Introduction

With the appearance of the first photograph, thanks to its versatility, and among many other novelties associated with this amazing discovery and invention, a new medium of communication was born, support for art, instrument for teaching or tool for the documentation of reality. Moreover, in the current technological revolution centred on the Internet and mobile devices, the multiple photographic manifestations have come to overcome the well-known quote by McLuhan in which he pointed out that "The medium is the message" giving rise to a visual mosaic and Virtual information, as part of digital communication, in which images have gained an unusual role in the so-called big data.

The aforementioned incessant production of images, both in professional and in popular photography, has overcome the original concept of the multiplicity of photography thanks to the photographic negative and the automatization of processes. Now, the ease of generating, copying and transmitting a digital image made us overcome the concept of unlimited copies and permanence of photography and, nowadays, we have to talk about a new concept, the ubiquity of the digital image. However, this era of greater photographic production is also the era of a great lack of knowledge by the society of audiovisual language in general and of photographic language in particular. Concepts such as depth of field, colour temperature or the rule of thirds, despite their presence and prominence within the visual world, are not generalist.

All these circumstances, together with the teaching vocation of the authors, give meaning to the publication of this book Basics of Photography and Aesthetics, but, likewise, they are not unique or exclusive. While thinking of a publication that, using the new technologies, could serve any university student who has, for the first time, access to the essence of the audiovisual language, it was also intended to be useful to any other possible reader that could be interested in photography. This is the reason why, while other projects linked and promoted by different instances of the CEU San Pablo University, where

the authors develop their work, we opted for an English edition with a clear commitment to internationalization and, in a way, a return to the origins of the studies of communication at CEU itself as it shows, among other objective indicators, the recent agreement signed with the Columbia University or the ground-breaking degree Digital Communication, first of its kind in Spain.

But, ultimately, the elaboration of this publication is only the consequence of a way of understanding photography in particular, and communication in general –origin of a clear vocation for this profession– that starts with curiosity and the capacity of astonishment by our surroundings. The legendary magazine Life explained, during the last century, this conception of the professional practice of communication from its editorial line: To see life; To see the world; to eyewitness great events [...] to see and take pleasure in seeing; to see and be amazed; to see and be instructed.

Miguel Ángel de Santiago Mateos

Publication Coordinator

Foreword

If sight is, as Ray Wright put it, the most developed sense we have as humans, it seems only reasonable to become more knowledgeable on how to correctly stimulate our eyes. The boom of information enhanced by the media world in the 20th century and exponentially boosted later on by the Internet has definitely made us enter a visual age. Sartori argued that, even before the turn of the millennium, in this new social environment the homo sapiens had been devoured by the *homo videns*, just as words had been displaced by images and new generations learnt how to look and decode images way before they learnt how to read.

The trick, though, is that the proliferation of new consumers who are better acquainted with pictures than letters does not necessarily entail that they are equally proficient when it comes to producing those visual messages or consciously aware of the implications of the images they receive. And it is here where we find that the new scenario not only involves an environmental change in terms of culture, but also requires –yet again, as so many other times in history– pedagogy to educate more aware consumers and more proficient –and, needless to say, ethical– producers of this new visual language the whole world speaks.

This handbook is a significant contribution on the part of this team of professional photographers and lecturers that have gathered to reflect on the indispensable features of their profession. The result is a stimulating invitation for students and/or future practitioners, but also for amateur photographers who want to articulate their loose knowledge on the field and, in general, to anyone who is interested in understanding the visual world that surrounds them.

Most of the contributors of the book come from CEU University in Madrid, Spain, which is not a minor matter. Before University studies were even an option in the country, the newspaper El Debate created in 1926 the reputed School of Journalism that would inspire, decades after, CEU University. Its

founder, Ángel Herrera Oria, who directed El Debate for 22 years, always defended a knowledgeable and responsible use of the mass media, and this spirit is still noticeable in both CEU's classes and the lessons in this book. The mix of humanism, technological innovation, internationalization –Herrera sent his journalists to Columbia University to study Journalism, and CEU's students can still benefit from this nowadays–, and the aspiration to always perform as professionally as possible are easily found in this book. Thus, one cannot think of a better tribute to their inspirer than this.

The book provides both insights on the concept of visual representation itself and the parallelisms with the human eye, and more specific disquisitions on the different parts of the camera and how the photographers' choices condition the semantic result of the works they produce. Its agile writing makes it also an easy to digest reading that does not renounce, though, to deepen into more elaborate thoughts when necessary. By the end of the book, the reader will have obtained many answers, some more questions, and, more importantly, will have been empowered with more aware brains and eyes to face their world.

Roberto Gelado Marcos

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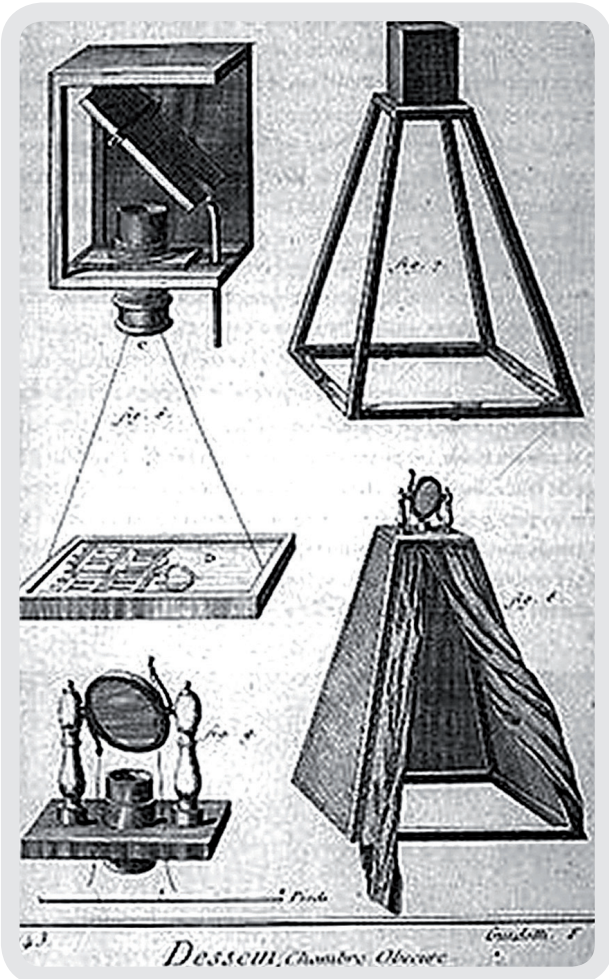
Image Making

Miguel Á. de Santiago Mateos

Introduction

Before photography, no other reliable system of accurately representing reality was able to offer the same results as a camera from the moment it appeared. While it is true that other types of similar expressions, natural or artistic, imitating what was perceived by our senses was achieved more or less successfully, a series of limitations prevented a higher level of accuracy: the fleeting nature of an image formed in the mirror, the interpretation of reality made by a painter when painting a canvas, etc. In this sense, in order to understand the qualitative step the invention of photography meant, one must begin with the formation of the image in the camera obscura; as, ultimately, it represents the factor that makes the difference, a permanent link with the reality that it captures and represents, with qualities not surpassed to date (Casajús, 1998 and López, 1997).

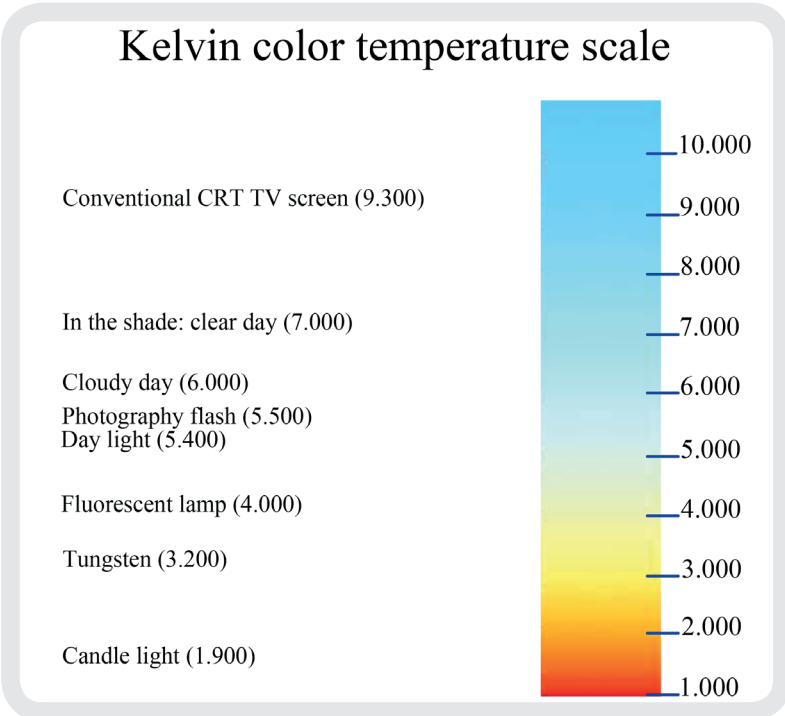
In the words of Langford, to impress upon a film an event or a place is already an acceptable way to validate our experience and share it with others. The camera can take us to places and provide us with visual sensations located beyond our demonstrable experience" (Langford, 1982).



Scheme of a 18th century camera obscura. Source: Diderot and D'Alembert, Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers.

1. Writing with Light

Etymologically, the term photography means to record by means of light and, without this raw material, it is impossible, as reported by some authors and emphasizing certain poetic nuances in the roots of the word, to compose with light. In conclusion, the light that reaches our photosensitive material will be what forms –as a final result– the image of reality that is represented as part of a process in which the camera obscura becomes an unavoidable protagonist. The camera is, after all, a dark room in which images of a daily nature are reproduced and immortalised quite accurately, and which, then, become part of a kind of collective visual environment parallel to reality (Freund: 1974 and Sontag: 1990).



Color Temperature: way of defining, in Kelvin scale, the color of a source of light. Image: own production.

In this regard, even though this close approach to the photographic phenomenon is insufficient to define this new invention that changed visual mass communication, it is necessary to know certain characteristics of photography's raw material; that is, light. Michael Langford emphasizes the importance of light in photography and defines it as a ray of energy that radiates from the sun or another source; and, in addition, this author points out four characteristics that affect this ray of energy: the fact that it moves in the form of waves, whose different wavelengths give our eyes different colour sensations; that it travels in a straight line; that it travels at a high speed (300,000 kilometres per second in space) or, lastly, that light behaves as if it was formed by particles of energy, which produces chemical changes (Langford, 2004).

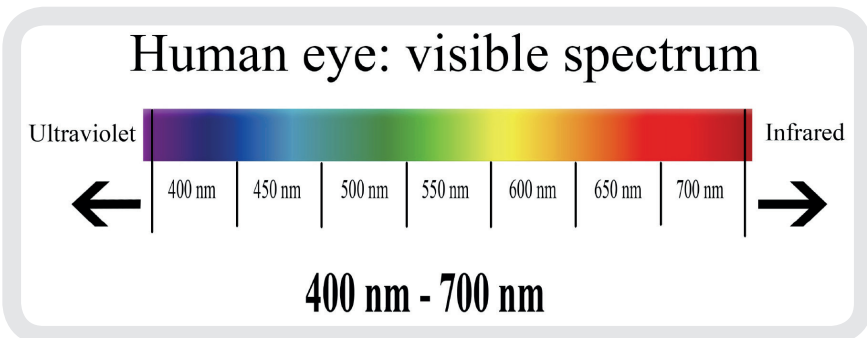
Nonetheless, light being a part of a range of electromagnetic radiation, the human eye is only sensitive to a limited space between a wavelength of between 400 nanometres[1] and 700 nm. This space is called the visible spectrum.

[1] A nanometre, represented by the symbol nm, is a unit of length in the metric system, equal to one billionth of a metre (0.000000001 m) or, said differently, one millionth of a millimetre.

Langford highlights this detail and points out that when a mixture of all visible wavelengths is produced, the light is white and colourless and acquires colour according to specific wavelengths: violet or dark purple with wavelengths between 400 nm and 450 nm; blue between 450 nm and 500 nm; blue-green between 500 nm and 580 nm; yellow between 580 nm and 600 nm; orange between 600 nm and 650 nm; red between 650 nm and 700 nm. In addition, beyond the visible spectrum, the longitudinal bands surpass the indicated space, namely, ultraviolet or infrared (Langford, 2004).

The characteristics of light as well as those of wavelength and colour could be emphasised further, but, nevertheless, for this purpose refer to other publications that address lighting more specifically.

However, it should be noted that, in order to photograph in the best way possible, we have to be familiar with the difference between direct and diffuse light; how light is reflected; how it acts on opaque, transparent or translucent materials; intensity or its distance, among other aspects. In fact, all of these conditions, combining various light sources differently configured, are those that have to be taken into consideration in photography studio, and which in turn constitute one of the main factors that intervene in visual narration as part of a photographic production.



Visible Spectrum. Image: own production.

2. The Camera Obscura

The camera obscura is esteemed by all researchers to be the soul of photography, and as aforementioned, its link with reality as its first feature is noted; this circumstance has been the main source of both its strengths and its limitations. The reason why the link mentioned above preferably stands out is none other than the result of the formation of an image of reality, in a properly

conditioned environment, as a result of a natural process that gives the photographic process a non-existent credibility in any other system of representing reality (Sontag: 1990).

Based on the fact that any scene will reflect light and that, likewise, by recreating certain conditions in the phenomenon of the camera obscura, we manage to reproduce and isolate pieces of reality.

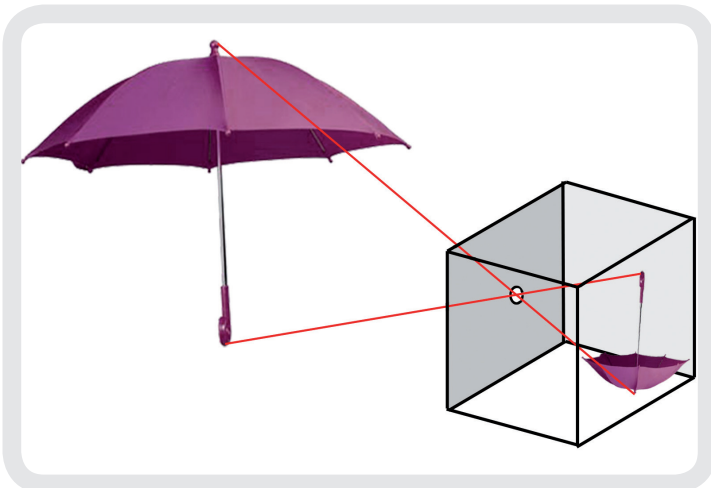
Illustration that shows the use of a Camera Lucida (1807), patented by William Hyde Wollaston in 1806. It was created as a tool to help in the drawing process.

Langford defines the process of forming images in the camera obscura like this: If the light of a very bright scene enters a room or a dark box through a small hole, an image of it will be formed on the surface facing the hole. This occurs because the light of the top can only reach the bottom of the receiving surface through the hole, and vice versa. There is a lack of sharpness because the light rays do not focus, but converge in a small beam the size of the hole (Langford, 1982).

One way to approach the invention of photography can begin with the making of a photographic camera. These cameras, called pinhole cameras, are camera obscuras to which optics have not been applied, and which collect the essence of photography in its most pure and romantic form. The final image, however, will have all of its own limitations of a rudimentary system together with the details that are a result of the natural formation of the image. The characteristics that give rise to current photographic cameras are the utilization of different photosensitive materials up to the digital sensors of today; the possibility of resorting to a variable diameter of a round hole by which light enters through the opening of the diaphragm; being able to control time of exposure due to the shutter curtains; the domain of artificial lighting, using flash; the use of autofocus; the reduction of dimensions and the major ergonomics of cameras, or even, currently, the possibility of recording professional quality video. However, in times to which we refer, the invention of the first photograph was not to happen for years –the camera obscura itself was not enough–.

3. The Invention of Photography

Once the process of obtaining recreated faithful images of reality was discovered, the logical aspiration will be to capture those scenes for posterity. In this regard, all researchers note that this process is achieved from a chemical aspect and that, at the same time, to optically improve the poor quality of the images that almost magically appeared in the camera obscura is the aim (Sougez, 1994 and Newhall, 1982). Discovery-invention would be what Gerardo F. Kurzt (Kurtz, 2001) used to reference, both, the natural phenomenon and the intervention, often empirical, of man.



Camera Obscura effect. Image: own production.

Therefore, when in 1826, Joseph-Nicéphore Niépce (1765-1833) managed to take the first known photograph of the view from the estate of Le Gras, an almost unimaginable dream became true; that is, a more or less automatic process, able to accurately reflect reality. Immortalizing the fleeting reality that had been previously studied in the camera obscura was achieved; and that, after many achievements, will be given the term "photography", which the dictionary of the Spanish Royal Academy defines as: "The art of focusing and reproducing by means of chemical reactions, on suitably prepared surfaces, the images reflected in the back of a camera obscura" (RAE, 2001: 732). From the appearance of this new phenomenon the way to visually understand the world around us changes, and the precedent of visual mass communication, as it is known today, was established.

First photograph known. View from Joseph-Nicéphore Niépce's country house at Le Gras (1826).

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