rather as a first possibility of mapping the use of *camera obscura* in contemporary practice.

This research reveals also a dimension of obsolescence that has been a subject within art practice and criticism within recent decades. Through its recovery of past elements, often excluded or forgotten, the obsolete points to discursive possibilities that cross temporalities. As German film historian Thomas Elsaesser (2016, p. 346) states: obsolescence “understood as the survival of a witness to past ‘newness’ while renouncing past utility, can therefore also harbor utopian aspirations and even be the vehicle of lost promises and unfulfilled potential”. In photography, the obsolete discourse is revealed in the retrieval of old practices and techniques such as cyanotype, cameraless photography, daguerreotype, solarization, *Sabbatier* effect, among other, that complement digital technologies in a multifaceted and multitemporal artistic field.

If there is a tendency to recover the obsolete, as in the case of the *camera obscura* as room, contemporary artists do not develop it as a univocal, established, and defined medium. Even though some authors like German Thomas Bachler, English Nilu Izadi or French Alain Fleischer used this process to take photographs perpetuating the historical function of *camera obscura*, such as a remote predecessor to photographic cameras; on the contrary, the artists mentioned above reinvented a series of uses starting from hardly known histories and forgotten practices of photography—Abelardo Morell questions the relation between image and projection in photography, Zoe Leonard proposes immersive environments through a photographic relationship with the spectator, and, João Maria Gusmão and Pedro Paiva work on multilayer temporalities between real and fiction worlds.

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